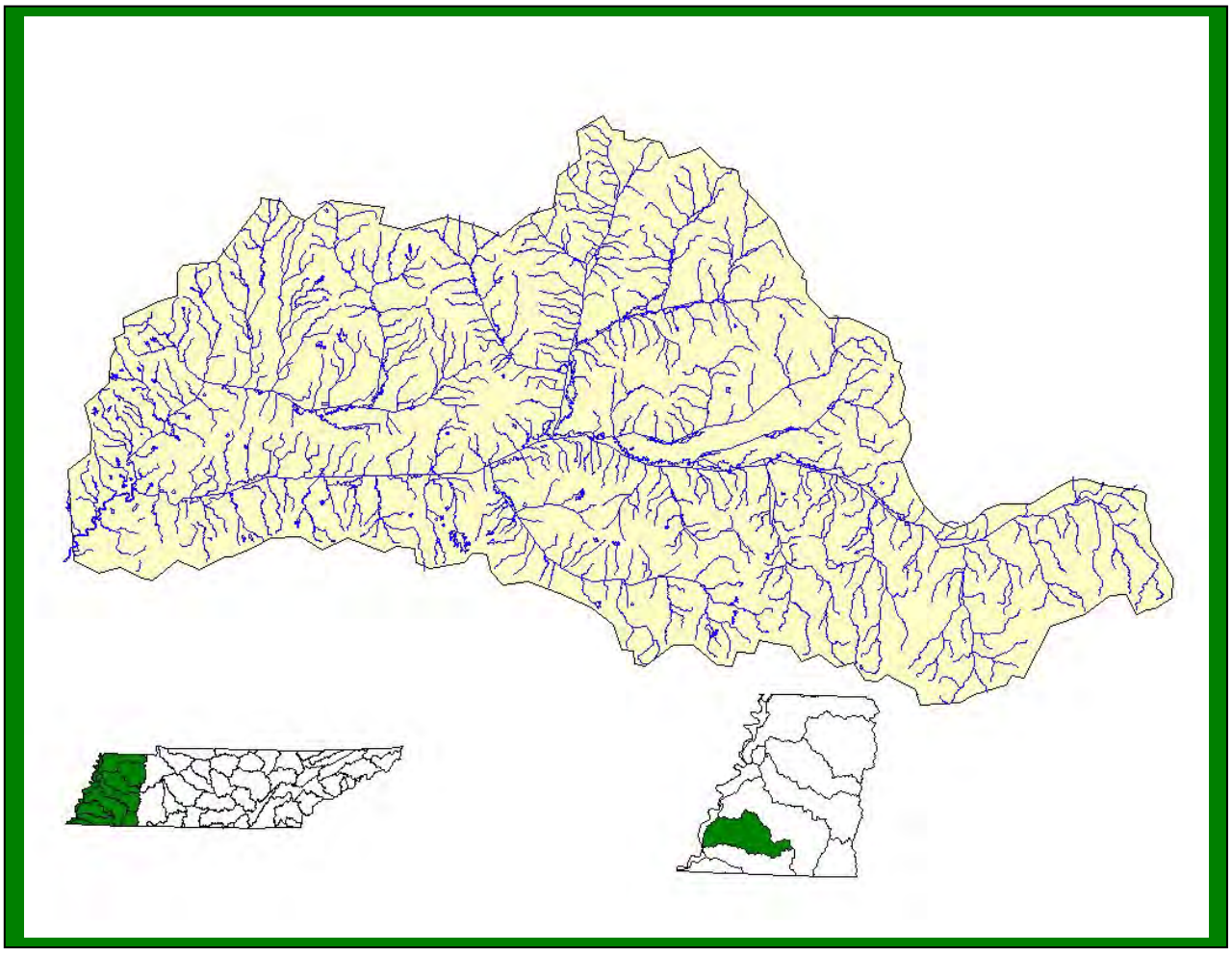
LOOSAHATCHIE RIVER WATERSHED (08010209) OF THE MISSISSIPPI RIVER BASIN

WATERSHED WATER QUALITY MANAGEMENT PLAN



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
WATERSHED MANAGEMENT SECTION
2003

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

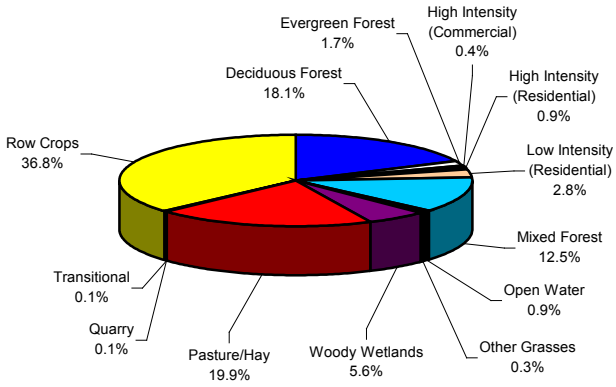
Summary – Loosahatchie River

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 Loosahatchie 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.

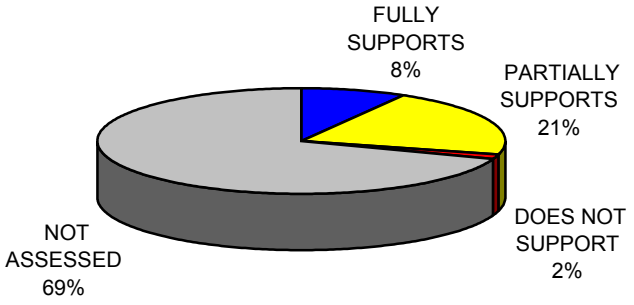
A detailed description of the watershed can be found in Chapter 2. The Loosahatchie River Watershed is approximately 738 square miles and includes parts of five West Tennessee counties. A part of the Mississippi River drainage basin, the watershed has 1,443 stream miles and 81 lake acres.



Land Use in the Loosahatchie River Watershed is based on MRLC Satellite Imagery.

One interpretive area is located in the watershed. Seventeen rare plant and animal species have been documented in the watershed, including one rare fish species.

A review of water quality sampling and assessment is presented in Chapter 3. Using the Watershed Approach to Water Quality, 16 sampling sites were utilized in the Loosahatchie River Watershed. These were ambient or watershed monitoring sites. Monitoring results support the conclusion that 8% of total stream miles (based on RF3) fully support designated uses.



Water Quality Assessment in the Loosahatchie River Watershed is Based on the 1998 303(d) List.

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 (pollutants) such as Organic Enrichment/Low Dissolved Oxygen, Pathogens, Habitat Alteration and Siltation.

Point and Nonpoint Sources are addressed in Chapter 4, which is organized by HUC-10 subwatersheds. Maps illustrating the locations of STORET monitoring sites and USGS stream gauging stations are presented in each subwatershed.

HUC-10 Subwatersheds in the Loosahatchie River Watershed.

Point source contributions to the Loosahatchie River Watershed consist of 16 individual NPDES-permitted facilities, eight of which discharge into streams that have been listed on the 1998 303(d) list. Other point source permits in the watershed are Aquatic Resource Alteration Permits (10), Tennessee Multi-Sector Permits (30), Mining Permits (8) and Concentrated Animal Feeding Operation Permits (1). Agricultural operations include cattle, chicken, hog, and sheep farming. Maps illustrating the locations of NPDES and ARAP permit sites are presented in each subwatershed.

Chapter 5 is entitled *Water Quality Partnerships in the Loosahatchie 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. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Geological Survey), and state agencies (TDEC Division of Community Assistance, TDEC Division of Water Supply, and Tennessee Department of Agriculture) are summarized.

Point and Nonpoint source approaches to water quality problems in the Loosahatchie River Watershed are addressed in Chapter 6. Chapter 6 also includes comments received during public meetings, along with an assessment of needs for the watershed.

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

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.

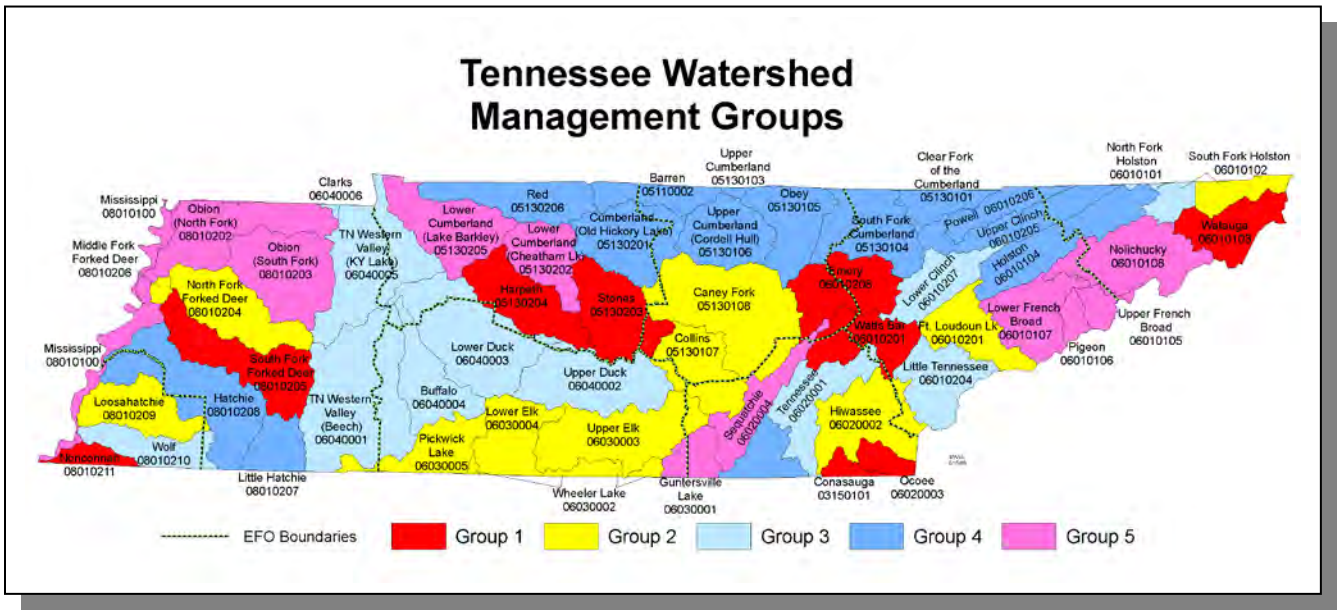


Figure 1-1. Watershed Groups in Tennessee's Watershed Approach to Water Quality.

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.

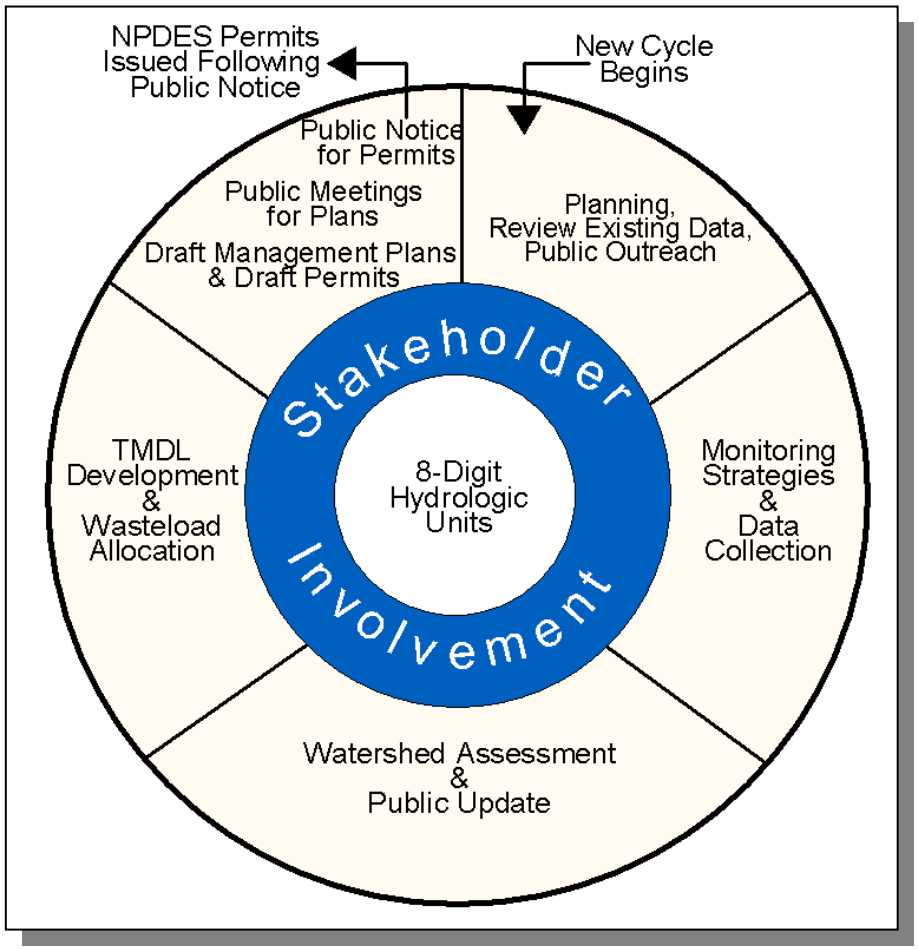


Figure 1-2. The Watershed Approach Cycle.

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 LOOSAHATCHIE RIVER WATERSHED

2.1. BACKGROUND. "Hatchie" is a Native American word meaning "river". The Loosahatchie River was recognized as a dark river flowing through a swamp.

The Loosahatchie River watershed streams have increased gradient, generally sandy substrates, and distinctive faunal characteristics for west Tennessee. Smaller streams of the Bluff Hills have localized reaches of increased gradient and small areas of gravel substrate that create aquatic habitats that are distinct from those to the east. Unique, isolated fish assemblages more typical of upland habitats can be found in these stream reaches. The river system has wide floodplains and many streams have been channelized.

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

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Loosahatchie River Watershed is located in West Tennessee and includes parts of Fayette, Hardeman, Haywood, Shelby, and Tipton Counties.

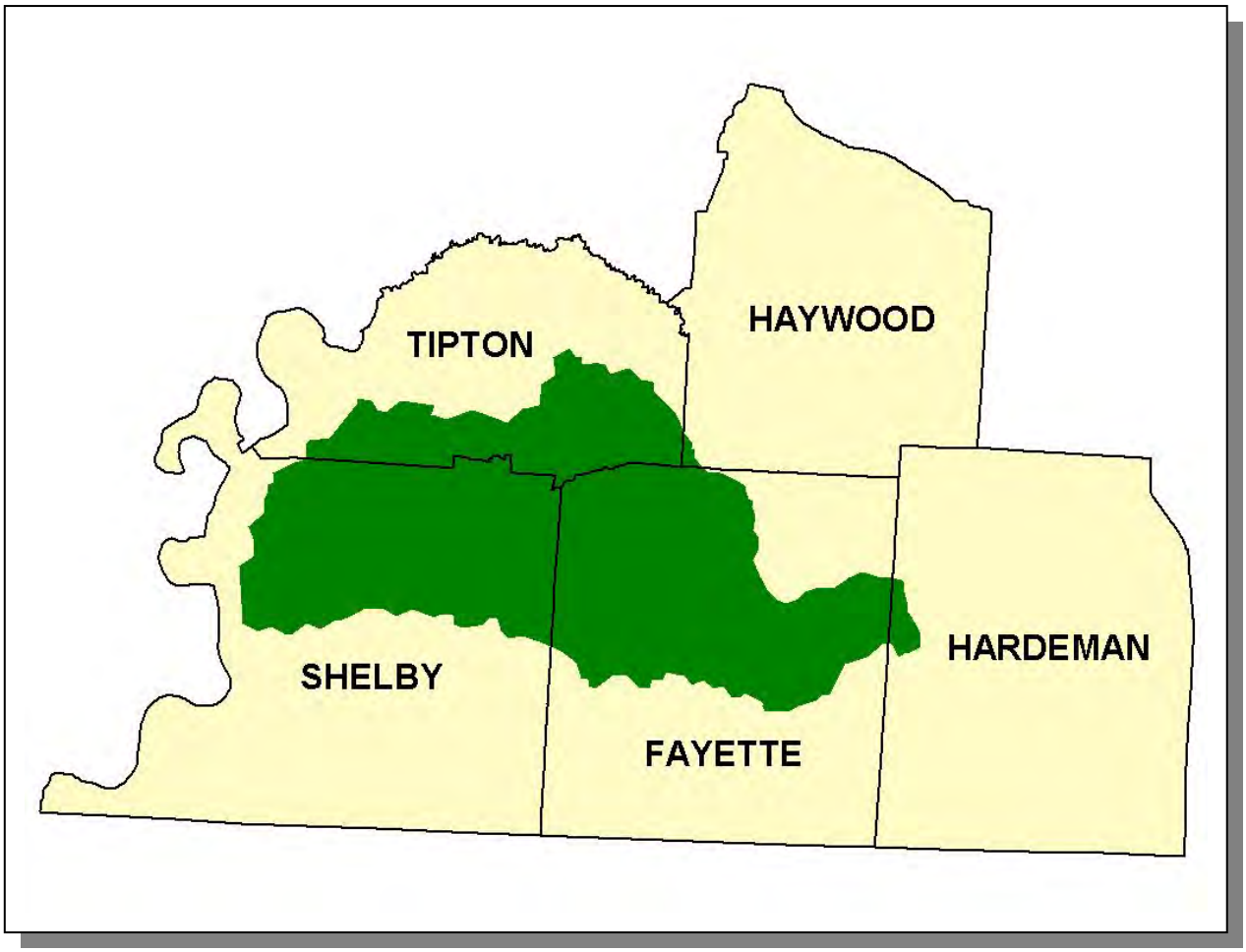


Figure 2-1. General Location of the Loosahatchie River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Fayette	40.9
Shelby	39.1
Tipton	18.6
Hardeman	1.1
Haywood	0.3

Table 2-1. The Loosahatchie River Watershed Includes Parts of Five West Tennessee Counties.

2.2.B. Population Density Centers. One interstate (I-40) and three state highways serve the major communities in the Loosahatchie River Watershed.

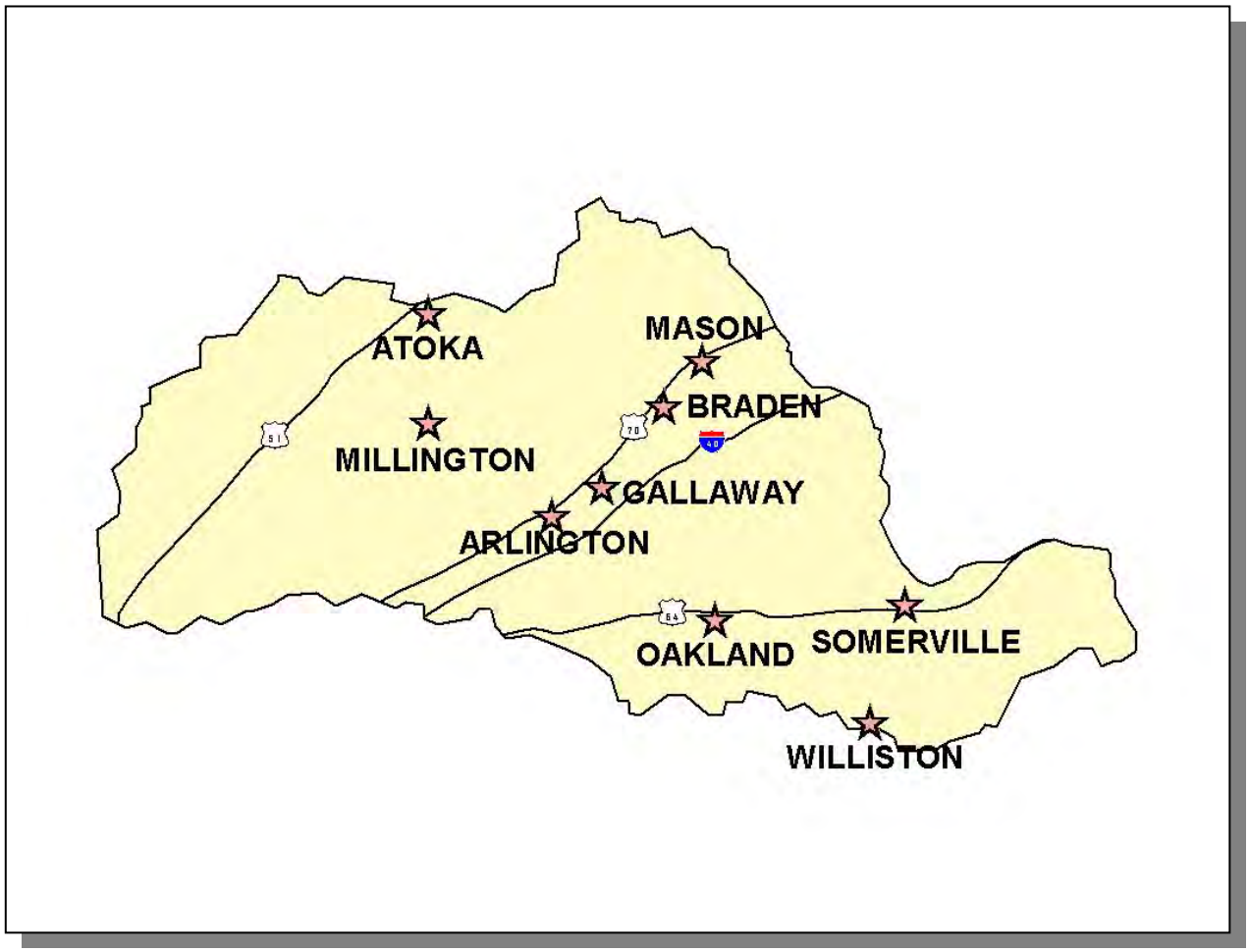


Figure 2-2. Municipalities and Roads in the Loosahatchie River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Atoka	2,099	Tipton
Arlington	1,414	Shelby
Braden	335	Fayette
Gallaway	841	Fayette
Mason	329	Tipton
Millington	18,142	Shelby
Oakland	428	Fayette
Somerville*	1,881	Fayette
Williston	403	Fayette

Table 2-2. Municipalities in the Loosahatchie River Watershed. *Population based on 1996 census (Tennessee Blue Book). Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Loosahatchie River Watershed, designated the Hydrologic Unit Code 08010209 by the USGS, is approximately 738 square miles and drains to the Mississippi River.

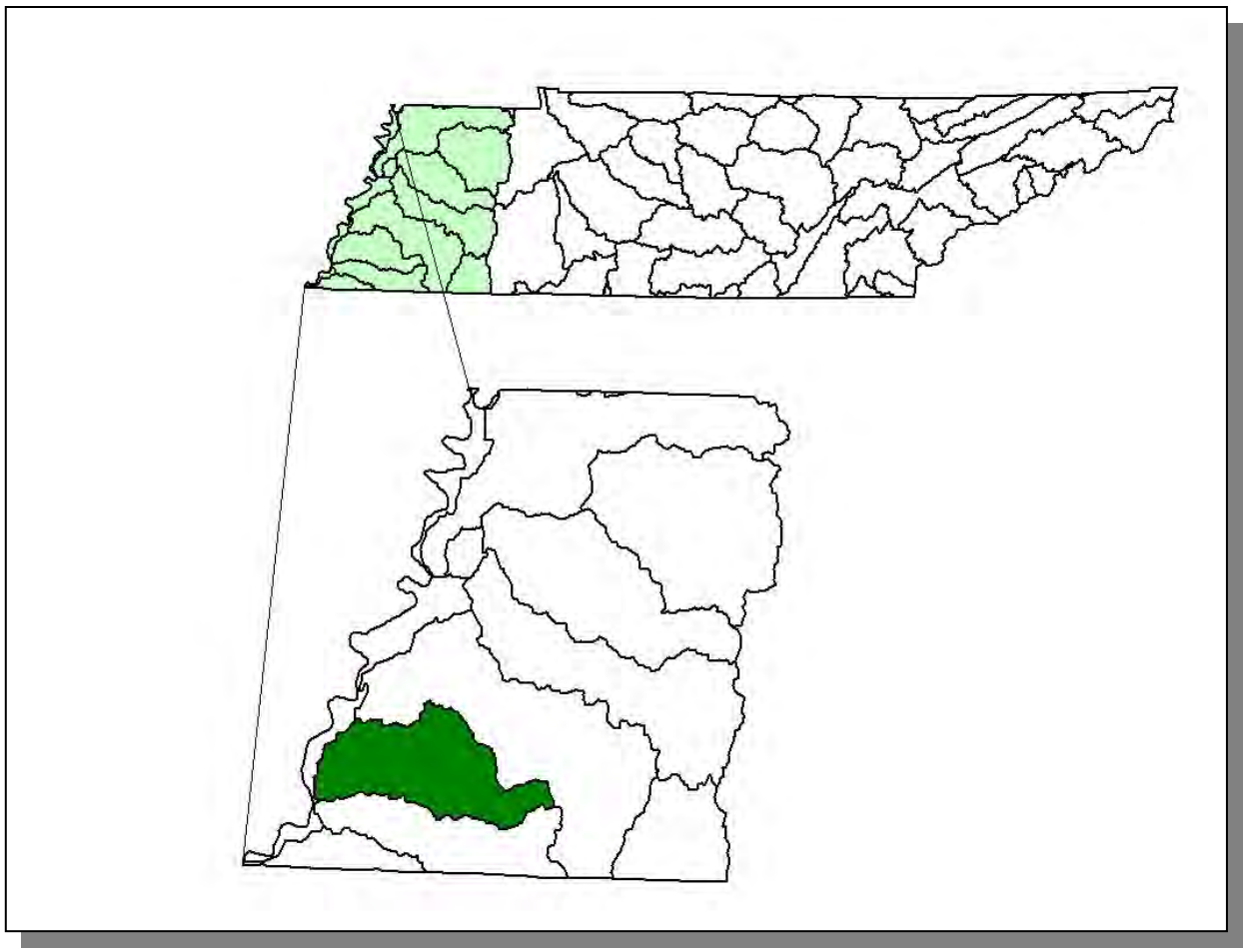


Figure 2-3. The Loosahatchie River Watershed is Part of the Mississippi River Basin.

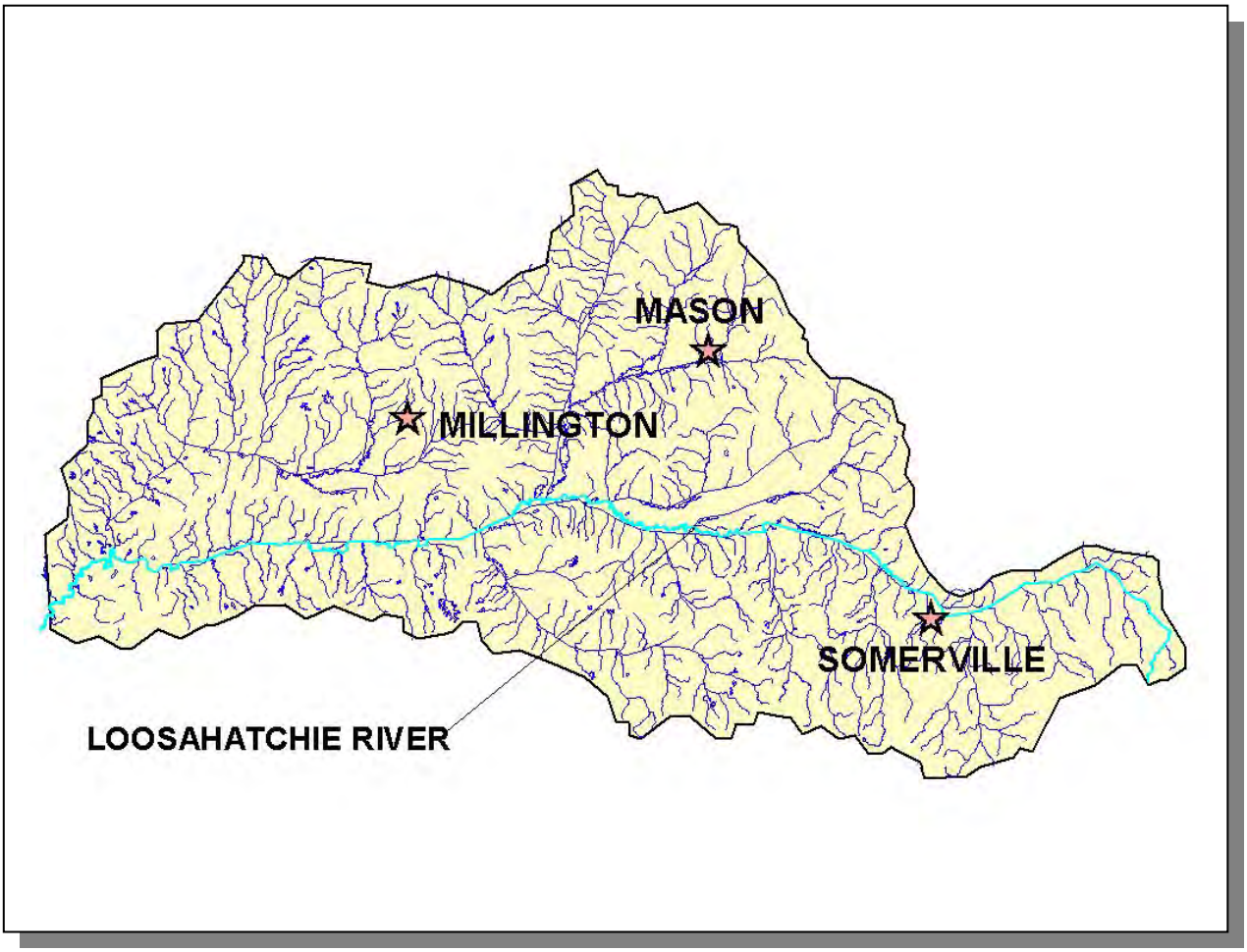


Figure 2-4. Hydrology in the Loosahatchie River Watershed. *There are 1,443 stream miles and 81 lake acres recorded in River Reach File 3 in the Loosahatchie River Watershed. Locations of Loosahatchie River and the cities of Mason, Millington, and Somerville are shown for reference.*

2.3.B. Dams. There are 53 dams inventoried by TDEC Division of Water Supply in the Loosahatchie River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

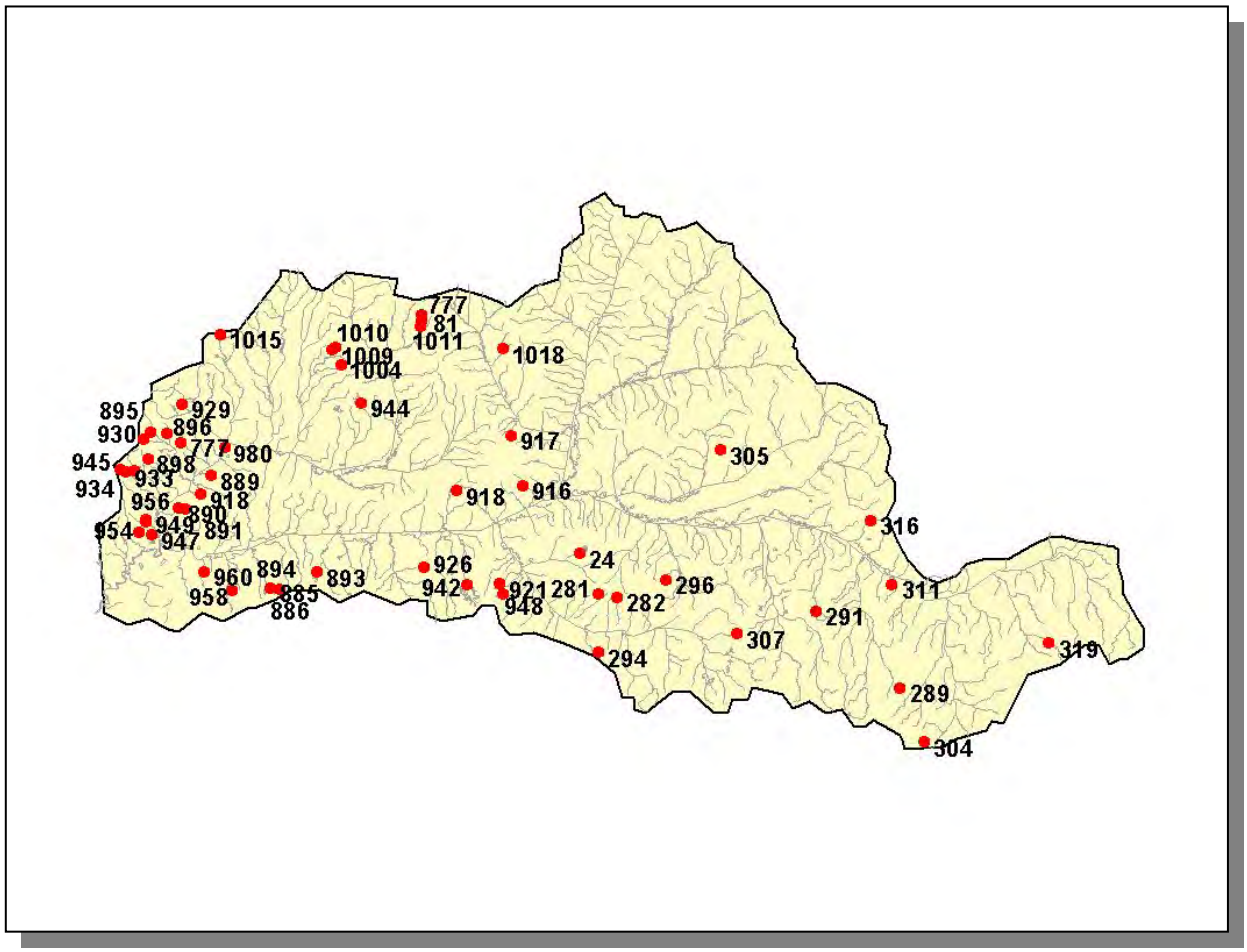


Figure 2-5. Location of Inventoried Dams in the Loosahatchie River Watershed. *More information is provided in Loosahatchie-Appendix II and on the TDEC homepage at: http://gwidc.gwi.memphis.edu/website/dams/viewer.htm*

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.

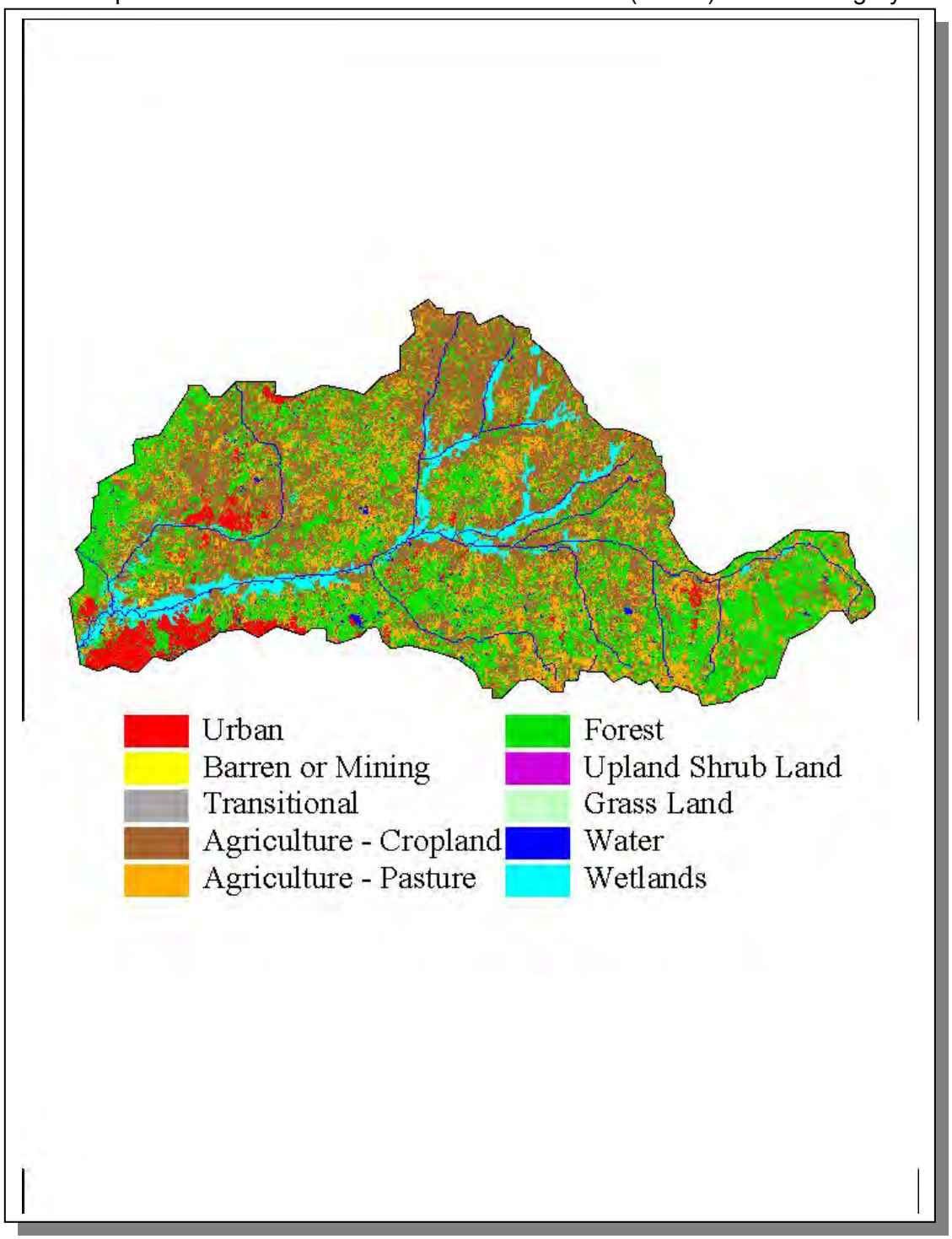


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

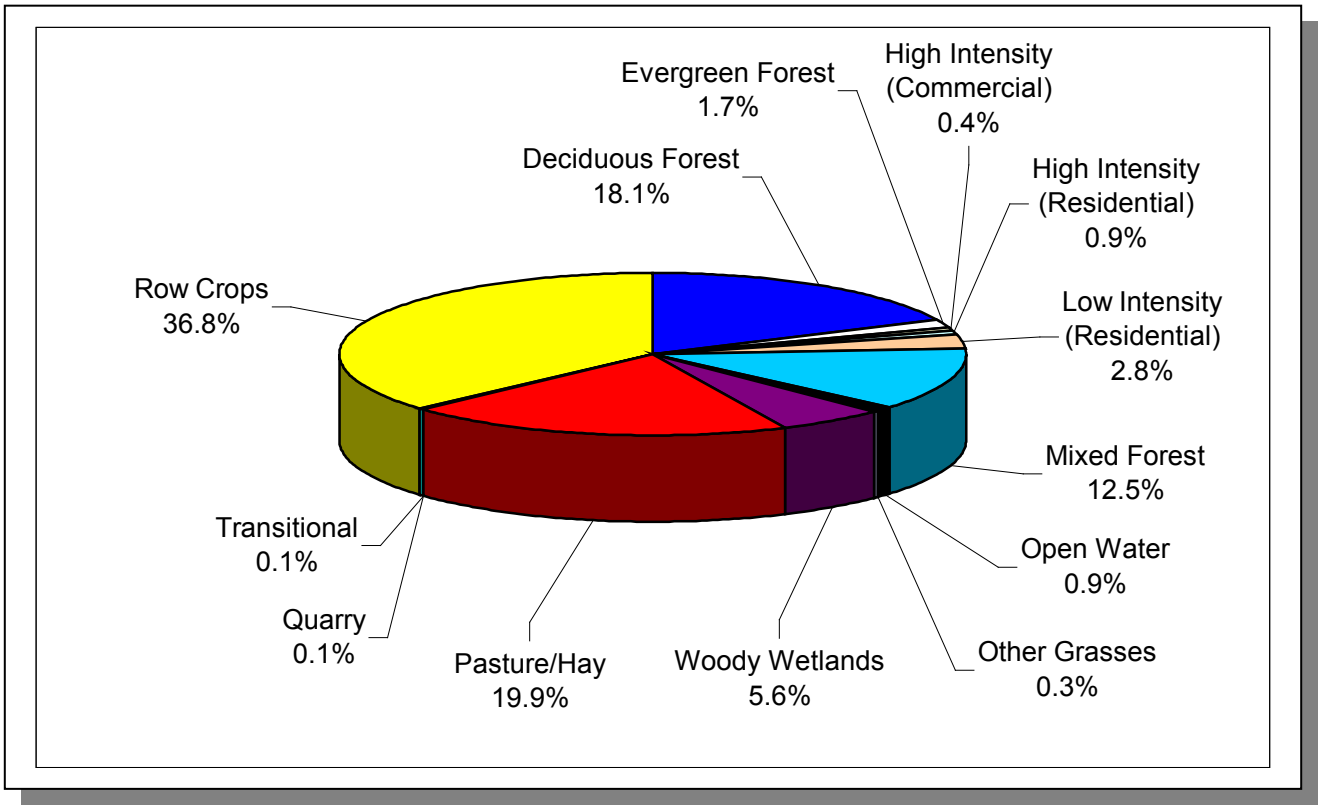


Figure 2-7. Land Use Distribution in the Loosahatchie River Watershed. *More information is provided in Loosahatchie-Appendix II.*

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are defined as 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 include 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 Loosahatchie River Watershed lies within 3 Level III ecoregion (Southeastern Plains, Mississippi Alluvial Plain, and Mississippi Valley Loess Plains) and contains 4 Level IV subecoregions (Griffen, Omernik, Azavedo, 1997):

- The Southeastern Plains and Hills (65e) contain several north-south trending bands of sand and clay formations. Tertiary-age sand, clay, and lignite are to the west, and Cretaceous-age fine sand, fossiliferous micaceous sand, and silty clays are to the east. With elevations reaching over 650 feet, and more rolling topography and more relief than the Loess Plains (74b) to the west, streams have increased gradient, generall sandy substrates, and distinctive faunal characteristics for west Tennessee. The natural vegetation type is oak-hickory forest, grading into oak-hickory-pine to the south.

- The Northern Mississippi Alluvial Plain (73a) within Tennessee is a relatively flat region of Quaternary alluvial deposits of sand, silt, clay, and gravel. It is bounded distinctly on the east by the Bluff Hills (74a), and on the west by the Mississippi River. Average elevations are 200-300 feet with little relief. Most of the region is in cropland, with some areas of deciduous forest. Soybeans, cotton, corn, sorghum, and vegetables are the main crops. The natural vegetation consists of Southern floodplain forest (oak, tupelo, bald cypress). The two main distinctions in the Tennessee portion of the ecoregion are between areas of loamy, silty, and sandy soils with better drainage, and areas of more clayey soils of poor drainage that may contain wooded swamp-land and oxbow lakes. Waterfowl, raptors, and migratory songbirds are relatively abundant in the region.

- The Bluff Hills (74a) consist of sand, clay, silt, and lignite, and are capped by looess greater than 60 feet deep. The disjunct region in Tennessee encompasses those thick loess areas that are generally the steepest, most dissected, and forested. The carved loess has a mosaic of microenvironments, including dry slopes and ridges, moist slopes, ravines, bottomland areas, and small cypress swamps. While oak-hickory is the general forest type, some of the undisturbed bluff vegetation is rich in mesophytes, such as beech and sugar maple, with similarities to hardwood forests of eastern Tennessee. Smaller streams of the Bluff Hills have localized reaches of increased gradient and small areas of gravel substrate that create aquatic habitats that are distinct from those of the Loess Plains (74b) to the east. Unique, isolated fish assemblages more typical of upland habitats can be found in these stream reaches. Gravels are also exposed in places at the base of the bluffs.

- The Loess Plains (74b) are gently rolling, irregular plains, 250-500 feet in elevation, with loess up to 50 feet thick. The region is a productive agricultural area of soybeans, cotton, corn, milo, and sorghum crops, along with livestock and poultry. Soil erosion can be a problem on the steeper, upland Alfisol soils; bottom soils are mostly silty Entisols. Oak-hickory and southern floodplain forests are the natural vegetation types, although most of the forest cover has been removed for cropland. Some less-disturbed bottomland forest and cypress-gum swamp habitats still remain. Several large river systems with wide floodplains, the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf, cross the region. Streams are low-gradient and murky with silt and sand bottoms, and most have been channelized.

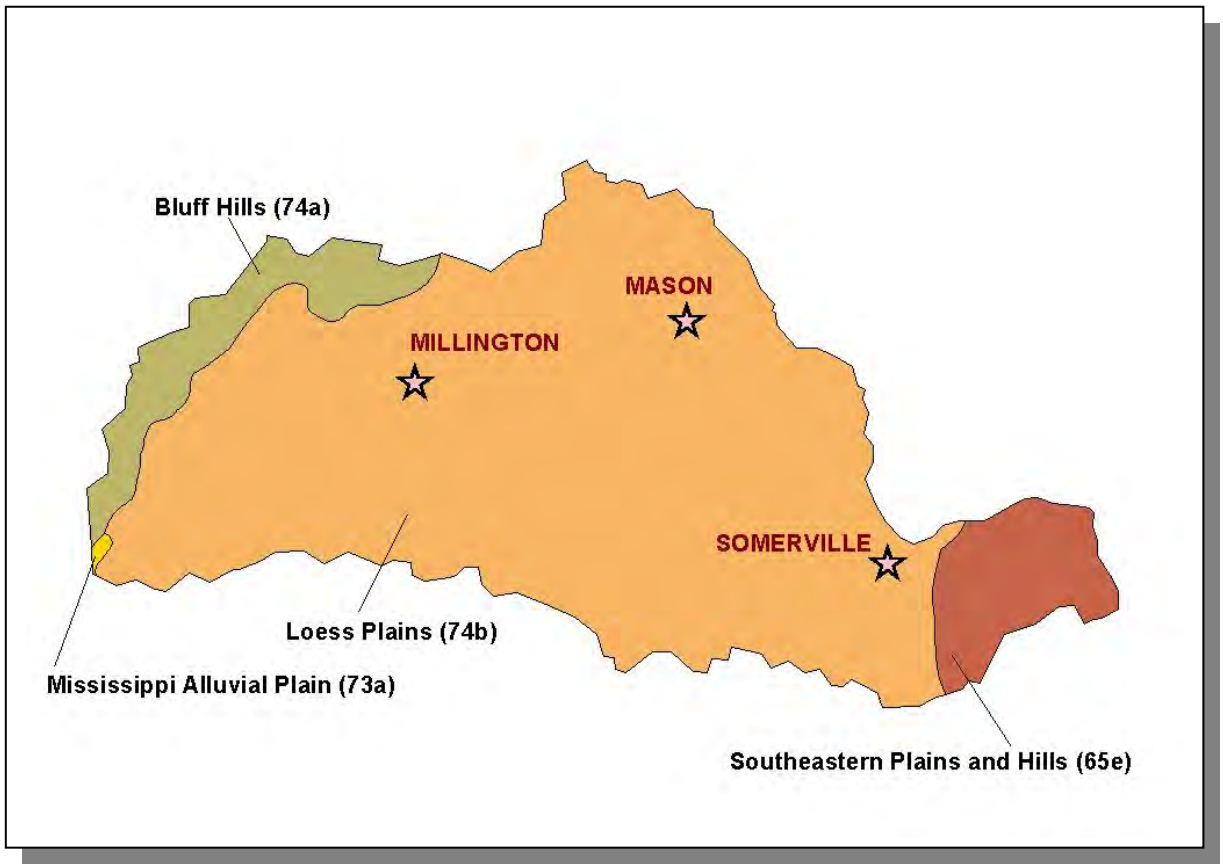


Figure 2-8. Level IV Ecoregions in the Loosahatchie River Watershed. *Locations of Mason, Millington, and Somerville are shown for reference.*

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.

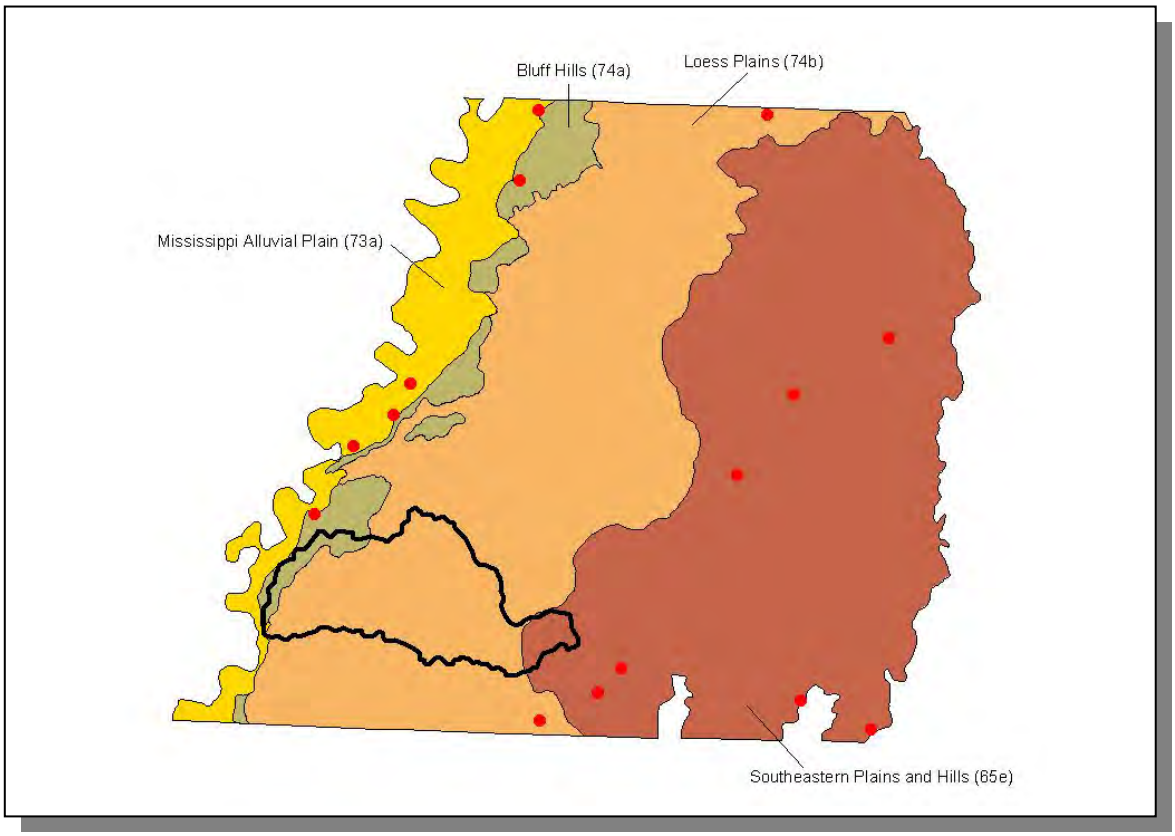


Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 65e, 73a, 74a, and 74b. *The Loosahatchie River Watershed is shown for reference. More information is provided in Loosahatchie- Appendix II.*

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
Crustaceans	0
Insects	0
Mussels	0
Snails	0
Amphibians	1
Birds	3
Fish	1
Mammals	4
Reptiles	2
Plants	6
Total	**17**

Table 2-3. There are 17 Rare Plant and Animal Species in the Loosahatchie River Watershed.

In the Loosahatchie River Watershed, there is one rare fish species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Noturus stigmosus	Northern madtom	MC	D

Table 2-4. Rare Aquatic Species in the Loosahatchie River Watershed. *Federal Status: E, Listed Endangered by the U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency; MC, Management Concern for the U.S. Fish and Wildlife Service. More information may be found at http://www.state.tn.us/environment/nh/tnanimal.html.*

2.6.B. Wetlands. The Division of Natural Heritage 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/epo/wetlands/strategy.zip.

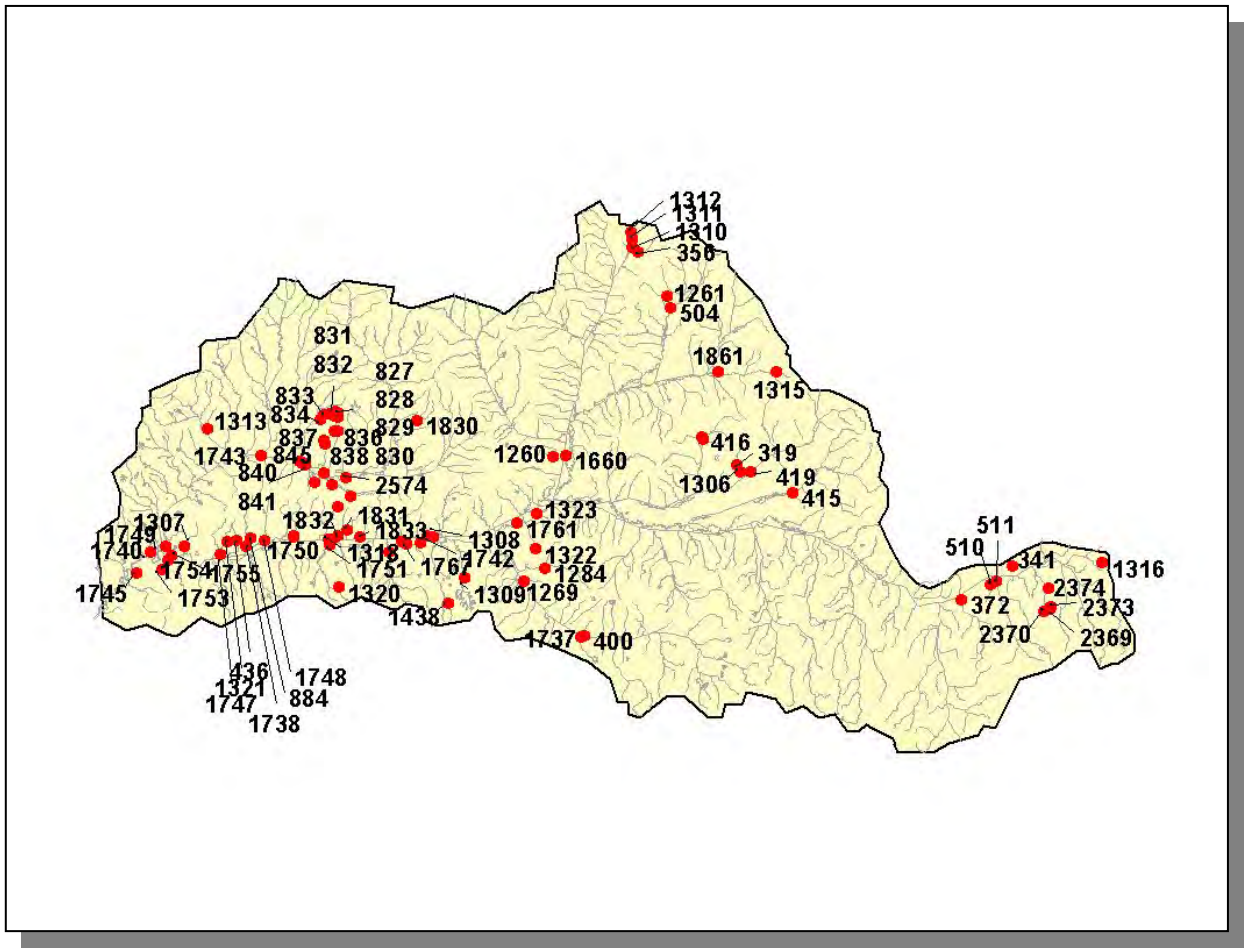


Figure 2-10. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Loosahatchie River Watershed. ***This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands*** *in the watershed. More information is provided in Loosahatchie-Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Interpretive Areas. Some sites representative of the cultural heritage are under state or federal protection:

- Meeman-Shelby Forest State park and Wildlife Management Area, a 13,467 acre park with a bottomland hardwood forest of large oak, cypress, and tupelo. The park contains 2 lakes and miles of hiking trails. Deer, turkey, and 200 species of birds are abundant.

In addition, many local interpretive areas are common, most notably, Aycock City park in Millington and Munford City Park in Munford.

2.8. 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
Bear Creek	4			Jokes Creek	3		
Beaver Creek Canal	4			Laurel Creek Drainage Canal	4		
Bennett's Creek	3			Little Cypress Creek Canal	4		
Big Creek Drainage Canal	4			Loosahatchie River	3	2,3	1
Black Ankle Creek	3			Loosahatchie River Drainage Canal			
Casper Creek	4			Middle Fork Beaver Creek Canal	4		
Clear Creek Canal	4			North Fork Creek River Draianage Canal	4		
Cole Creek	4			Royster Creek	4		
Crooked Creek Drainage Canal	3			Treadville Creek	3		
Davis Jones Creek	3			West Beaver Creek Canal	4		
East Fork Beaver Creek Canal	2						

Table 2-5. Stream Scoring from the Tennessee Rivers Assessment Project.

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 LOOSAHATCHIE 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 2002 305(b) Report):

1. Assess the general water quality conditions of rivers, streams, lakes and wetlands

2. Identify causes of water pollution and the sources of pollutants

3. Specify waters which have been found to pose human health risks due to elevated bacteria levels or contamination of fish

4. Highlight areas of improved water quality

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://www.epa.gov/surf/

The 303(d) list is a compilation of the waters of Tennessee that are water quality limited and fail to support some or all of their classified uses. Water quality limited streams are those that have one or more properties that violate water quality standards. Therefore, the water body is considered to be impacted by pollution and is not fully meeting its designated uses. The 303(d) list does not include streams determined to be fully supporting designated uses as well as 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://www.state.tn.us/environment/wpc/publications/2002303dpropfinal.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 Loosahatchie River Watershed, summarizes data collection and assessment results, and describes impaired waters.

3.2. DATA COLLECTION. Comprehensive water quality monitoring in the Loosahatchie River Watershed was conducted in 1997 and 1998. Data were collected from 93 sites and are from one of four types of sites: 1)Ambient sites, 2)Ecoregion sites, 3)Watershed sites or 4)Aquatic Resources Alteration Permit (ARAP) inspection sites.

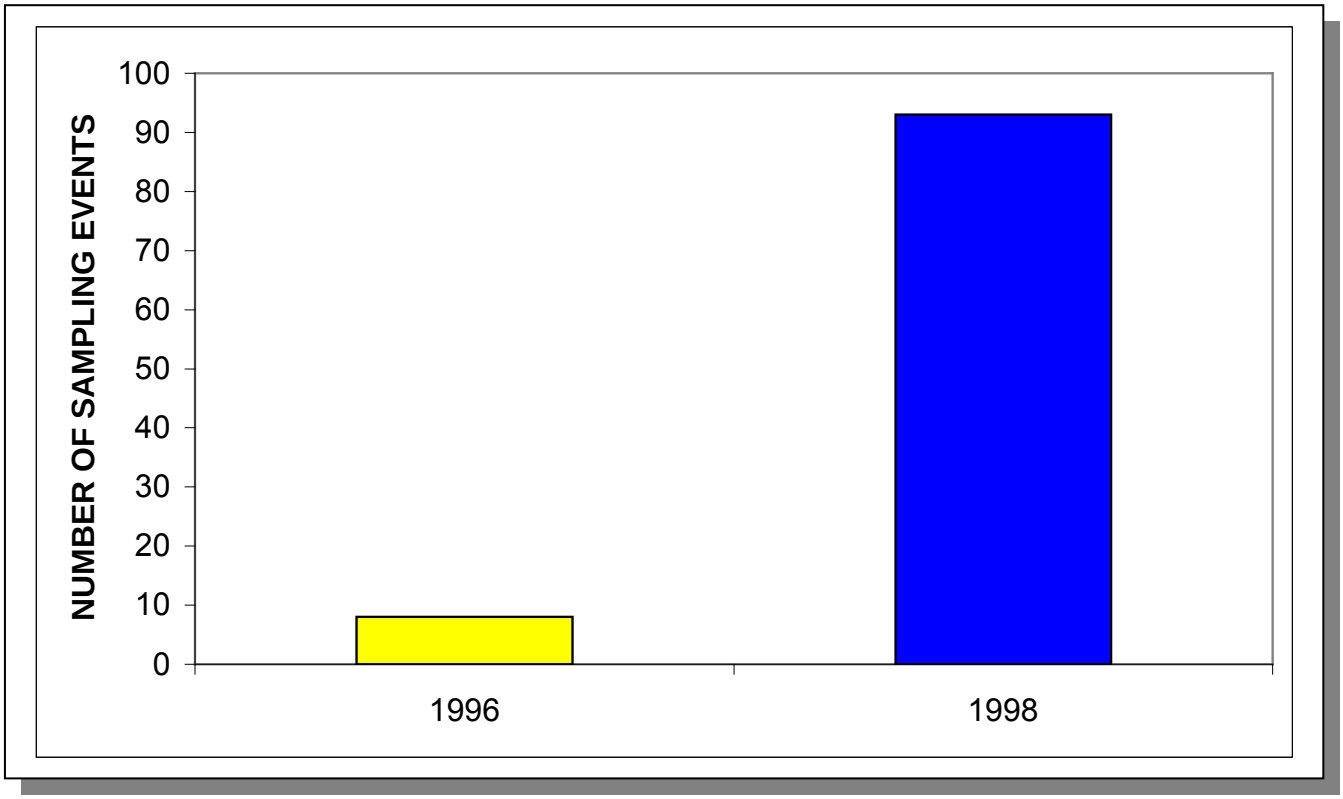


Figure 3-1. Number of Sampling Events Using the Traditional Approach (1996) and Watershed Approach (1998) in the Loosahatchie River Watershed.

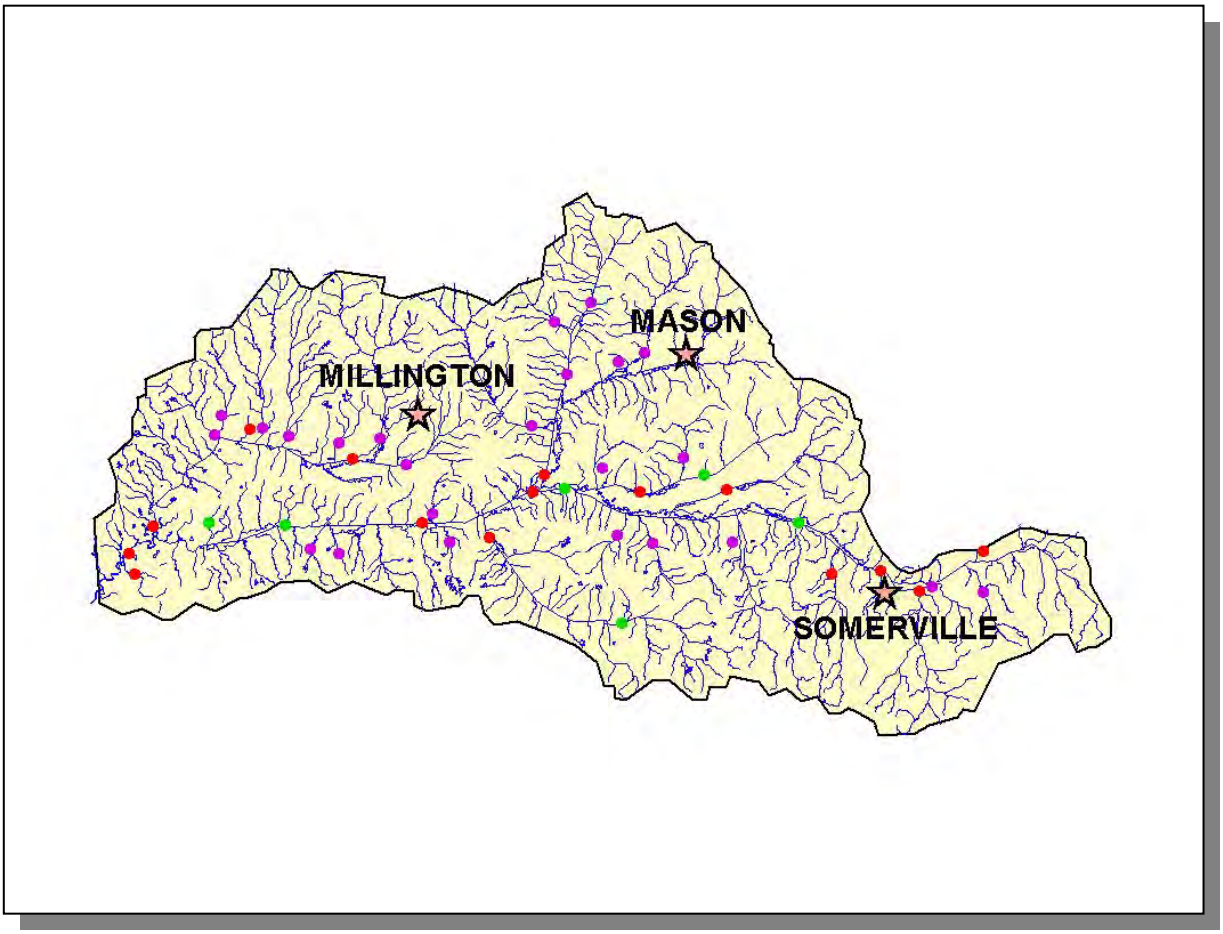


Figure 3-2. Location of Monitoring Sites in the Loosahatchie River Watershed. *Red, Watershed Monitoring Sites; Black, Observational Data Sites; Orange, Rapid Bioassessment Sites; Green, Ambient Monitoring Sites. Locations of Mason, Millington, and Somerville are shown for reference.*

TYPE	NUMBER	TOTAL NUMBER OF SAMPLING EVENTS		
		CHEMICAL ONLY	BIOLOGICAL ONLY	BIOLOGICAL PLUS CHEMICAL (FIELD PARAMETERS)
Ambient	3	4		
Watershed	13	147		
Totals	**16**	**151**		

Table 3-1. Monitoring Sites in the Loosahatchie River Watershed During the Data Collection Phase of the Watershed Approach.

In addition to the 151 sampling events, 58 citizen complaints were investigated from 11/30/2000 through 12/01/2002.

3.2.A. Ambient Monitoring Sites. These fixed-station chemical monitoring sites are sampled quarterly or monthly by the Environmental Assistance Center-Memphis 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 Loosahatchie River Watershed are provided in Loosahatchie-Appendix IV.

Data from ambient monitoring stations are entered into the STORET (Storage and Retrieval) system administered by EPA. Some ambient monitoring stations are scheduled to be monitored as watershed sampling sites.

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 Loosahatchie River Watershed lies within 3 Level III ecoregions (Southeastern Plains, Mississippi Alluvial Plain, Mississippi Valley Loess Plains) and contains 4 subecoregions (Level IV):

- Southeastern Plains and Hills (65e)
- Northern Mississippi Alluvial Plain (73a)
- Bluff Hills (74a)
- Loess Plains (74b)

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 as Watershed sampling sites.

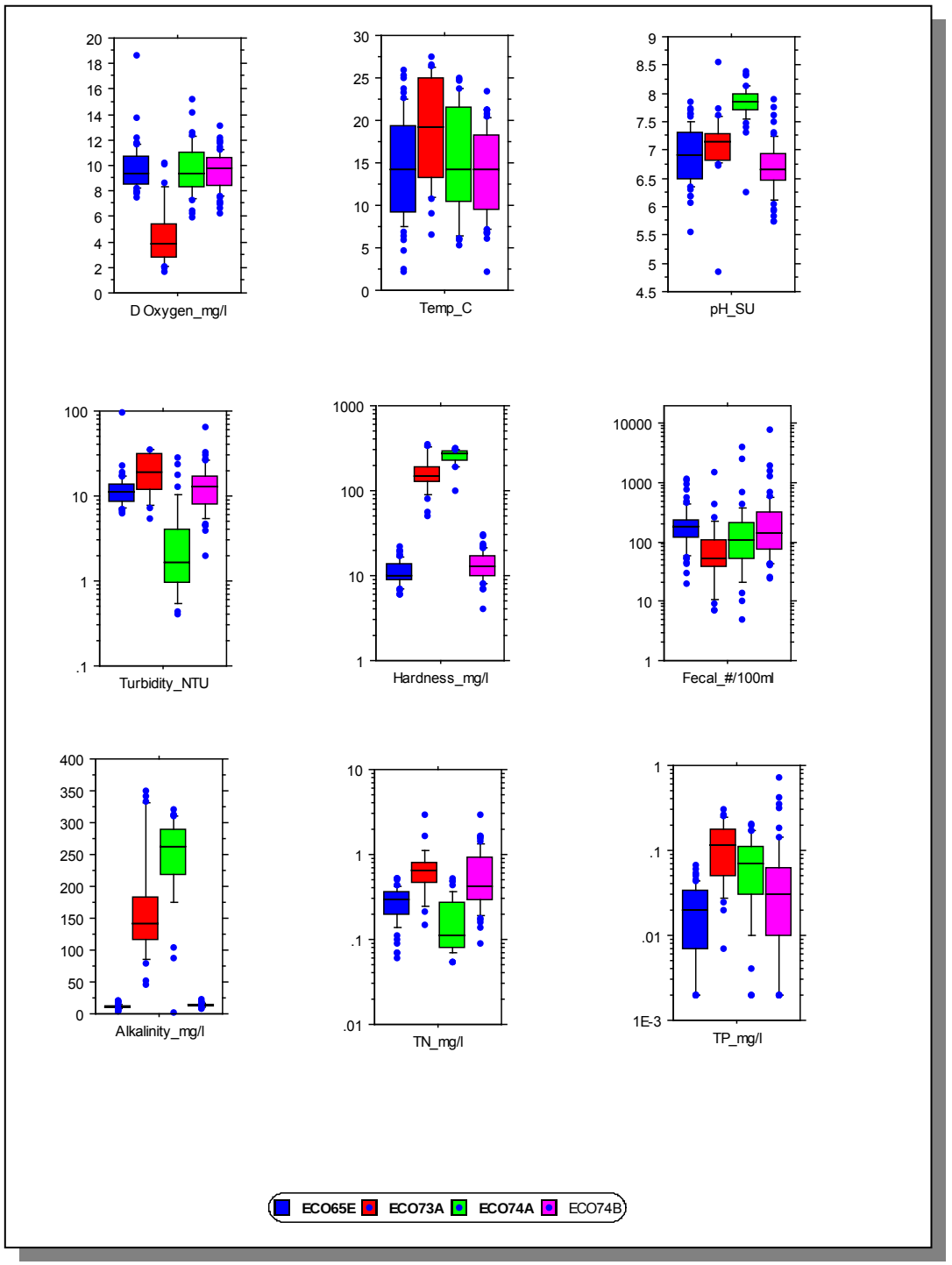


Figure 3-3. Select Chemical Data Collected in Loosahatchie River Watershed Ecoregion Sites*. Boxes and bars illustrate 10th, 25th, median, 75th, and 90th percentiles. Extreme values are also shown as dots.* Fecal, fecal coliform bacteria; TN, Total Nitrogen; TP, Total Phosphorus.

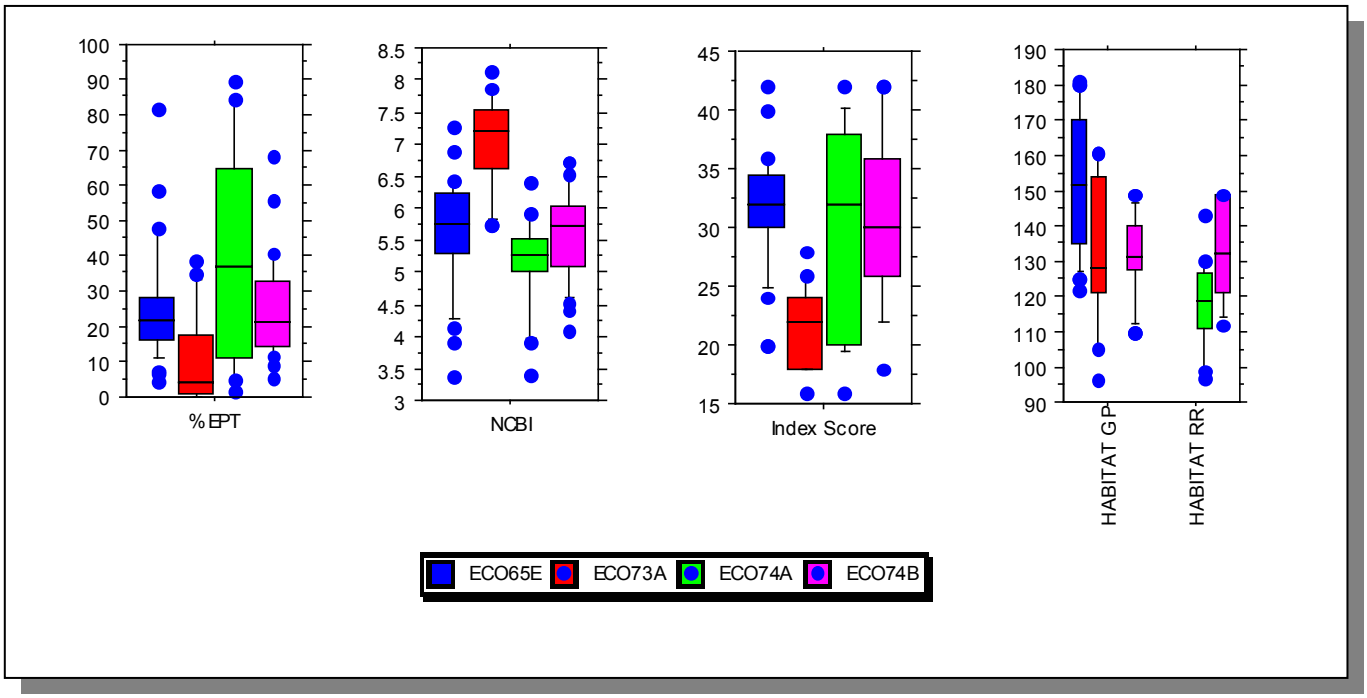


Figure 3-4. Benthic Macroinvertebrate and Habitat Scores for Loosahatchie River Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th, median, 75th, and 90th percentiles. Extreme values are also shown as dots. NCBI, North Carolina Biotic Index. Index Score, Habitat Riffle/Run, and Habitat Glide/Pool scoring system are described in TDEC's Quality System Standard Operating Procedure for Macroinvertebrate Surveys (2002).*

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. Overall use support is a general description of water quality conditions in a water body based on determination of individual use supports. 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 Assistance Centers, 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.

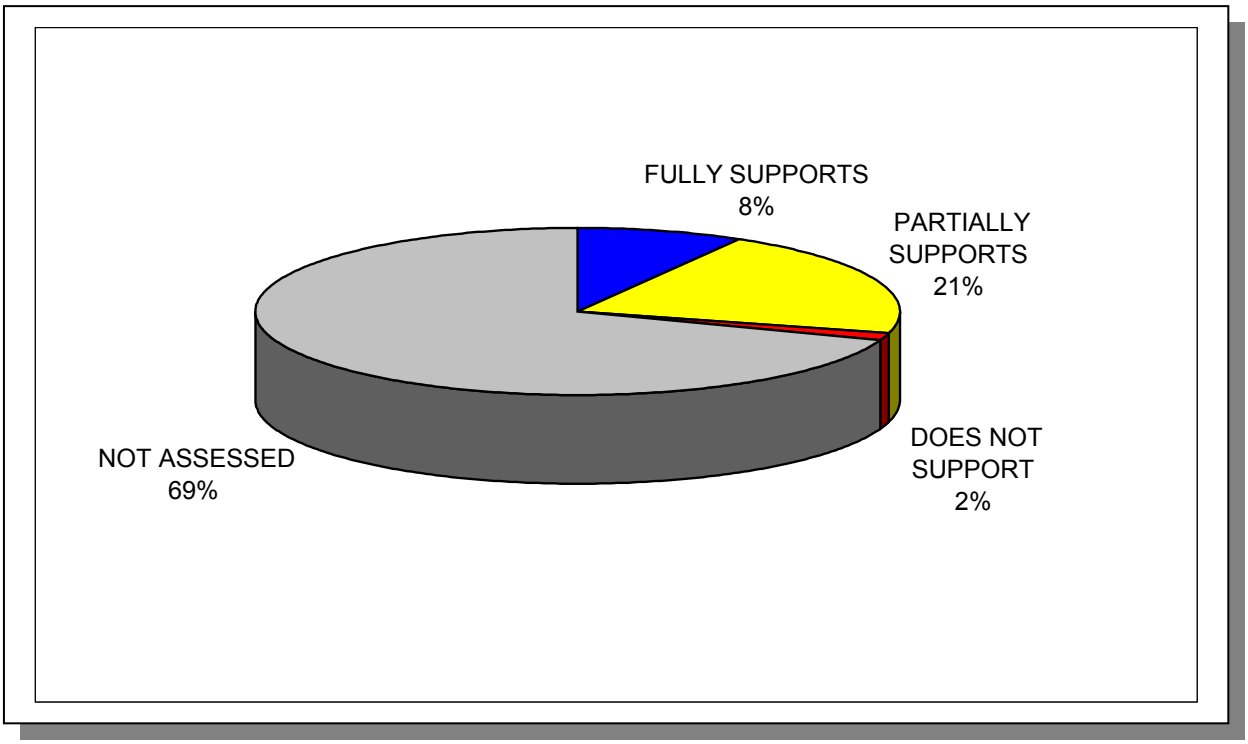


Figure 3-5. Water Quality Assessment for Streams and Rivers in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment.*

3.3.A. Assessment Summary.

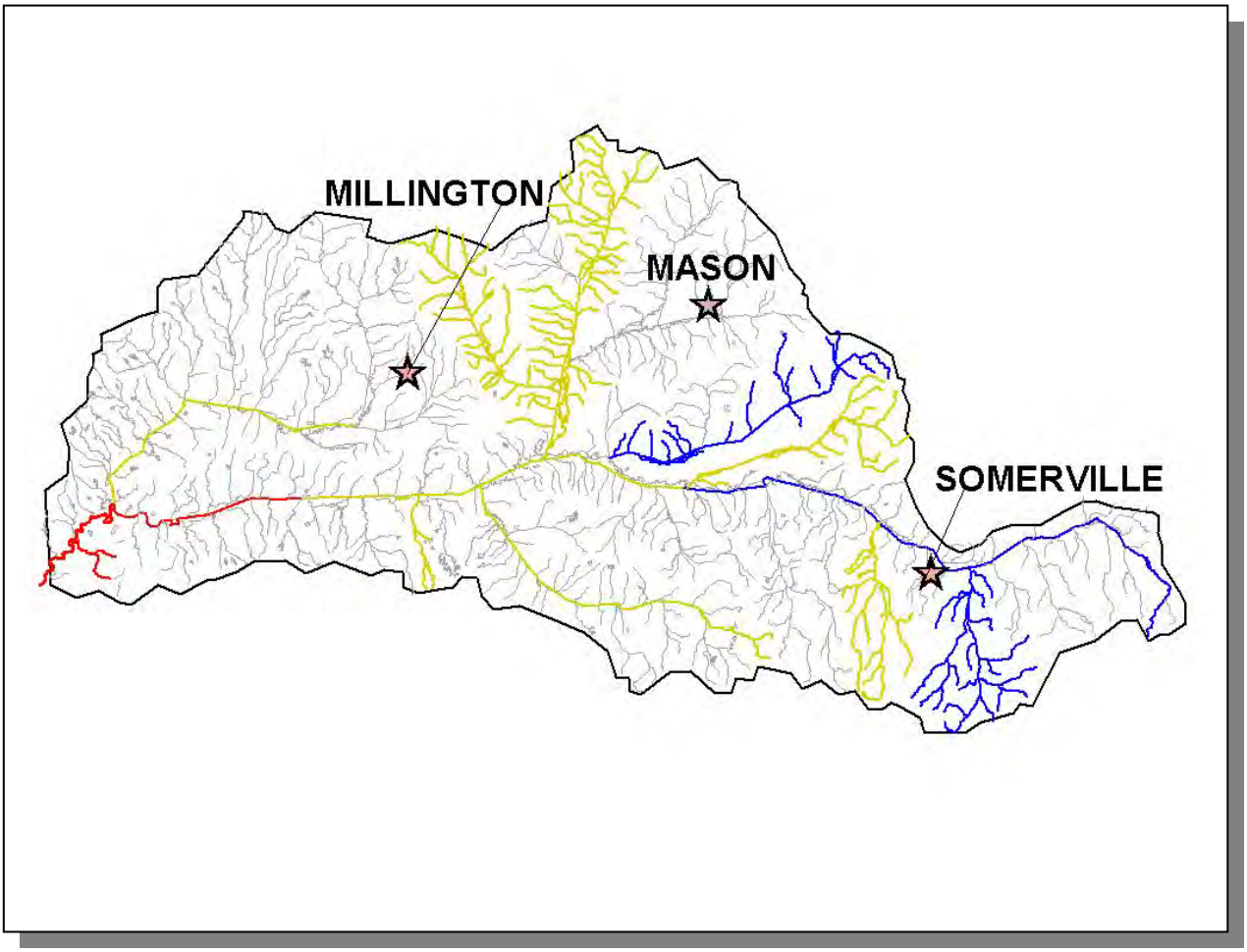


Figure 3-6a. Overall Use Support Attainment in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Gray, Not Assessed. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Mason, Millington, and Somerville are shown for reference. More information is provided in Loosahatchie-Appendix III.*

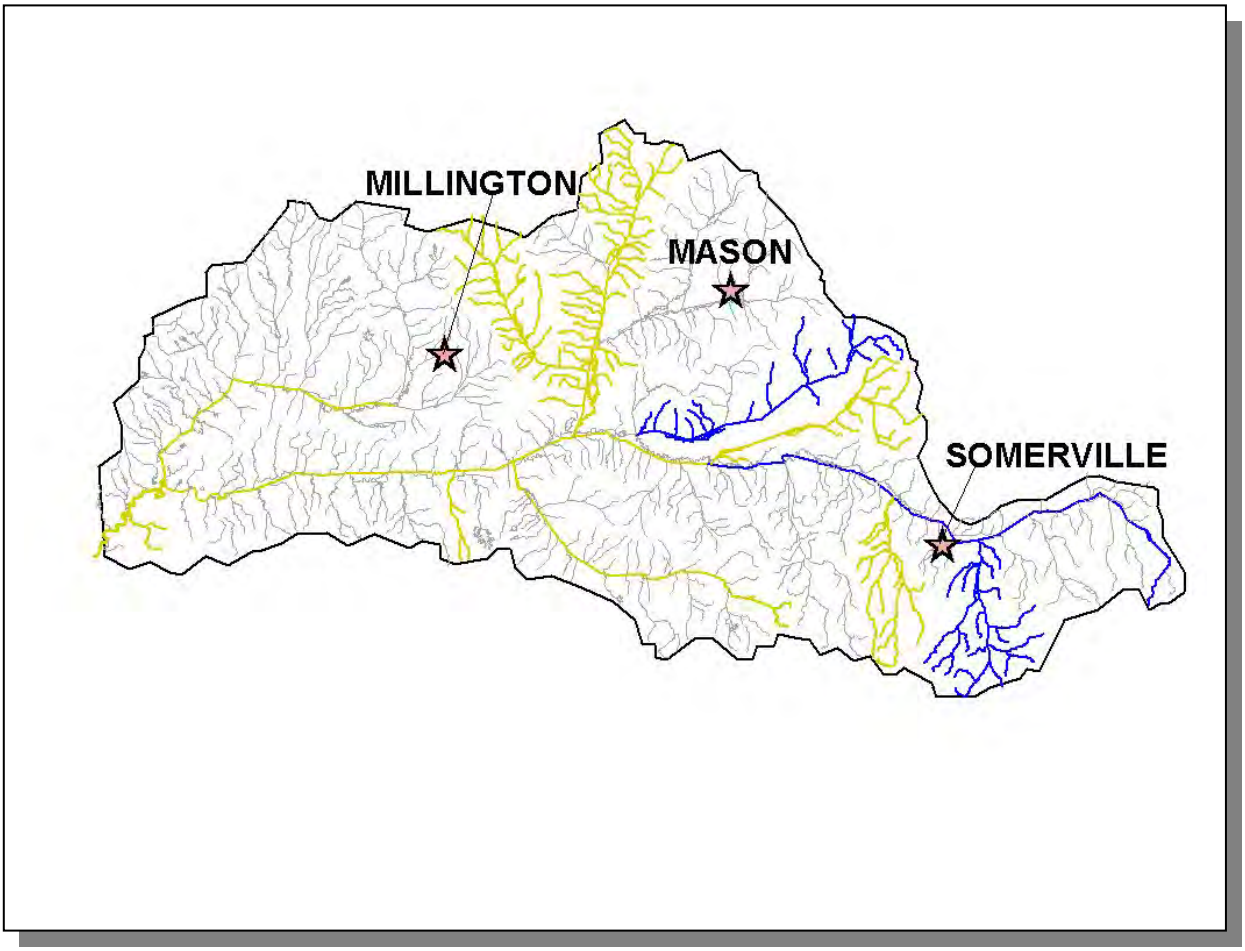


Figure 3-6b. Fish and Aquatic Life Use Support Attainment in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Gray, Not Assessed. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Mason, Millington, and Somerville are shown for reference.*

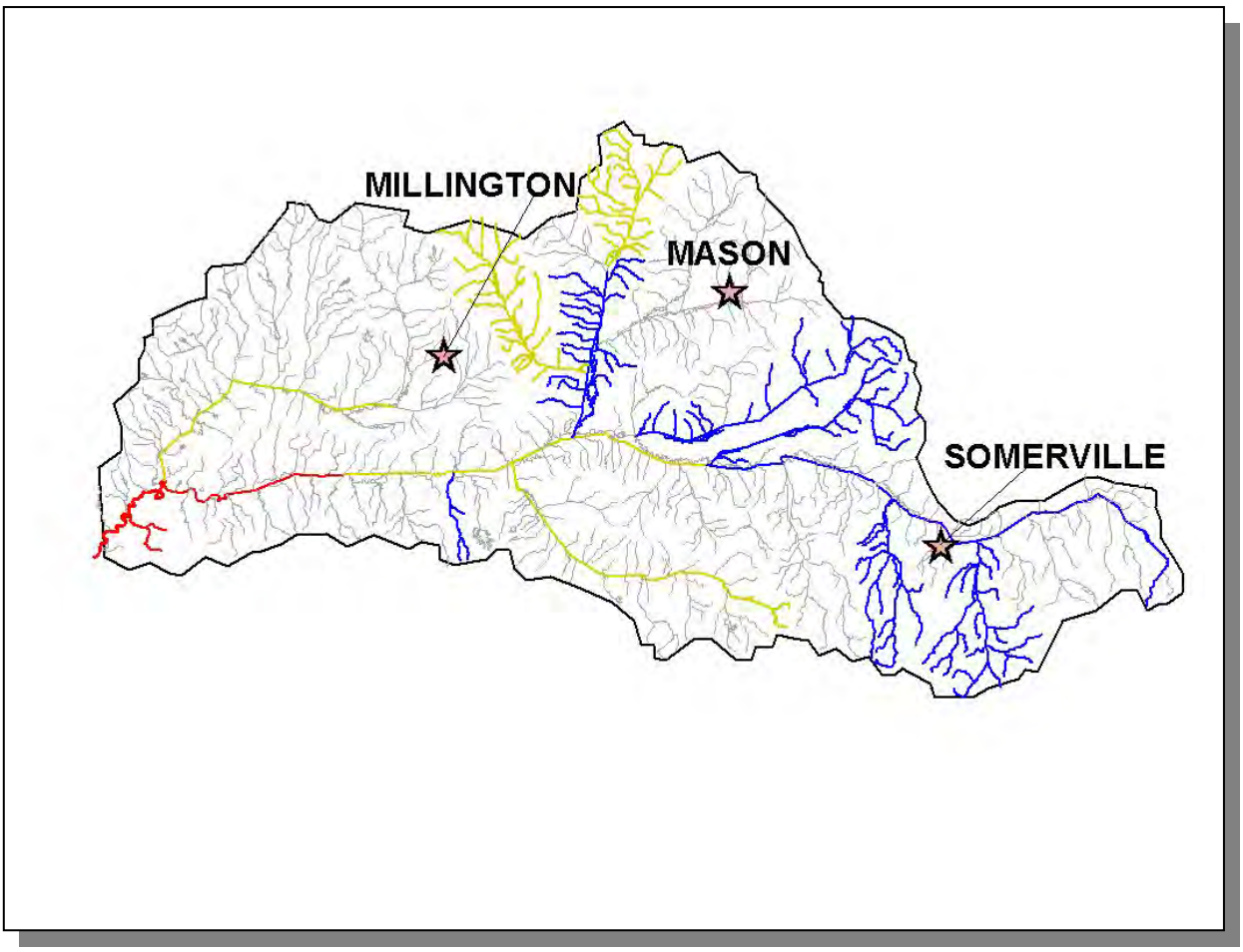


Figure 3-6c. Recreation Use Support Attainment in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Gray, Not Assessed. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Mason, Millington, and Somerville are shown for reference.*

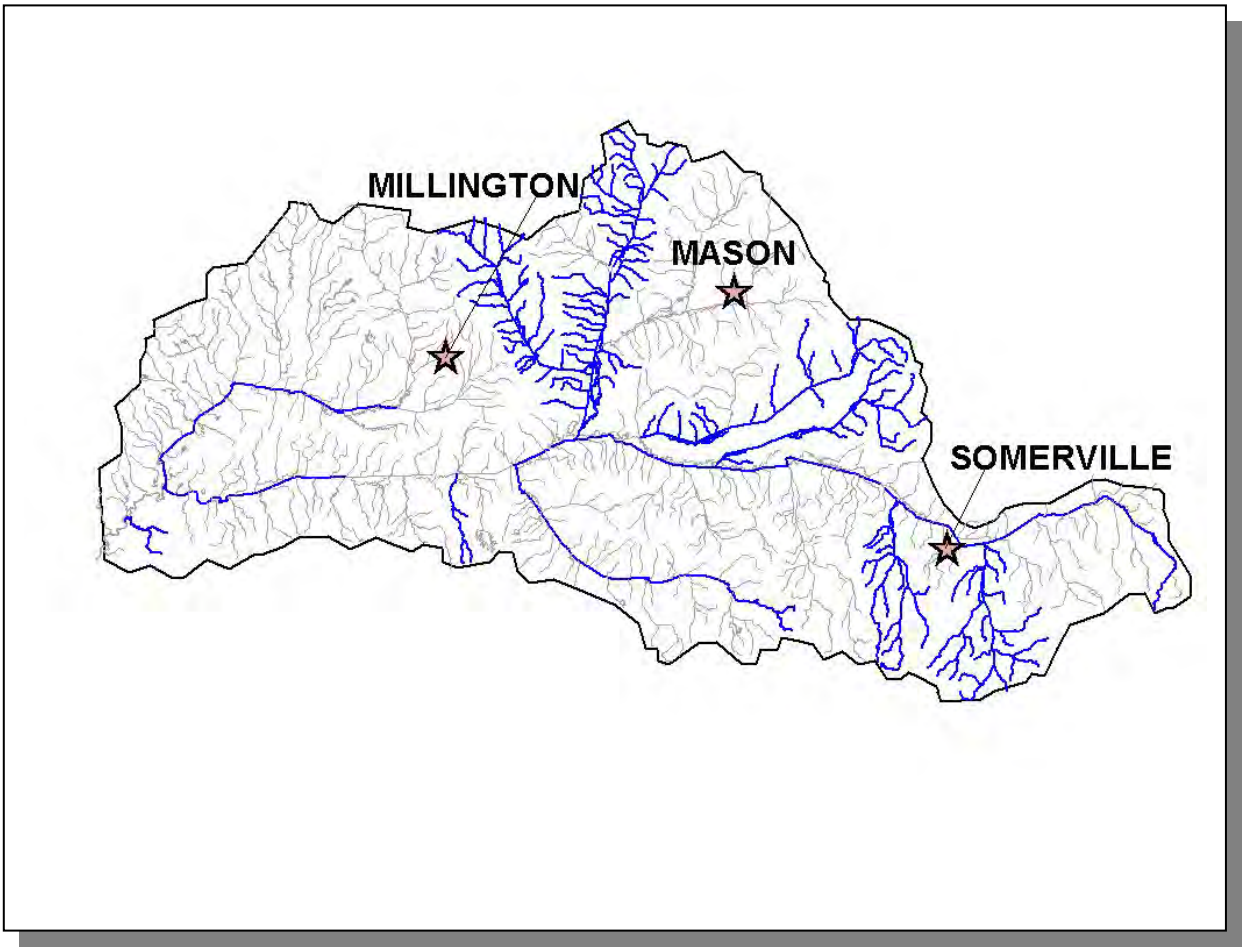


Figure 3-6d. Irrigation Use Support Attainment in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Gray, Not Assessed. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Mason, Millington, and Somerville are shown for reference.*

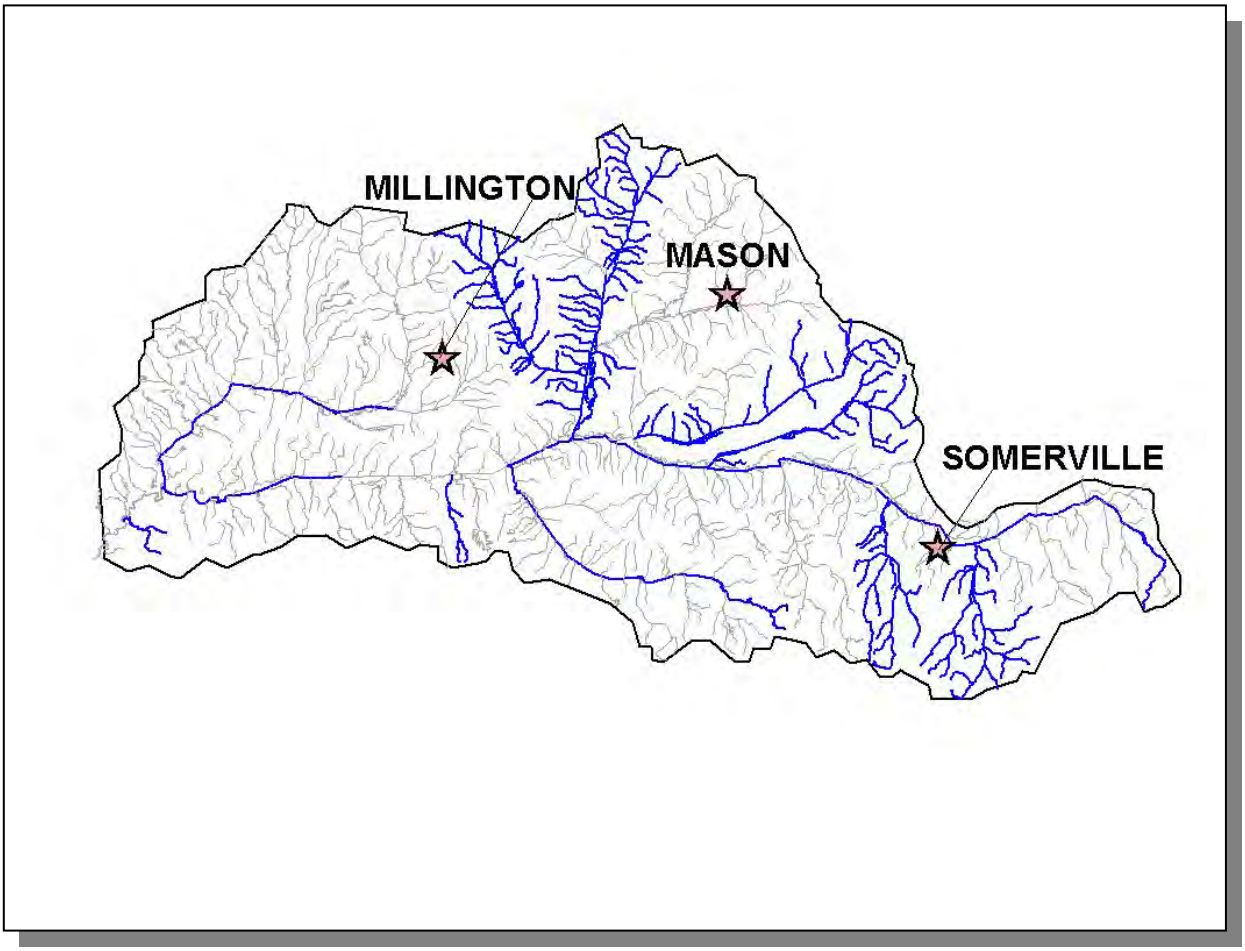


Figure 3-6e. Livestock Watering and Wildlife Use Support Attainment in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Gray, Not Assessed. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Mason, Millington, and Somerville are shown for reference.*

3.3.B. Use Impairment Summary.

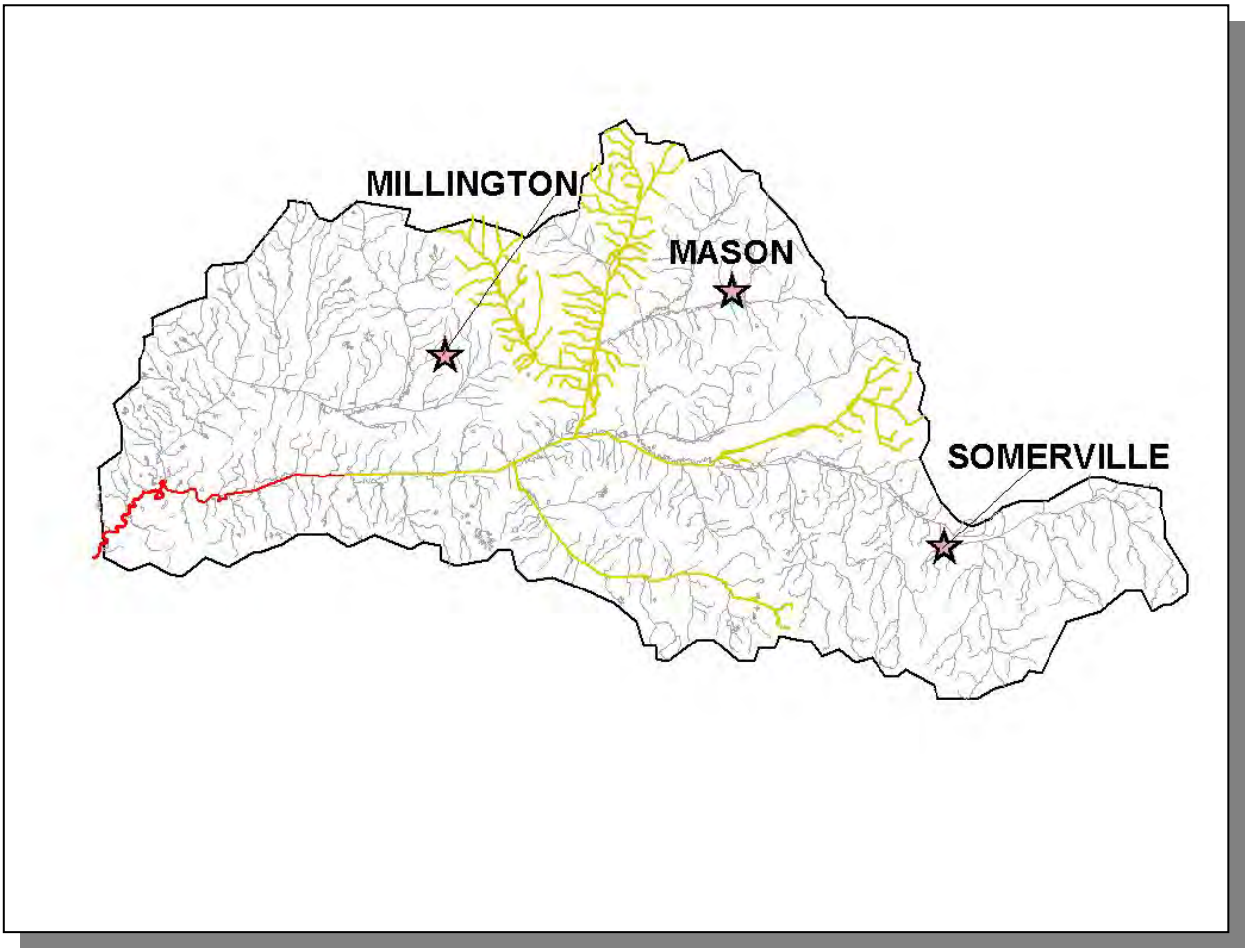


Figure 3-7a. Impaired Streams Due to Habitat Alteration in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Yellow, Partially Supports designated Use; Red, Does Not Support Designated Use; Mason, Millington, and Somerville are shown for reference. More information is provided in Loosahatchie-Appendix III.*

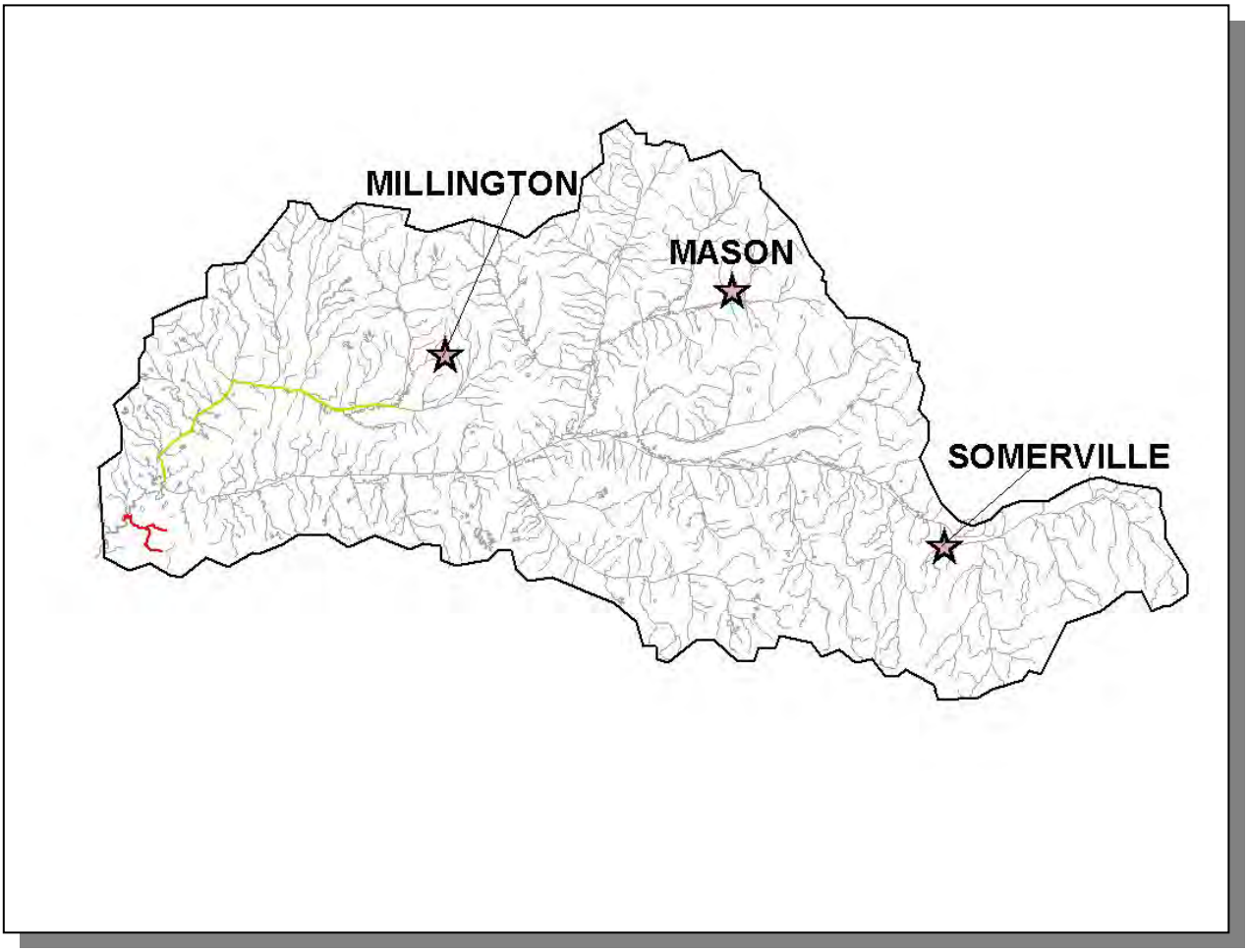


Figure 3-7b. Impaired Streams Due to Organic Enrichment/Low Dissolved Oxygen Levels in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Yellow, Partially Supports designated Use; Red, Does Not Support Designated Use; Mason, Millington, and Somerville are shown for reference. More information is provided in Loosahatchie-Appendix III.*

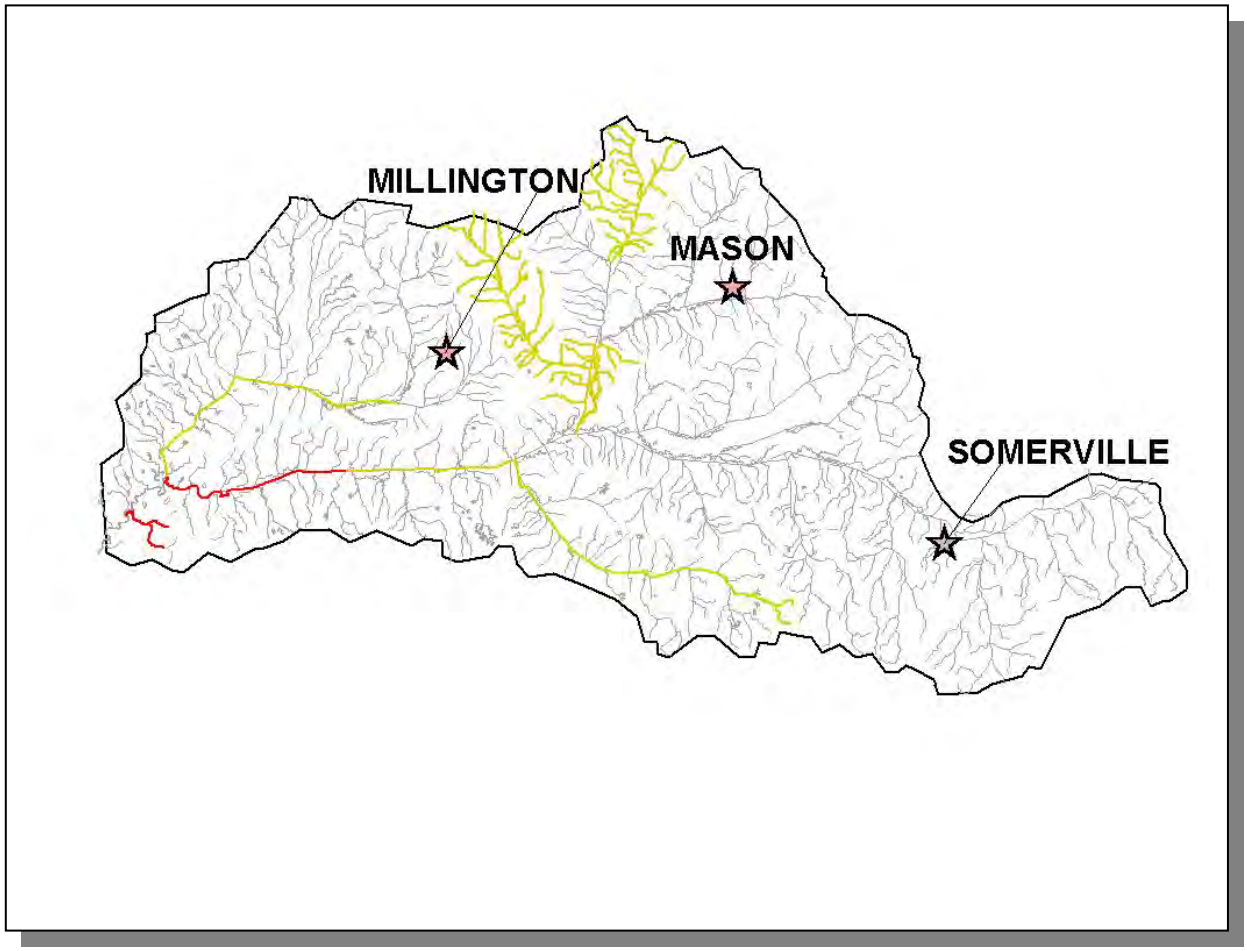


Figure 3-7c. Impaired Streams Due to Pathogens in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Mason, Millington, and Somerville are shown for reference. More information is provided in Loosahatchie-Appendix III.*

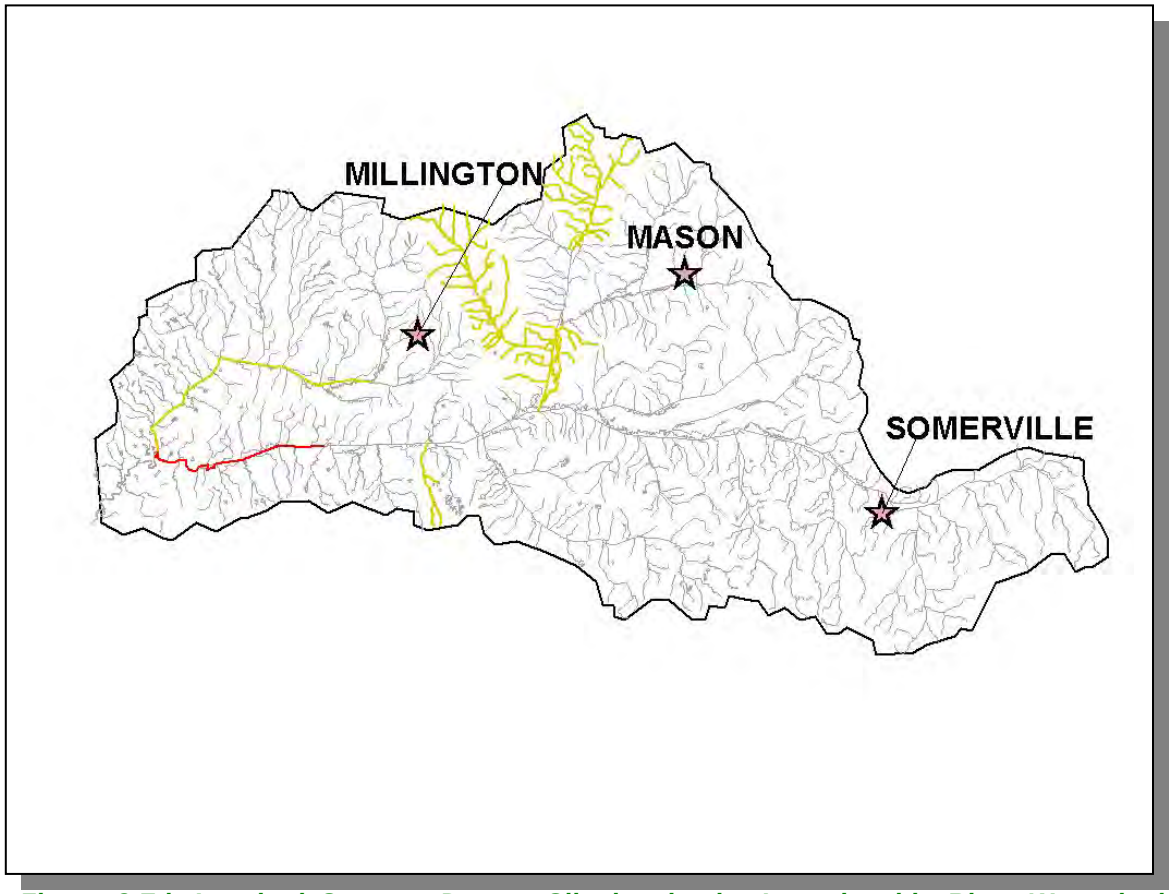


Figure 3-7d. Impaired Streams Due to Siltation in the Loosahatchie River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Mason, Millington, and Somerville are shown for reference. More information is provided in Loosahatchie-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://www.state.tn.us/environment/water.htm

In the year 2002 and beyond, the 303(d) list will be 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 conducted 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://www.state.tn.us/environment/water.htm, Summary maps of each watershed may be viewed at http://www.state.tn.us/environment/wpc/watershed/mapsummary.htm.

3.4. FLUVIAL GEOMORPHOLOGY. Stream width, depth, and cross-sectional dimensions at bankful discharge are key parameters used in characterizing the shape and stability of rivers. Characterization of streams using the fluvial geomorphic stream classification system, which allows prediction of stream stability and physical evolution, is a valuable management tool (Rosgen, 1996).

A fluvial geomorphic curve illustrates relationships between drainage area, bankful dimensions of width, depth and cross-sectional area, and bankful discharge of stream systems that are in dynamic equilibrium. It is a tool to evaluate and predict the physical impacts of channel modifications, flow alterations, and other watershed changes, as well as determining appropriate physical parameters for stream and riparian restoration. Regional curves have been developed and applied in various regions of the country since the mid-1970's (Dunne and Leopold, 1978).

There are several benefits to using regional curves:

- Serving as a valuable regional-specific database for watershed management
- Providing an unbiased, scientific evaluation of the environmental impacts of proposed ARAP and other permitted activities
- Providing a scientific foundation for evaluating and documenting long-term geomorphic and hydrologic changes in the region
- Quantifying environmental impacts
- Suggesting the best approach to restore streams that have been modified

CHAPTER 4

POINT AND NONPOINT SOURCE CHARACTERIZATION OF THE LOOSAHATCHIE RIVER WATERSHED

4.1. BACKGROUND. This chapter is organized by HUC-10 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 1998 303(d) list
iii. Description of nonpoint source contributions

The Loosahatchie River Watershed (HUC 08010209) has been delineated into four HUC 10-digit 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 1.1 beta (developed by Tetra Tech, Inc for EPA Region 4) released in 2000.

WCS integrates with ArcView® v3.2 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.

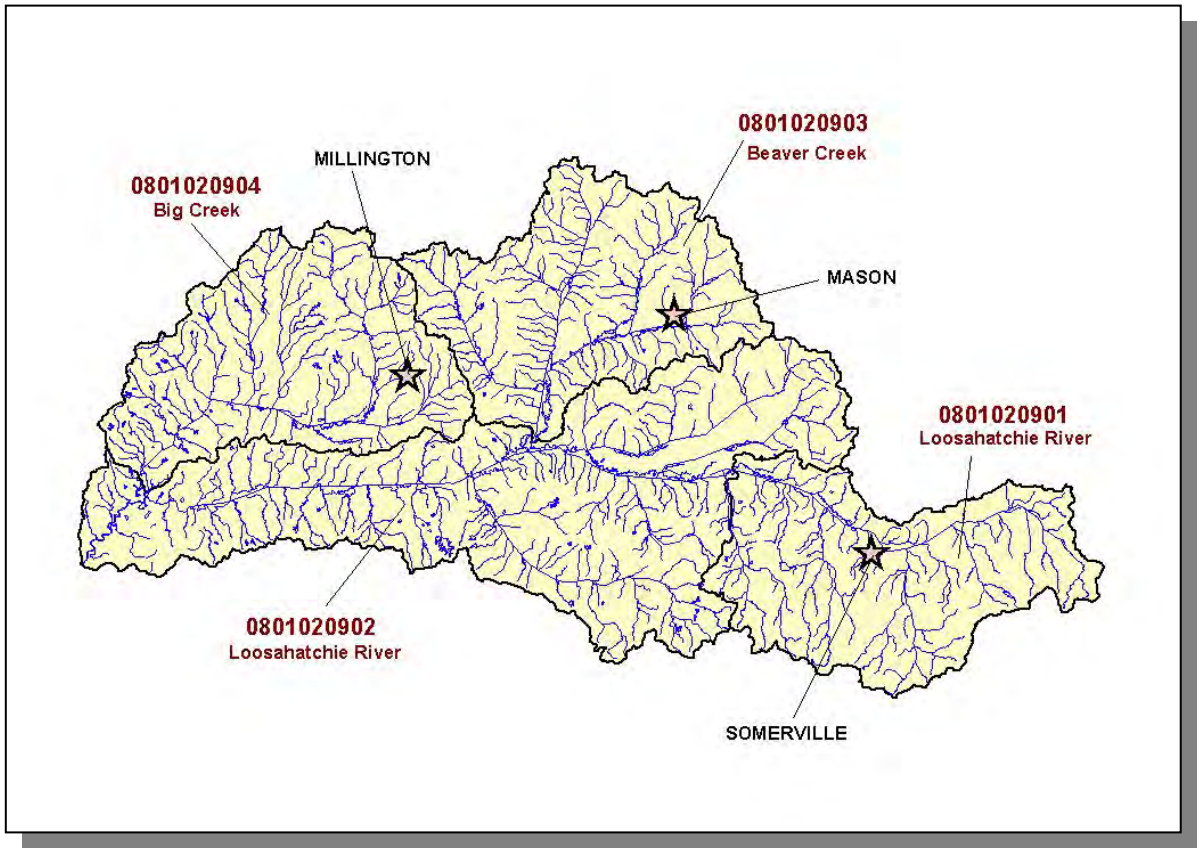


Figure 4-1. The Loosahatchie River Watershed is Composed of four USGS-Delineated Subwatersheds (10-Digit Subwatersheds). *Locations of Mason, Millington, and Somerville are shown for reference.*

4.2. CHARACTERIZATION OF HUC-10 SUBWATERSHEDS. The Watershed Characterization System (WCS) software and data sets provided by EPA Region IV were used to characterize each subwatershed in the Loosahatchie River Watershed.

HUC-10	HUC-12
0801020901	080102090101 (Loosahatchie River)
	080102090102 (Bennetts Creek)
	080102090103 (Loosahatchie River)
	080102090104 (Jones Creek)
	080102090105 (Treadville Creek)
0801020902	080102090201 (Loosahatchie River)
	080102090202 (Little Laurel Canal)
	080102090203 (Little Cypress Canal)
	080102090204 (Loosahatchie River)
	080102090205 (Clear Creek)
	080102090206 (Loosahatchie River)
0801020903	080102090301 (East Beaver Creek)
	080102090302 (Middle Beaver Creek)
	080102090303 (West Beaver Creek)
0801020904	080102090401 (Upper Big Creek)
	080102090402 (Middle Big Creek)
	080102090403 (Lower Big Creek)

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. 0801020901.

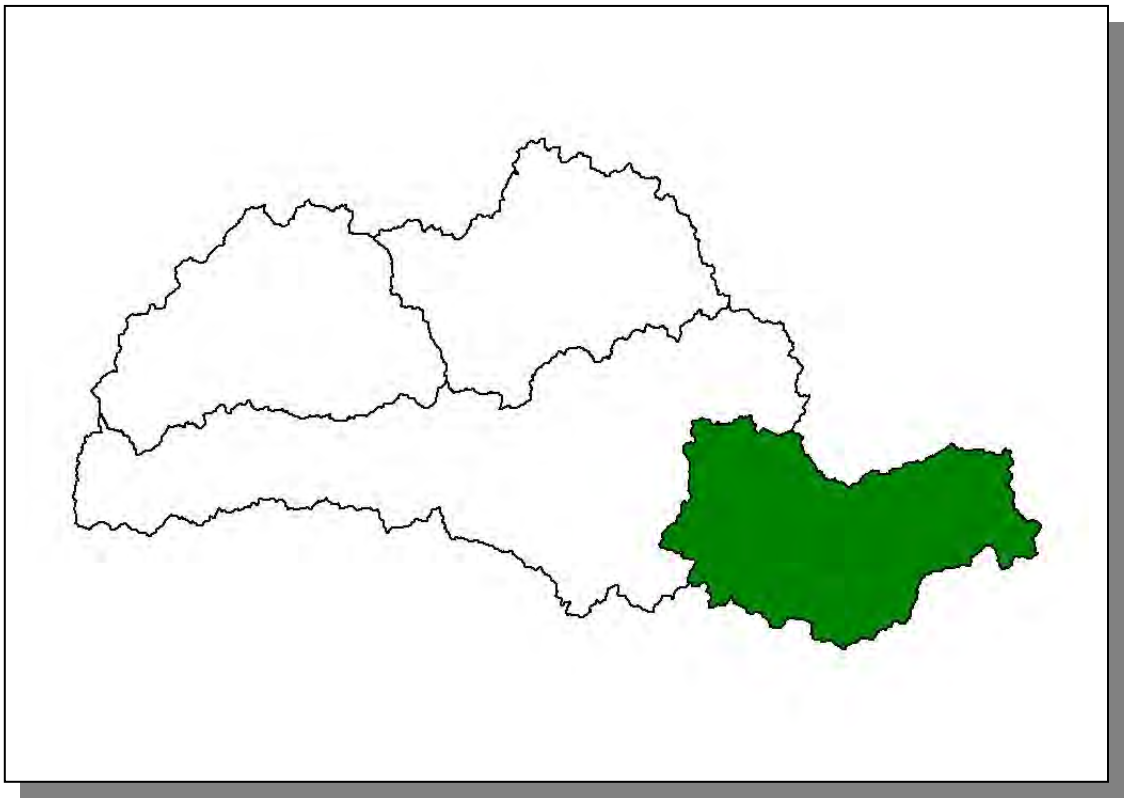


Figure 4-2. Location of Subwatershed 0801020901. *All Loosahatchie HUC-10 subwatershed boundaries are shown for reference.*

4.2.A.i. General Description.

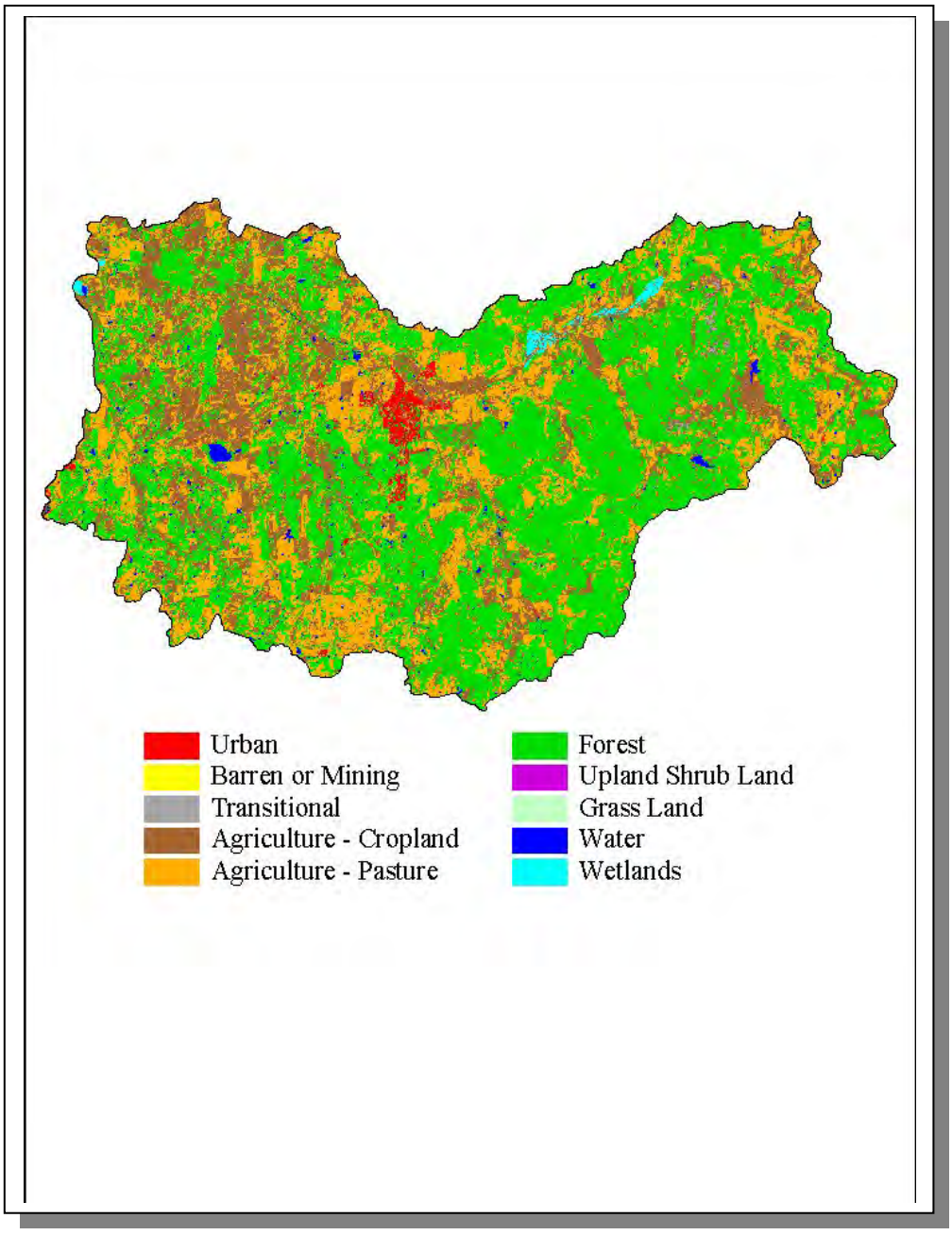


Figure 4-3. Illustration of Land Use Distribution in Subwatershed 0801020901.

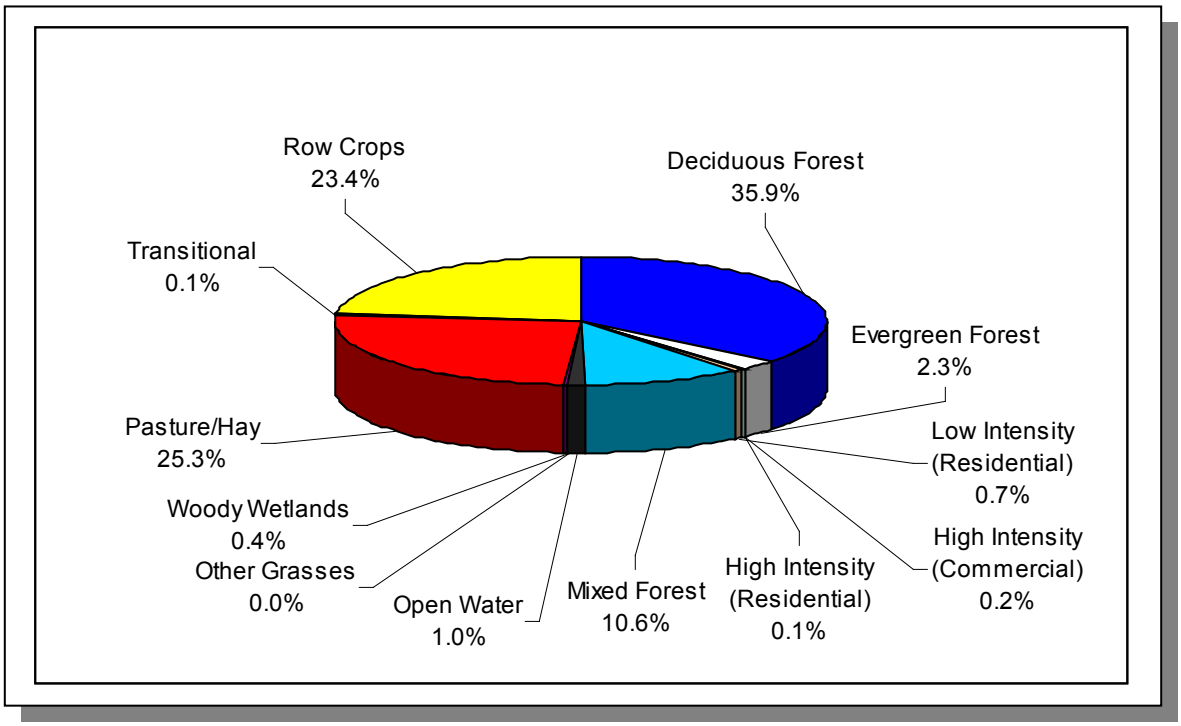


Figure 4-4. Land Use Distribution in Subwatershed 0801020901. *More information is provided in Loosahatchie-Appendix IV.*

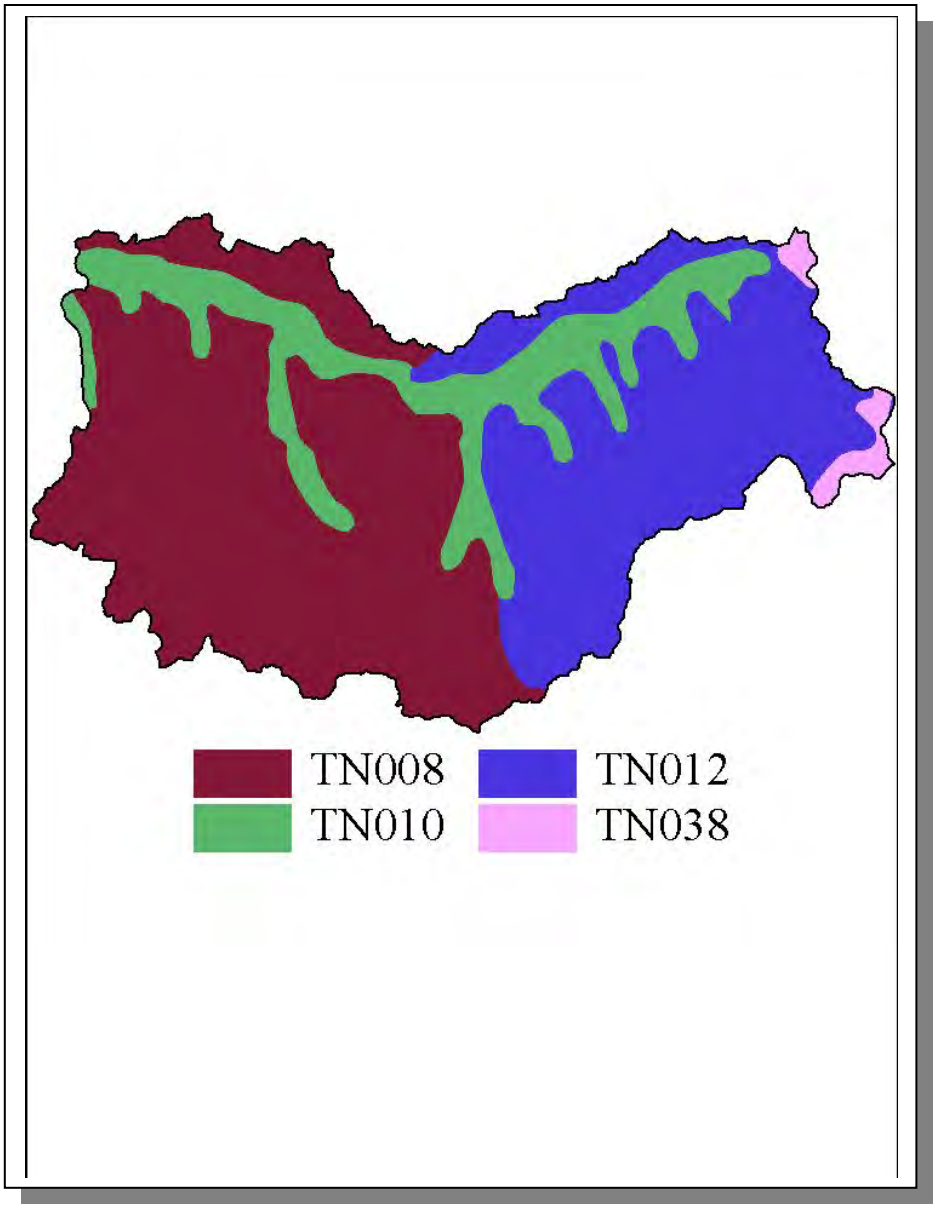


Figure 4-5. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020901.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN008	2.00	C	1.38	5.20	Silty Loam	0.48
TN010	81.00	C	1.33	5.11	Silty Loam	0.44
TN012	1.00	C	2.52	5.13	Silty Loam	0.39
TN038	9.00	C	1.65	5.20	Silty Loam	0.46

Table 4-2. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020901. *More details are provided in Loosahatchie-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		% CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Fayette	25,559	29,412	20.05	5,125	5,898	15.1
Hardeman	23,377	24,702	1.47	344	364	5.8
Totals	**48,936**	**54,114**		**5,469**	**6,262**	**14.5**

Table 4-3. Population Estimates in Subwatershed 0801020901.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Oakland	Fayette	430	145	126	18	1
Somerville	Fayette	2,091	916	881	15	20
Williston	Fayette	383	146	9	133	4
Total		**2,904**	**1,207**	**1,016**	**166**	**25**

Table 4-4. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0801020901.

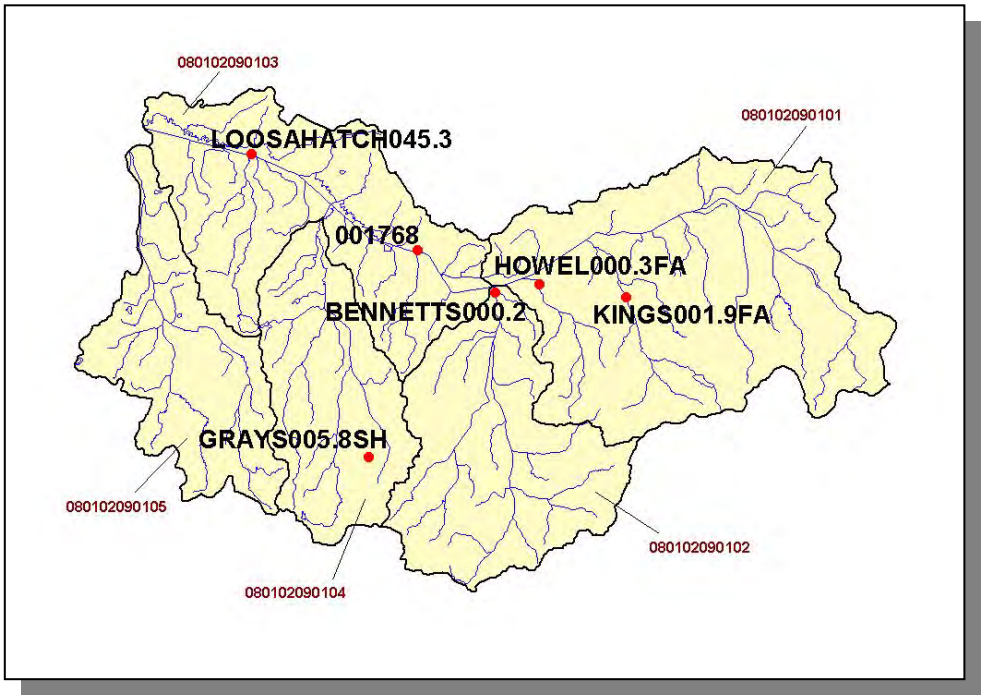


Figure 4-6. Location of Storet Monitoring Sites in Subwatershed 0801020901. *Subwatershed 080102090101, 080102090102, 080102090103, 080102090104, and 080102090105 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

4.2.A.ii. Point Source Contributions.

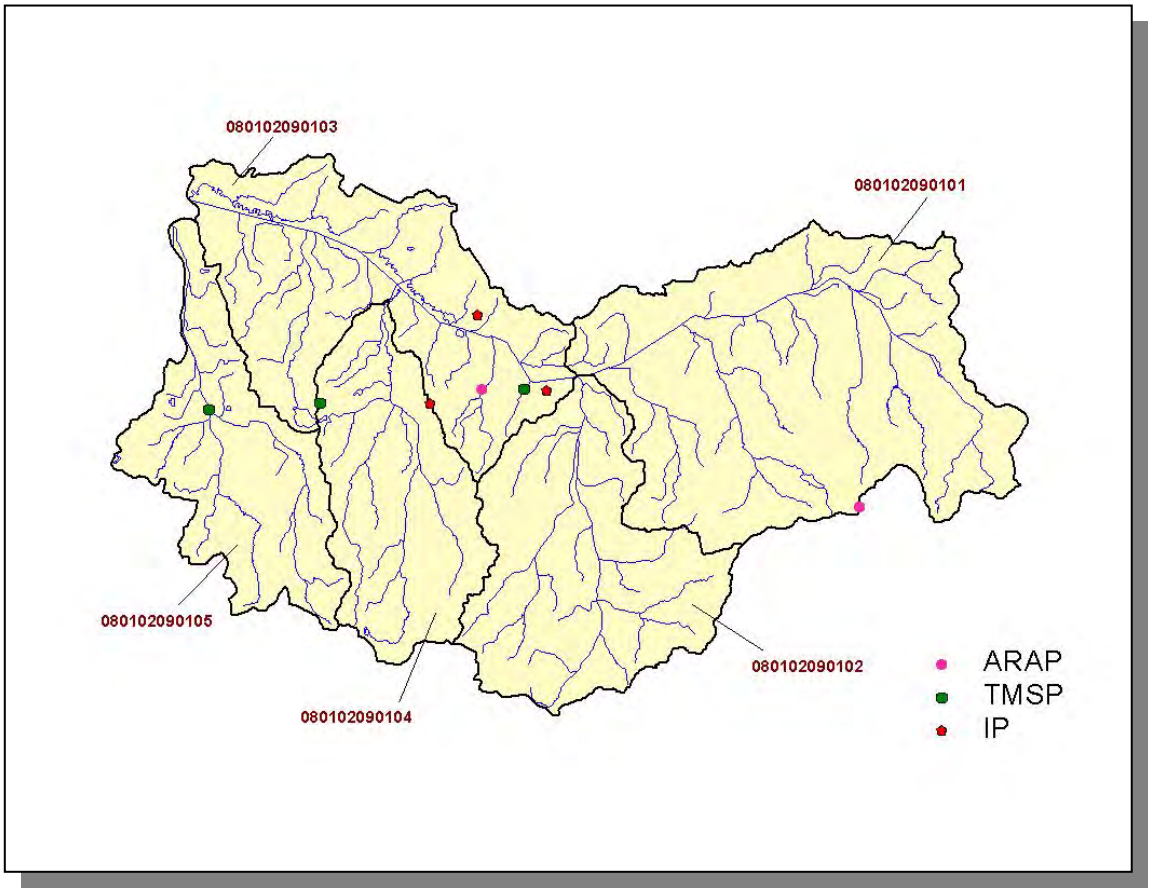


Figure 4-7. Location of Active Point Source Facilities in Subwatershed 0801020901. *Subwatershed 080102090101, 080102090102, 080102090103, 080102090104, and 080102090105 boundaries are shown for reference. More information is provided in the following charts.*

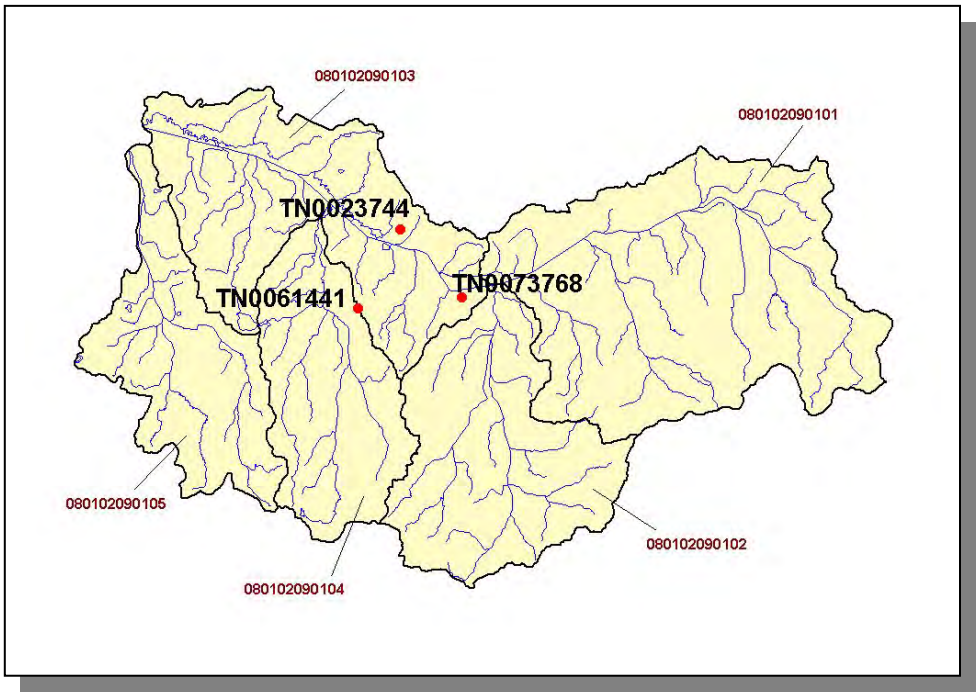


Figure 4-8. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0801020901. *Subwatershed 080102090101, 080102090102, 080102090103, 080102090104, and 080102090105 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

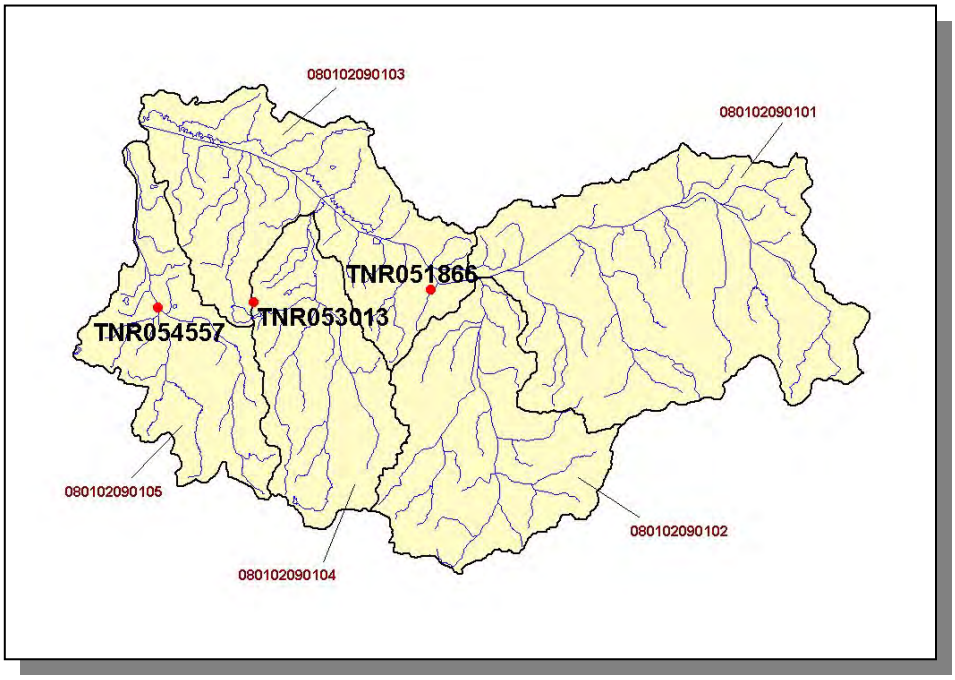


Figure 4-9. Location of TMSP Facilities in Subwatershed 0801020901. *Subwatershed 080102090101, 080102090102, 080102090103, 080102090104, and 080102090105 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

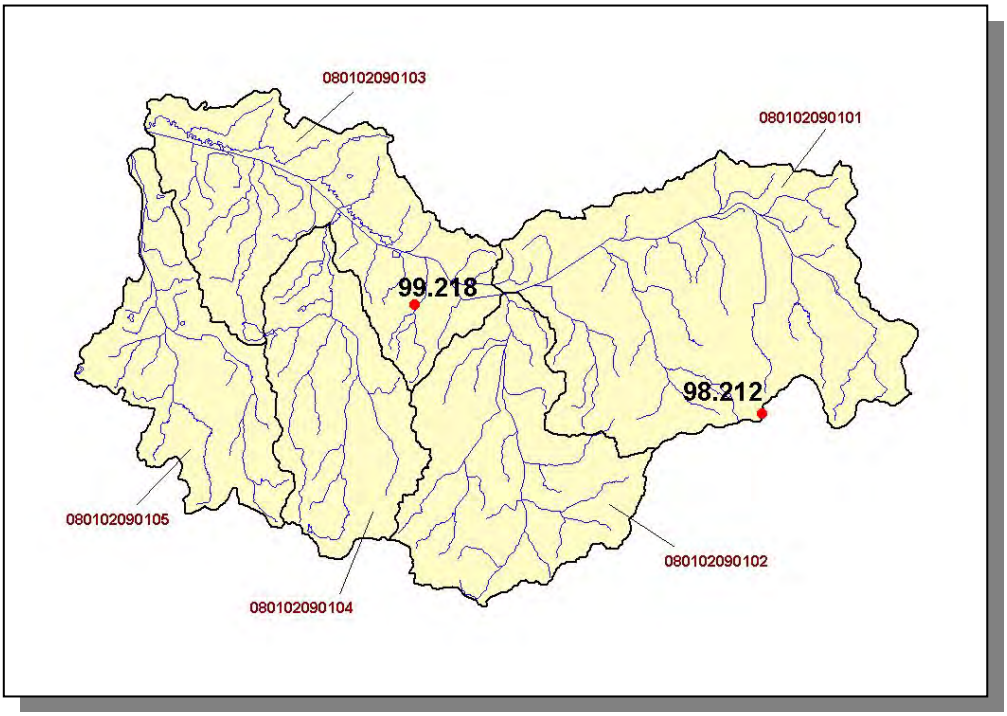


Figure 4-10. Location of ARAP Sites (Individual Permits) in Subwatershed 0801020901. *Subwatershed 080102090101, 080102090102, 080102090103, 080102090104, and 080102090105 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

4.2.A.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
3,663	6,863	233	5	0	6,369	37

Table 4-5. Summary of Livestock Count Estimates in Subwatershed 0801020901. *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)
Fayette	152.0	152.0	1.1	3.3
Hardeman	247.1	247.1	5.0	18.6
Totals	**399.1**	**399.1**	**6.1**	**21.9**

Table 4-6. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 0801020901.

CROPS	TONS/ACRE/YEAR
Corn (Row Crops)	19.12
Soybeans (Row Crops)	10.06
Cotton (Row Crops)	10.15
Sorghum (Row Crops)	3.04
Grass (Hayland)	0.34
Legume (Hayland)	0.16
Legume/Grass (Hayland)	0.22
Grass (Pastureland)	0.48
Grass,Forbs, Legumes (Mixed Pasture)	0.78
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Conservation Reserve Program Land	0.44
Wheat (Close Grown Cropland)	3.55
Fruit (Horticultural)	0.39
Summer Fallow (Other Cropland)	6.11
Other Cropland (Not Planted)	1.68
Farmsteads and Ranch Headquarters	0.18

Table 4-7. Annual Estimated Total Soil Loss in Subwatershed 0801020901.

4.2.B. 0801020902.

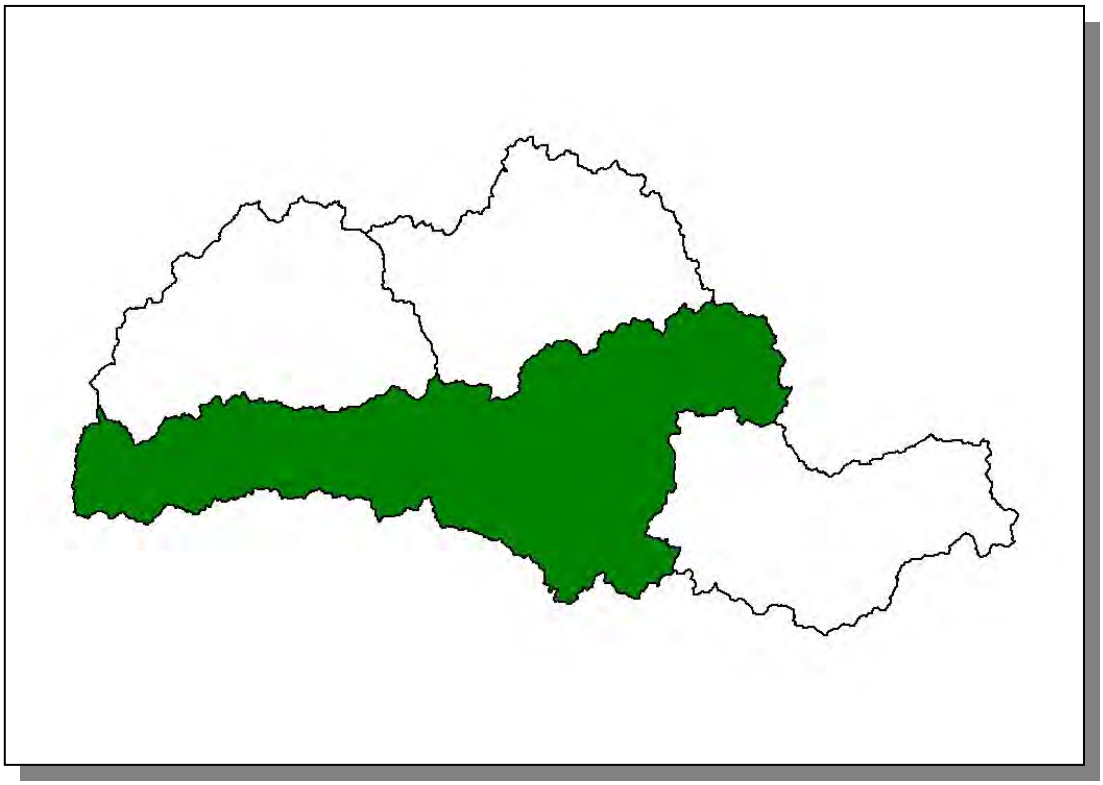


Figure 4-11. Location of Subwatershed 0801020902. *All Loosahatchie HUC-10 subwatershed boundaries are shown for reference.*

4.2.B.i. General Description.

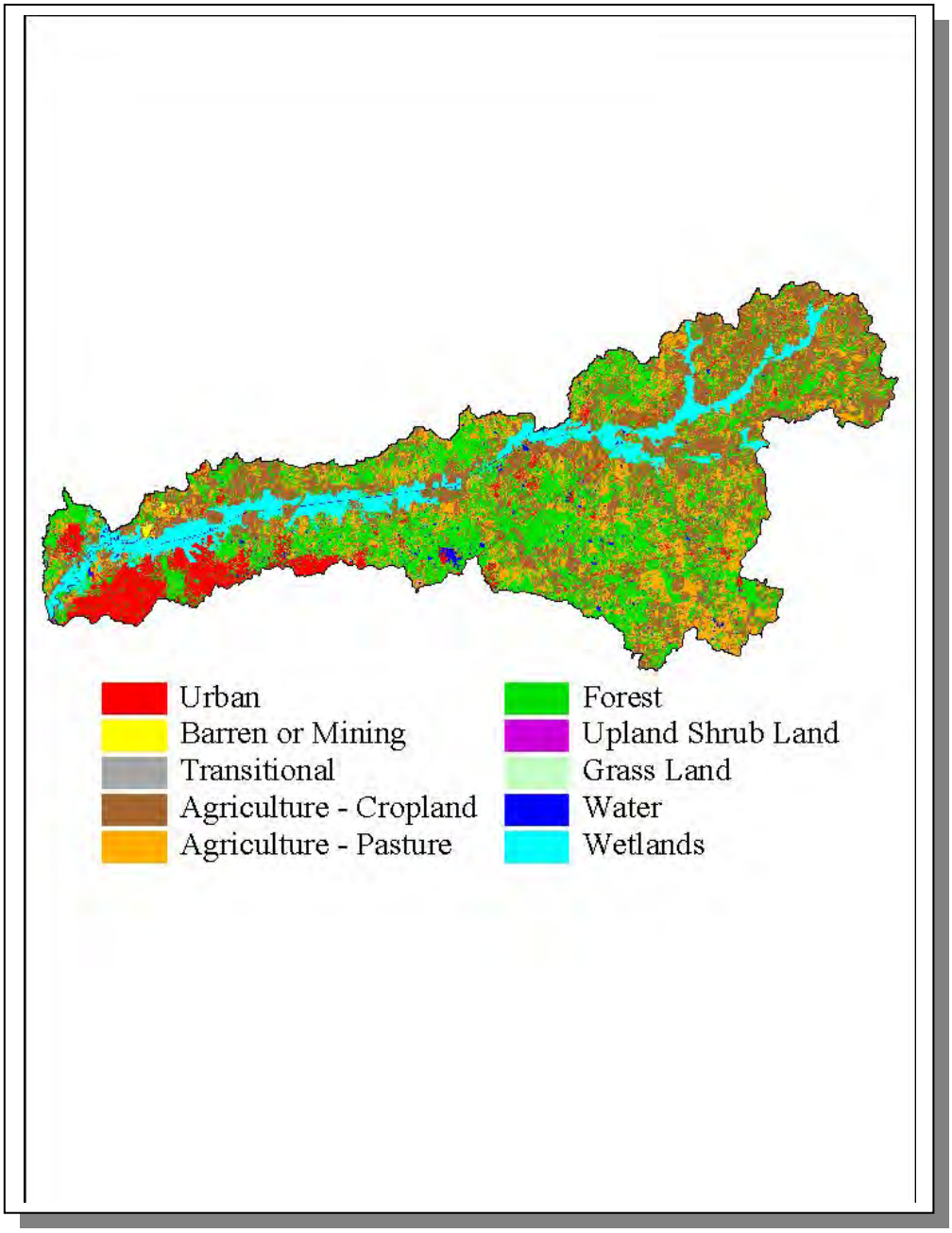


Figure 4-12. Illustration of Land Use Distribution in Subwatershed 0801020902.

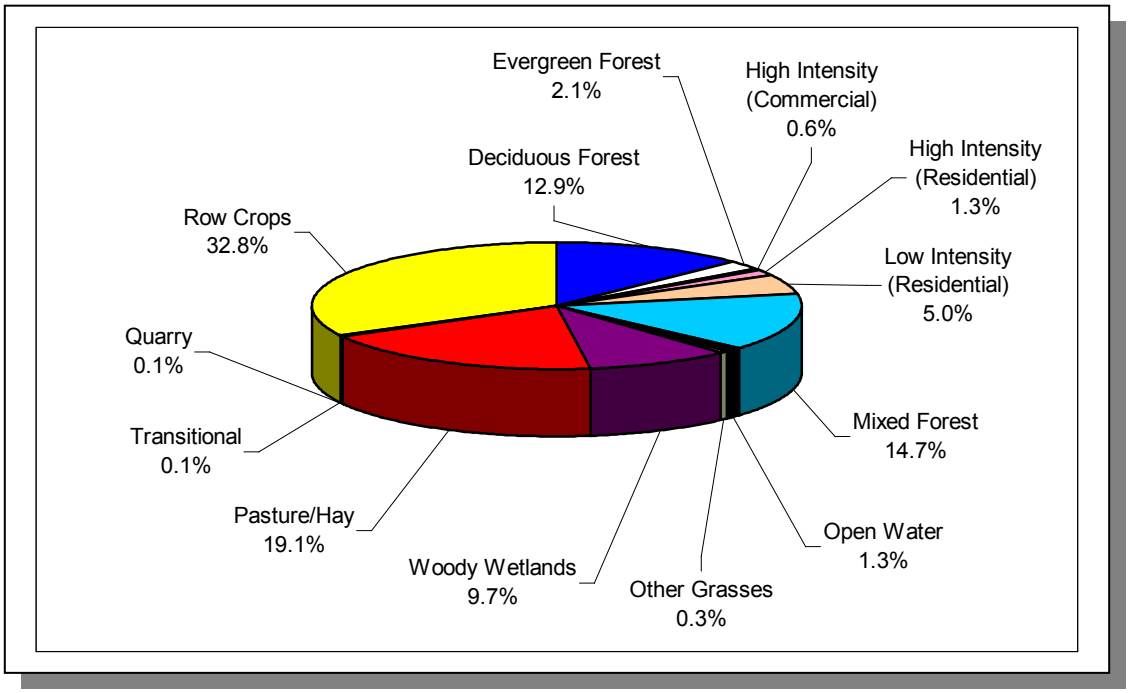


Figure 4-13. Land Use Distribution in Subwatershed 0801020902. *More information is provided in Loosahatchie-Appendix IV.*

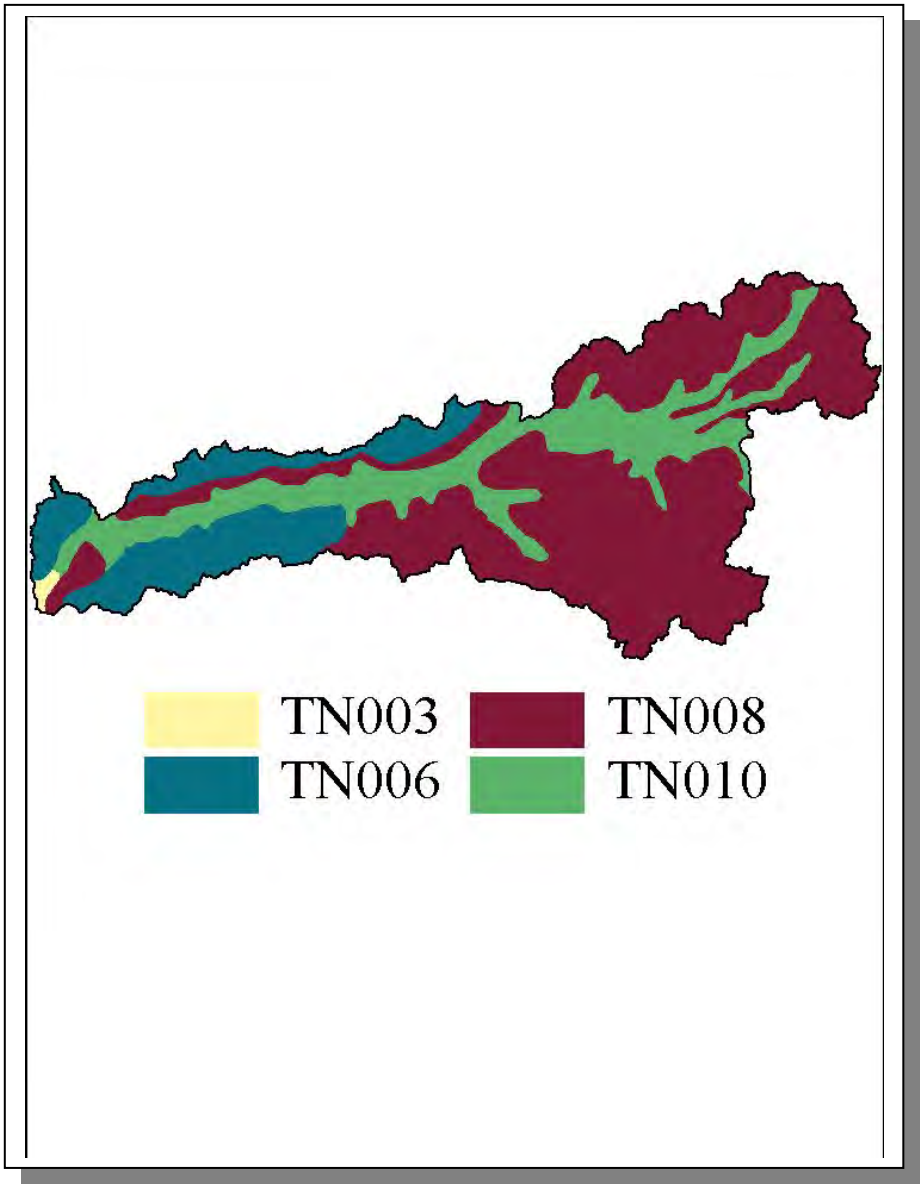


Figure 4-14. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020902.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN001	14.00	C	2.31	7.00	Silty Loam	0.33
TN003	62.00	C	0.50	6.65	Silty Clay	0.33
TN006	0.00	C	1.30	5.42	Silty Loam	0.48
TN008	2.00	C	1.38	5.20	Silty Loam	0.48
TN010	81.00	C	1.33	5.11	Silty Loam	0.44

Table 4-8. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020902. *More information is provided in Loosahatchie-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Fayette	25,559	29,412	21.63	5,528	6,321	15.1
Shelby	826,330	865,318	17.51	144,689	151,515	4.7
Total	**851,889**	**894,730**		**150,217**	**157,876**	**5.1**

Table 4-9. Population Estimates in Subwatershed 0801020902.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Arlington	Shelby	1,541	372	338	32	2
Bartlett	Shelby	26,989	8,807	8,545	217	45
Lakeland	Shelby	7,484	3,900	3,744	154	2
Memphis	Shelby	610,337	248,573	247,138	793	642
Millington	Shelby	17,866	4,440	4,269	37	134
Braden	Fayette	373	141	6	129	6
Gallaway	Fayette	743	220	165	47	8
Oakland	Fayette	430	145	126	18	1
Total		**659,483**	**263,173**	**260,906**	**1,427**	**840**

Table 4-10. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0801020902.

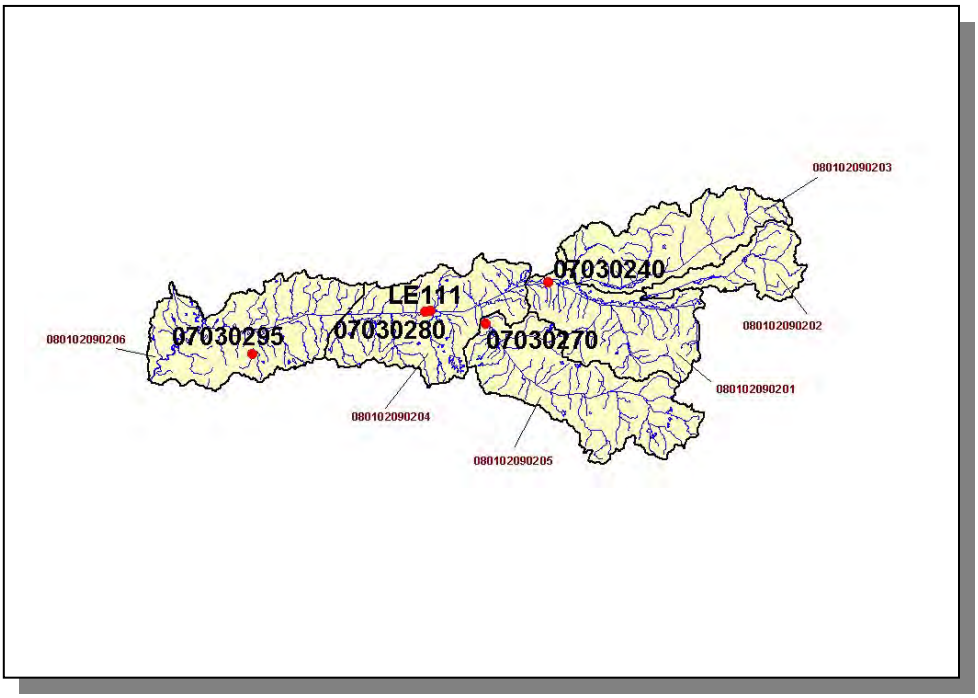


Figure 4-15. Location of Historical Streamflow Data Collection Sites in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

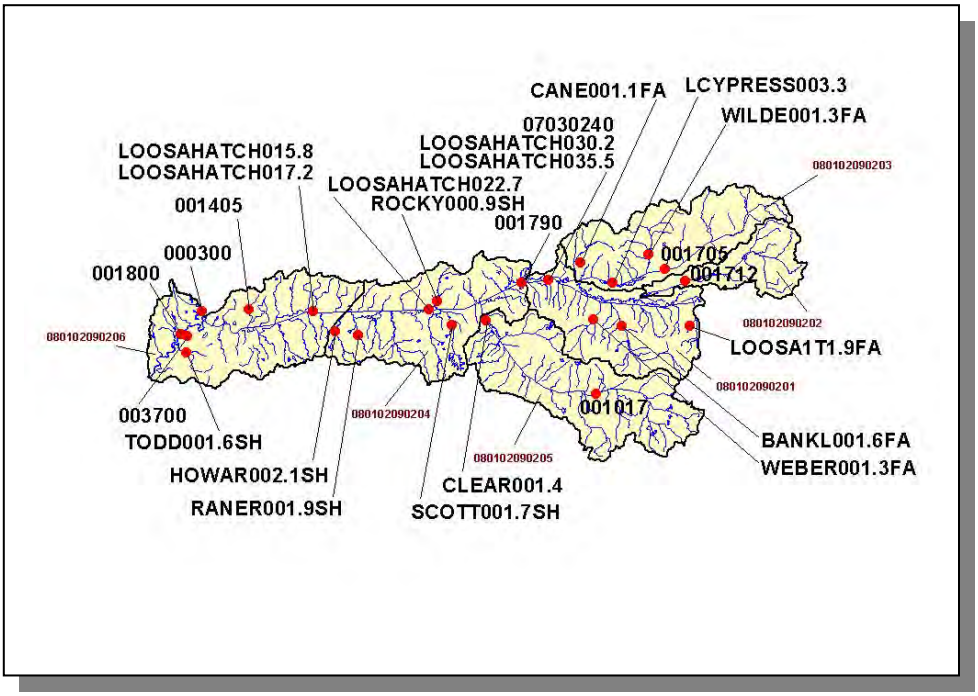


Figure 4-16. Location of STORET Monitoring Sites in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

4.2.B.ii. Point Source Contributions.

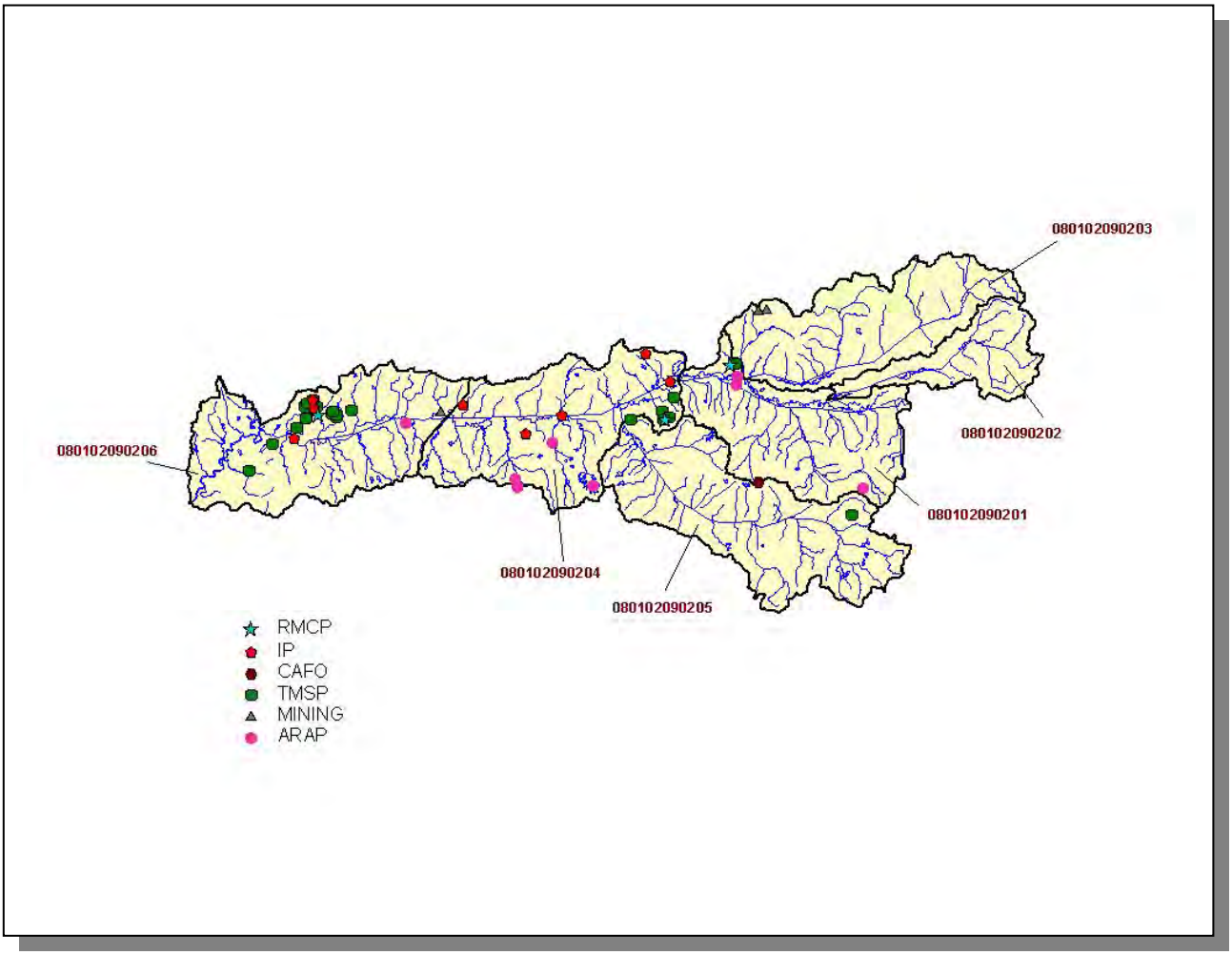


Figure 4-17. Location of Active Point Source Facilities in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information is provided in the following charts.*

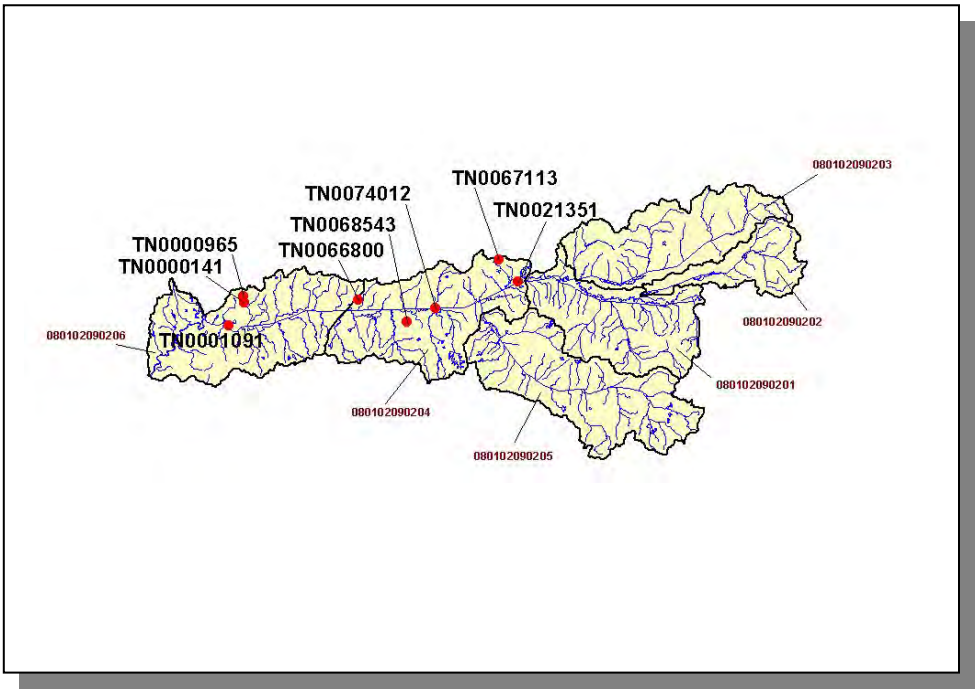


Figure 4-18. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

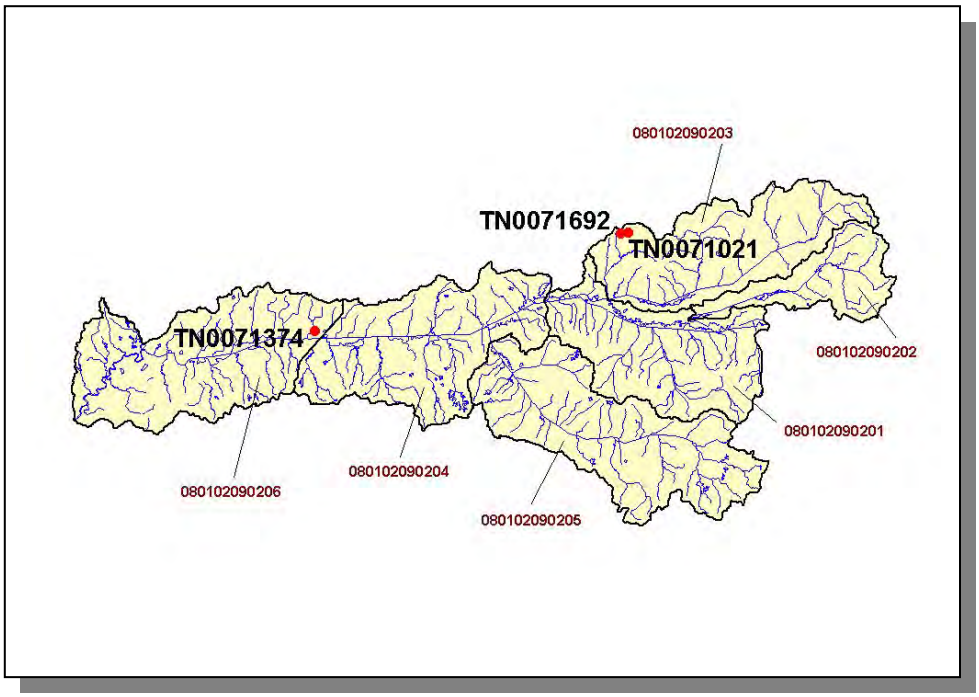


Figure 4-19. Location of Active Mining Sites in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

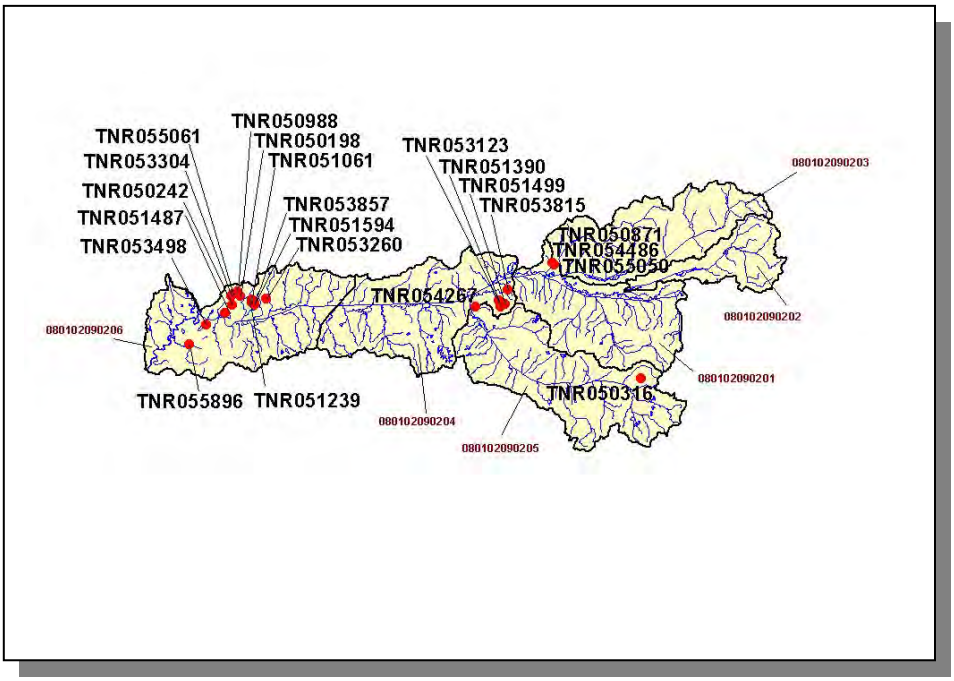


Figure 4-20. Location of TMSP Facilities in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

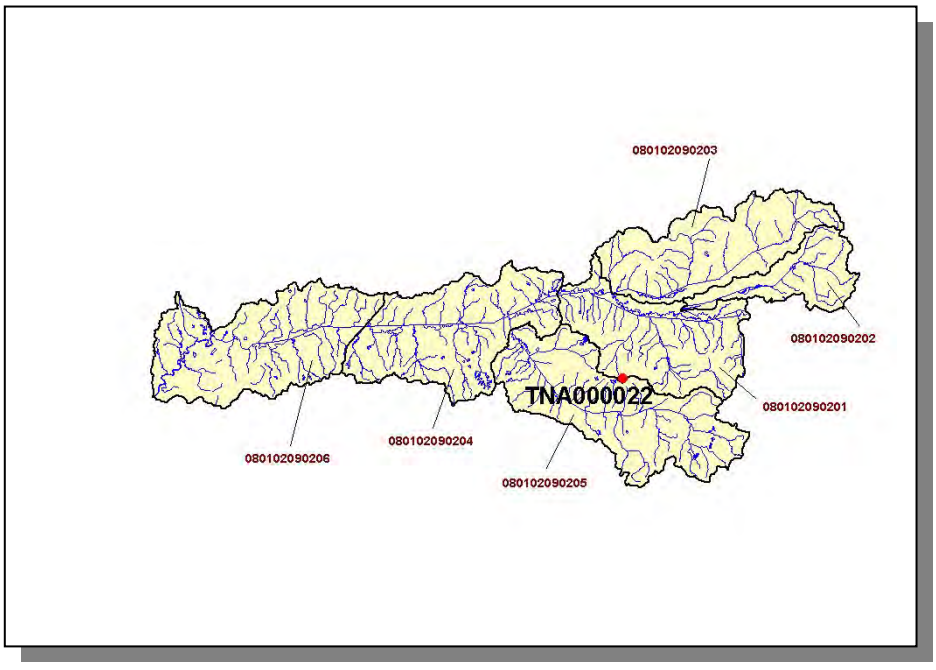


Figure 4-21. Location of CAFO Facilities in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. CAFO rules may be found at http://cfpub.epa.gov/npdes/afo/cafofinalrule.cfm. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

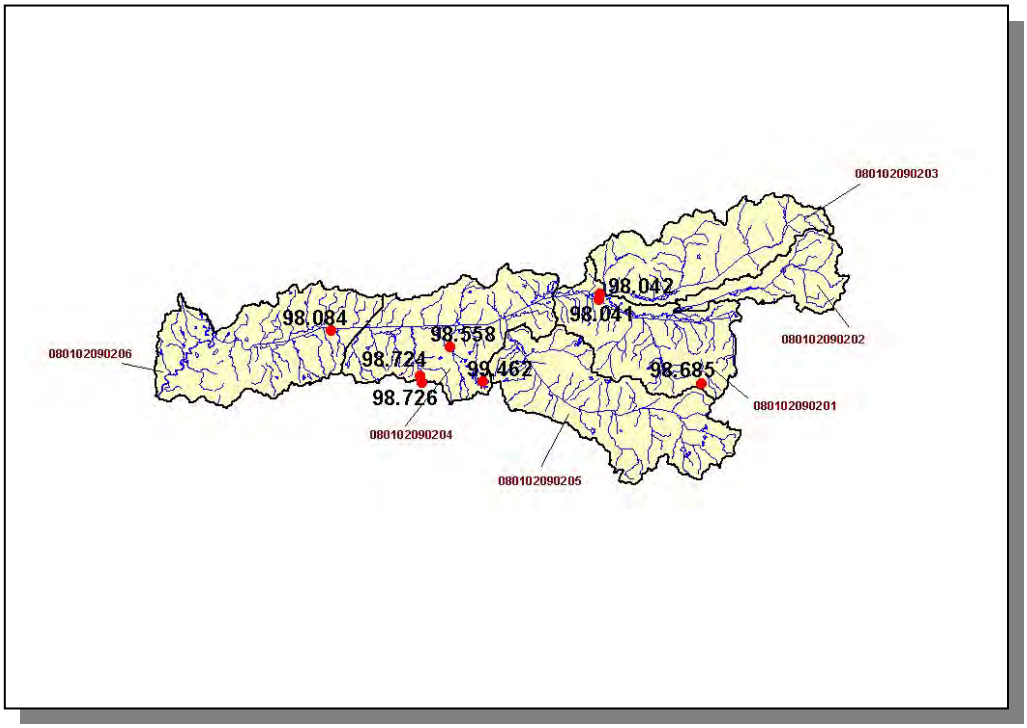


Figure 4-22. Location of ARAP Sites (Individual Permits) in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

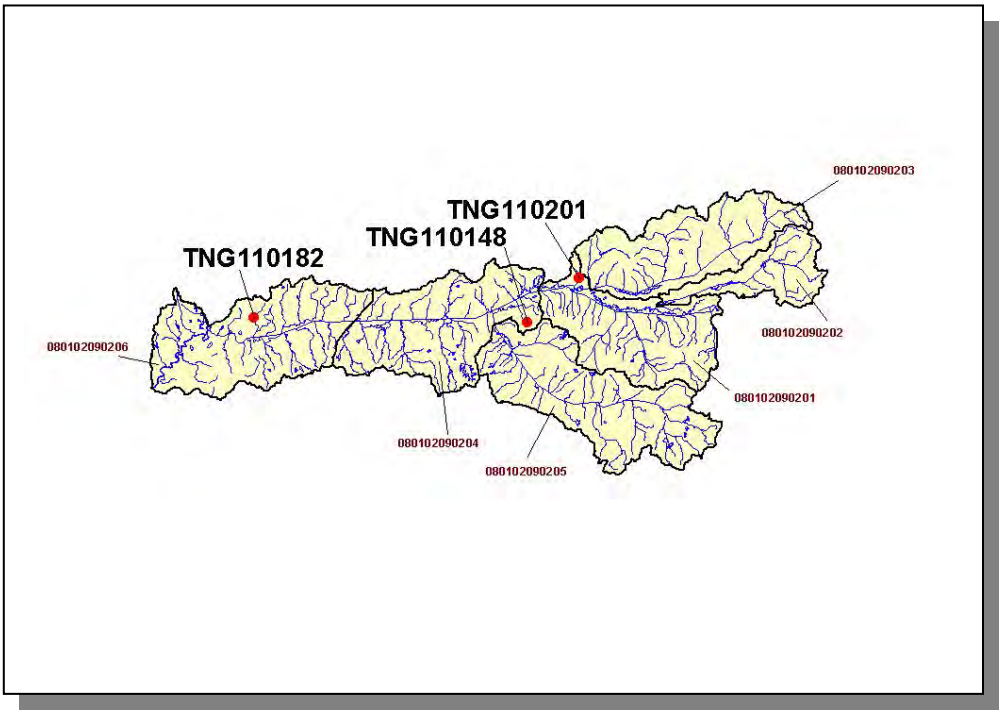


Figure 4-23. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

4.2.A.ii.a. Dischargers to Water Bodies Listed on the 1998 303(d) List

There are six NPDES facilities discharging to water bodies listed on the 1998 303(d) list in Subwatershed 0801020902:

- TN0000141 (PCS Nitrogen fertilizer) discharges to a wet weather conveyance to the Loosahatchie River @ RM 11.7
- TN0000965 (Air Liquide America) discharges to a wet weather conveyance to the Loosahatchie River @ RM 11.8
- TN0001091 (E.I. DuPont and Co.) discharges to the Loosahatchie River @ RM 11.8
- TN0066800 (Bartlett STP #1) discharges to the Loosahatchie River @ RM 18.4
- TN0068543 (Bartlett STP #2) discharges to the Loosahatchie River @ RM 24.0
- TN0074012 (Lakeland Lagoon) discharges to the Loosahatchie River @ RM 24.1

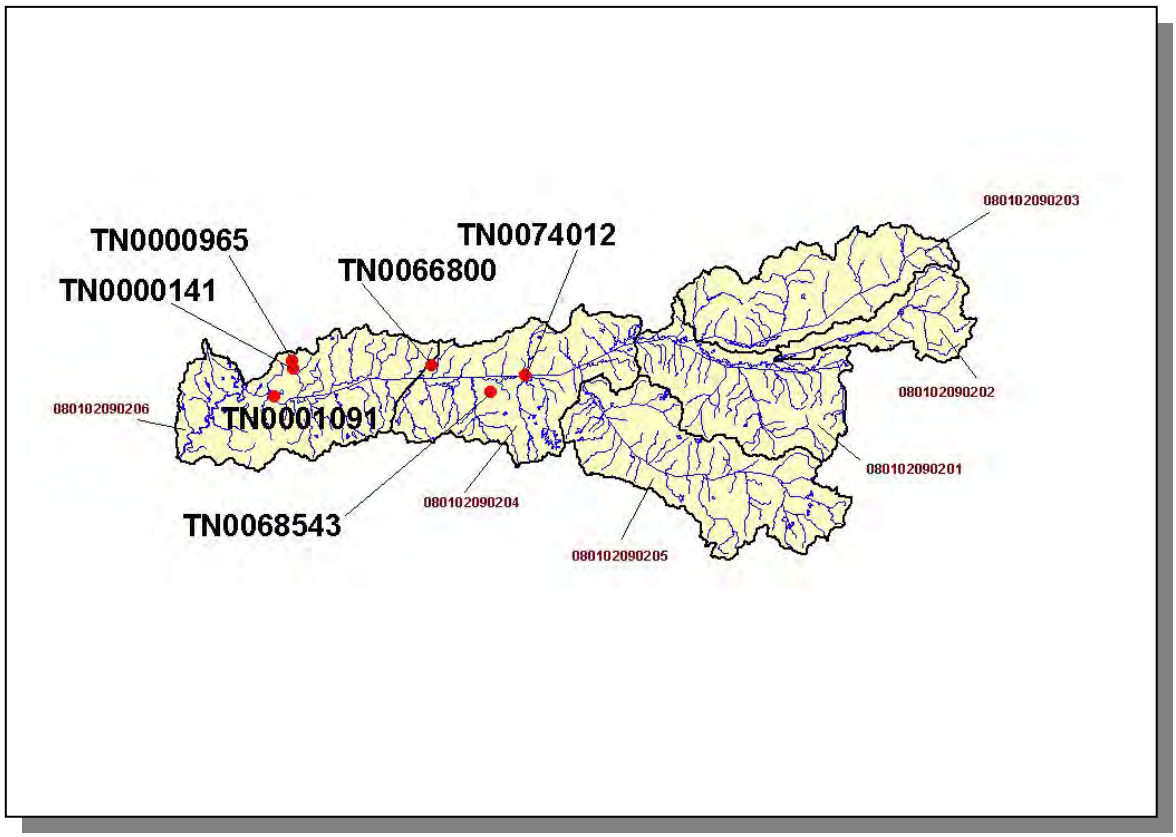


Figure 4-24. Location of NPDES Dischargers to Water Bodies Listed on the 1998 303(d) List in Subwatershed 0801020902. *Subwatershed 080102090201, 080102090202, 080102090203, 080102090204, 080102090205, and 080102090206 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

PERMIT #	1Q10	3Q10	7Q10	3Q20	QDESIGN
TN0000141				32.19	0.38000
TN0000965			37.03		0.01700
TN0001091	36.00	36.32	37.03	32.19	6.12000
TN0066800	36.00	36.32	37.03	32.19	2.20000
TN0068543	36.00	36.32	37.03	32.19	0.50000
TN0074012	36.00	36.32	37.03	32.19	0.50000

Table 4-11. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0801020902. *Data are in million gallons per day (MGD). Data were obtained from the USGS publication Flow Duration and Low Flows of Tennessee Streams Through 1992 or from permit files.*

PERMIT #	$CBOD_5$	BOD_5	pH	WET	NH_3	FECAL	TRC	SETTLEABLE SOLIDS	OIL and GREASE	TSS	DO
TN0000141	X		X	X	X		X		X	X	X
TN0000965			X						X		
TN0001091		X	X	X					X	X	
TN0066800	X		X	X	X	X		X		X	X
TN0068543	X		X			X	X	X		X	X
TN0074012	X		X		X	X	X	X		X	X

Table 4-12. Parameters Monitored for Daily Maximum (mg/L) Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0801020902. *$CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); BOD_5, Biocemical Oxygen Demand (5-Day); WET, Whole Effluent Toxicity; TRC, Total Residual Chlorine; TSS, Total Suspended Solids; DO, Dissolved Oxygen.*

4.2.B.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
4,640	8,548	237	13	0	6,072	74

Table 4-13. Summary of Livestock Count Estimates in Subwatershed 0801020902. *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)
Fayette	152.0	152.0	1.0	3.3
Shelby	111.6	111.6	0.0	0.0
Total	**263.6**	**263.6**	**1.1**	**3.3**

Table 4-14. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0801020902.

CROPS	TONS/ACRE/YEAR
Grass, Forbs, Legumes (Mixed Pasture)	0.51
Grass (Pastureland)	0.39
Legume/Grass (Hayland)	0.22
Legume (Hayland)	2.23
Grass (Hayland)	0.22
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Corn (Row Crops)	13.09
Soybeans (Row Crops)	10.91
Cotton (Row Crops)	9.81
Sorghum (Row Crops)	4.91
Wheat (Close Grown Cropland)	3.46
Summer Fallow (Other Cropland)	12.43
Fruit (Horticulture)	0.39
Conservation Reserve Program Lands	0.61
Other Vegetable and Truck Crops	5.87
All Other Crops not Planted	4.80
Non Agricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.28

Table 4-15. Annual Estimated Total Soil Loss in Subwatershed 0801020902.

4.2.C. 0801020903.

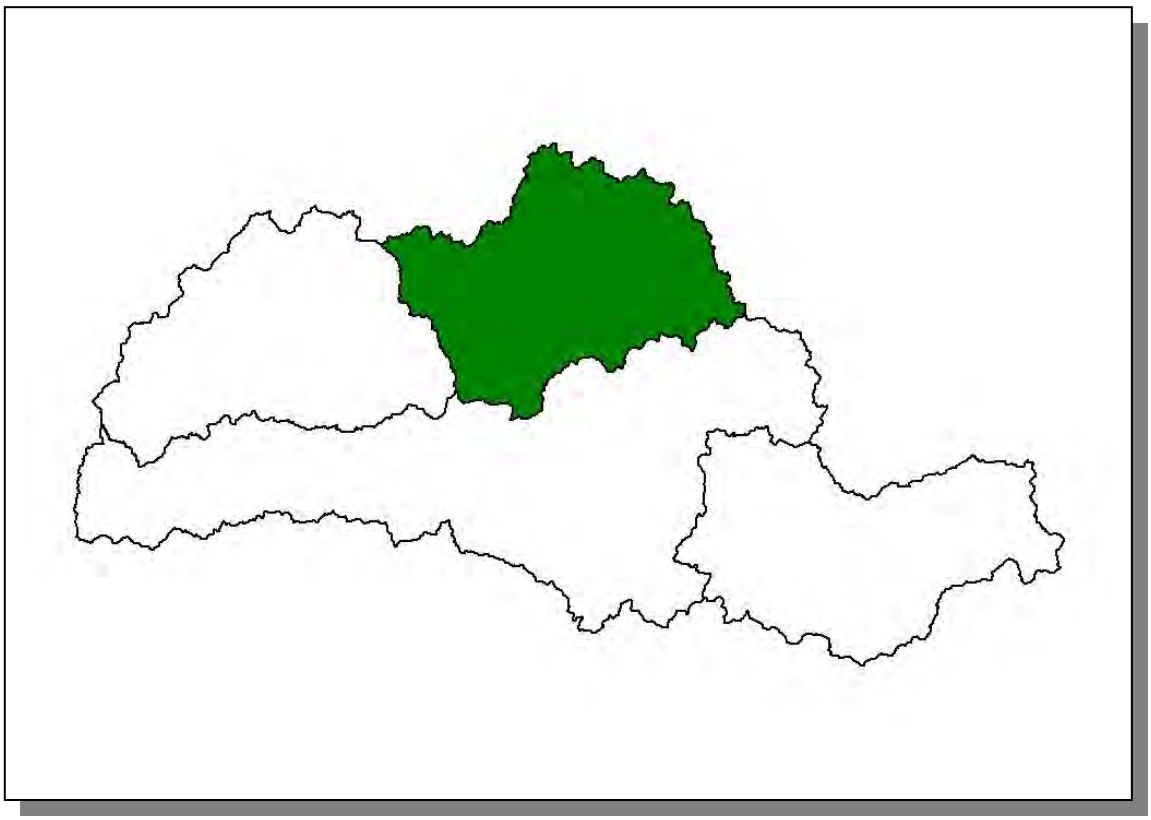


Figure 4-25. Location of Subwatershed 0801020903. *All Loosahatchie HUC-10 subwatershed boundaries are shown for reference.*

4.2.C.i. General Description.

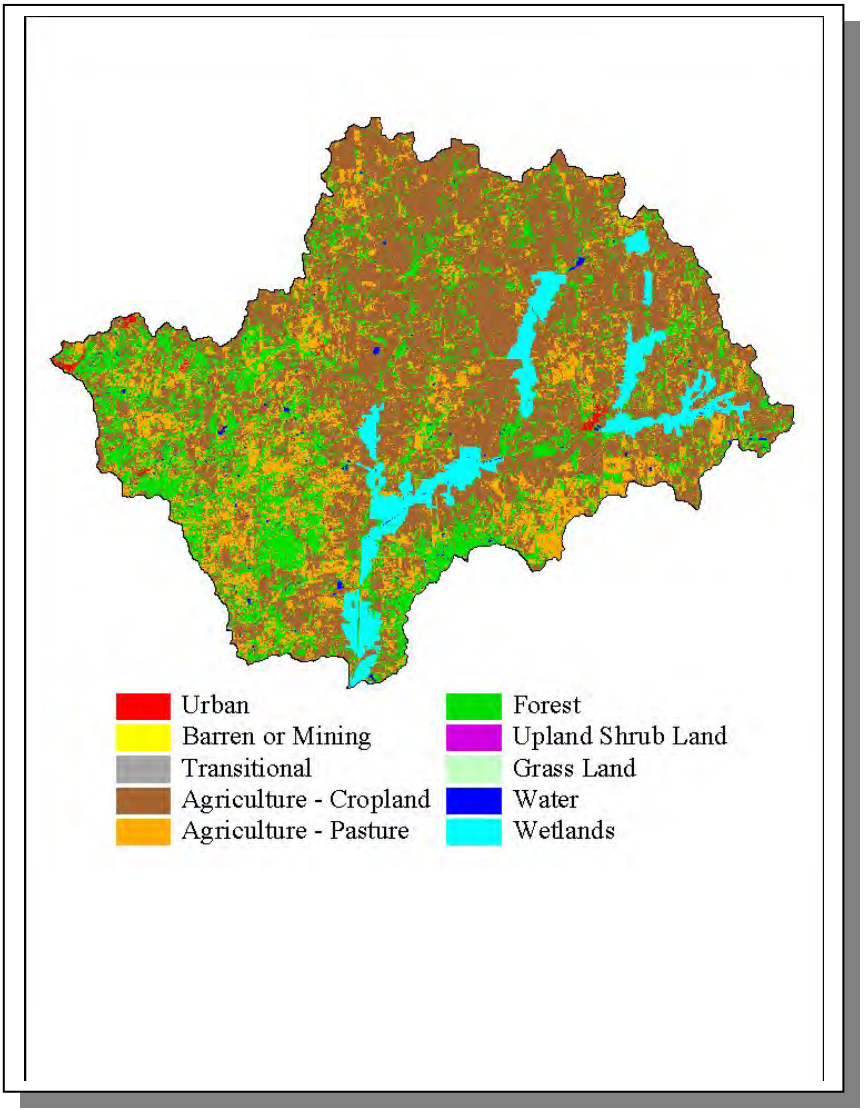


Figure 4-26. Illustration of Land Use Distribution in Subwatershed 0801020903.

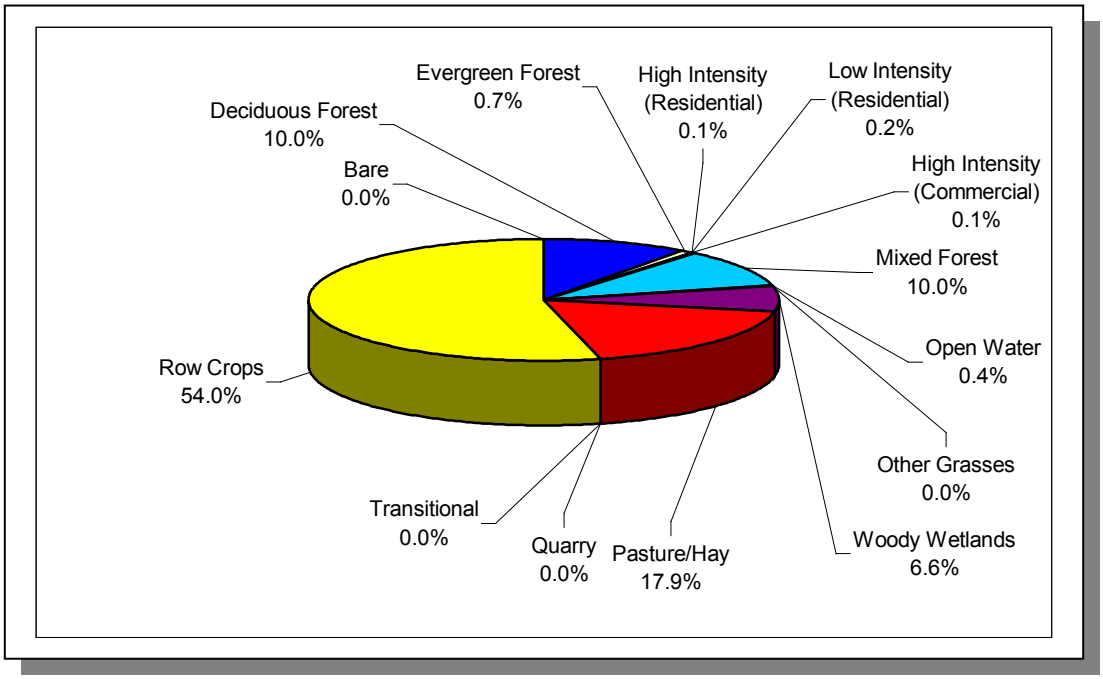


Figure 4-27. Land Use Distribution in Subwatershed 0801020903. *More information is provided in Loosahatchie-Appendix IV.*

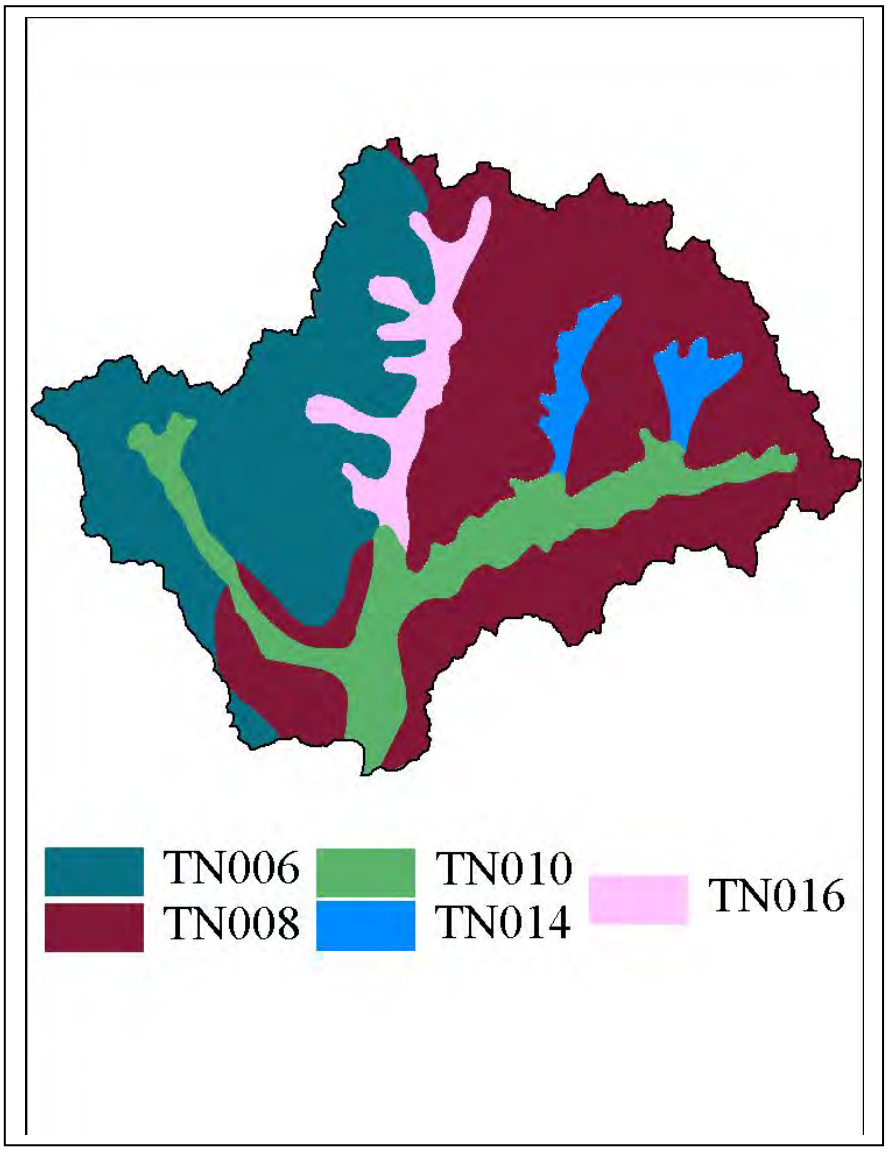


Figure 4-28. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020903.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN006	0.00	C	1.30	5.42	Silty Loam	0.48
TN008	2.00	C	1.38	5.20	Silty Loam	0.48
TN010	81.00	C	1.33	5.11	Silty Loam	0.44
TN014	30.00	C	1.30	5.12	Silty Loam	0.47
TN016	0.00	C	1.30	6.47	Silty Loam	0.44

Table 4-16. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020903. *More information is provided in Loosahatchie-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Fayette	25,559	29,412	3.13	800	920	15.0
Haywood	19,437	19,709	0.38	75	76	1.3
Shelby	826,330	865,318	3.22	26,600	27,855	4.7
Tipton	37,568	45,986	22.53	8,465	10,362	22.4
Total	**908,894**	**960,425**		**35,940**	**39,213**	**9.1**

Table 4-17. Population Estimates in Subwatershed 0801020903.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Atoka	Tipton	648	280	110	169	1
Mason	Tipton	371	154	133	11	10
Munford	Tipton	2,331	894	785	104	5
Braden	Fayette	373	141	6	129	6
Total		**3,723**	**1,469**	**1,034**	**413**	**22**

Table 4-18. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0801020903.

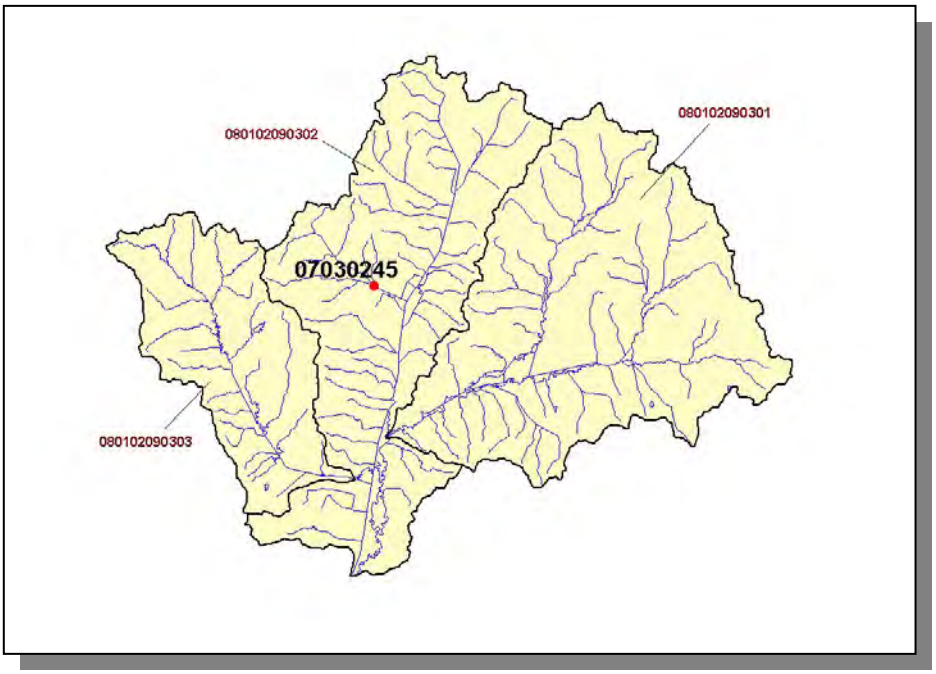


Figure 4-29. Location of Historical Streamflow Data Collection Sites in Subwatershed 0801020903. *Subwatershed 080102090301, 080102090302, and 080102090303 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

Figure 4-30. Location of STORET Monitoring Sites in Subwatershed 0801020903. *Subwatershed 080102090301, 080102090302, and 080102090303 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

4.2.C.ii. Point Source Contributions.

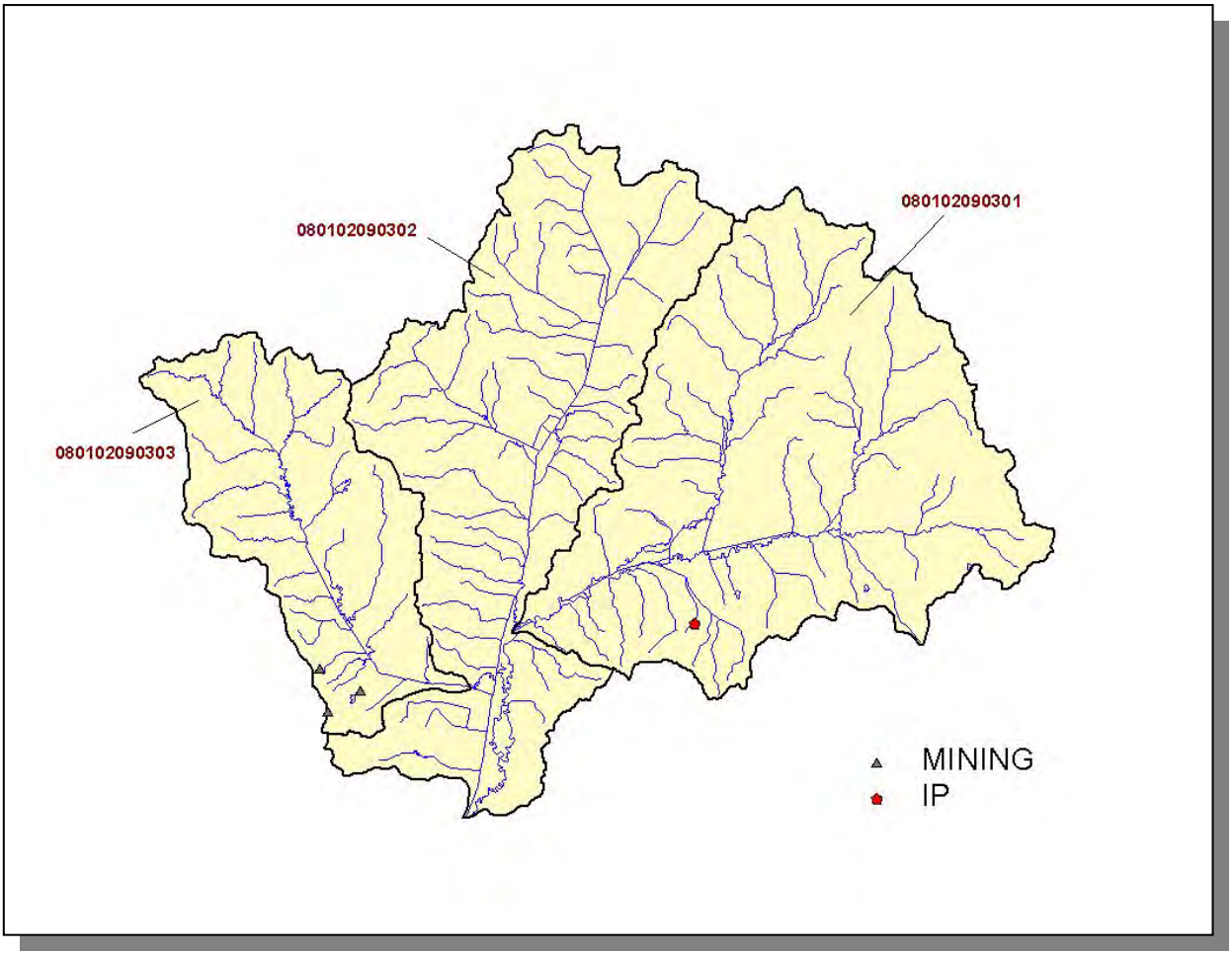


Figure 4-31. Location of Active Point Source Facilities in Subwatershed 0801020903. *Subwatershed 080102090301, 080102090302, and 080102090303 boundaries are shown for reference. More information is provided in the following charts.*

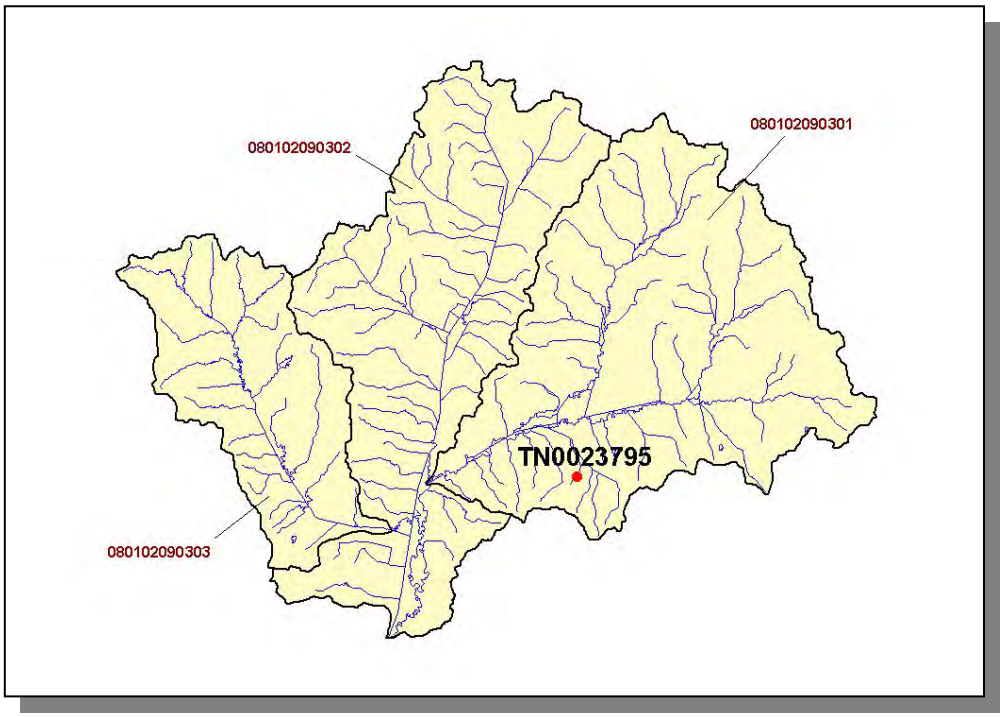


Figure 4-32. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0801020903. *Subwatershed 080102090301, 080102090302, and 080102090303 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

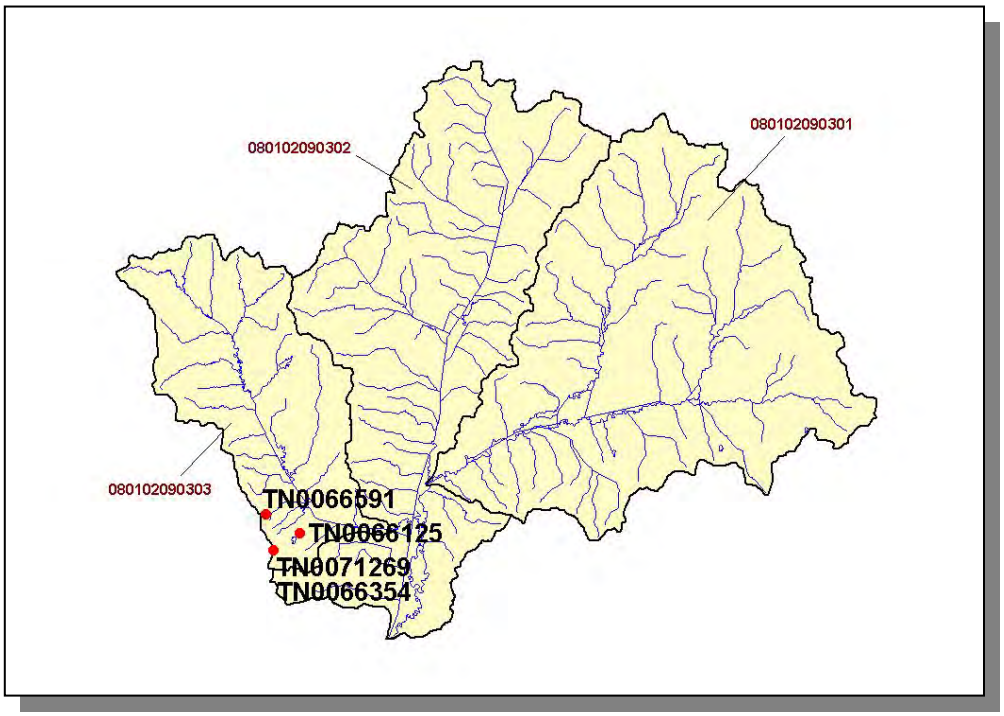


Figure 4-33. Location of Active Mining Sites in Subwatershed 0801020903. *Subwatershed 080102090301, 080102090302, and 080102090303 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

4.2.A.ii.a. Dischargers to Water Bodies Listed on the 1998 303(d) List

There is one NPDES facilities discharging to water bodies listed on the 1998 303(d) list in Subwatershed 0801020903:

- TN0023795 (Northwest School) discharges to an unnamed trib to Beaver Creek @ RM 3.6

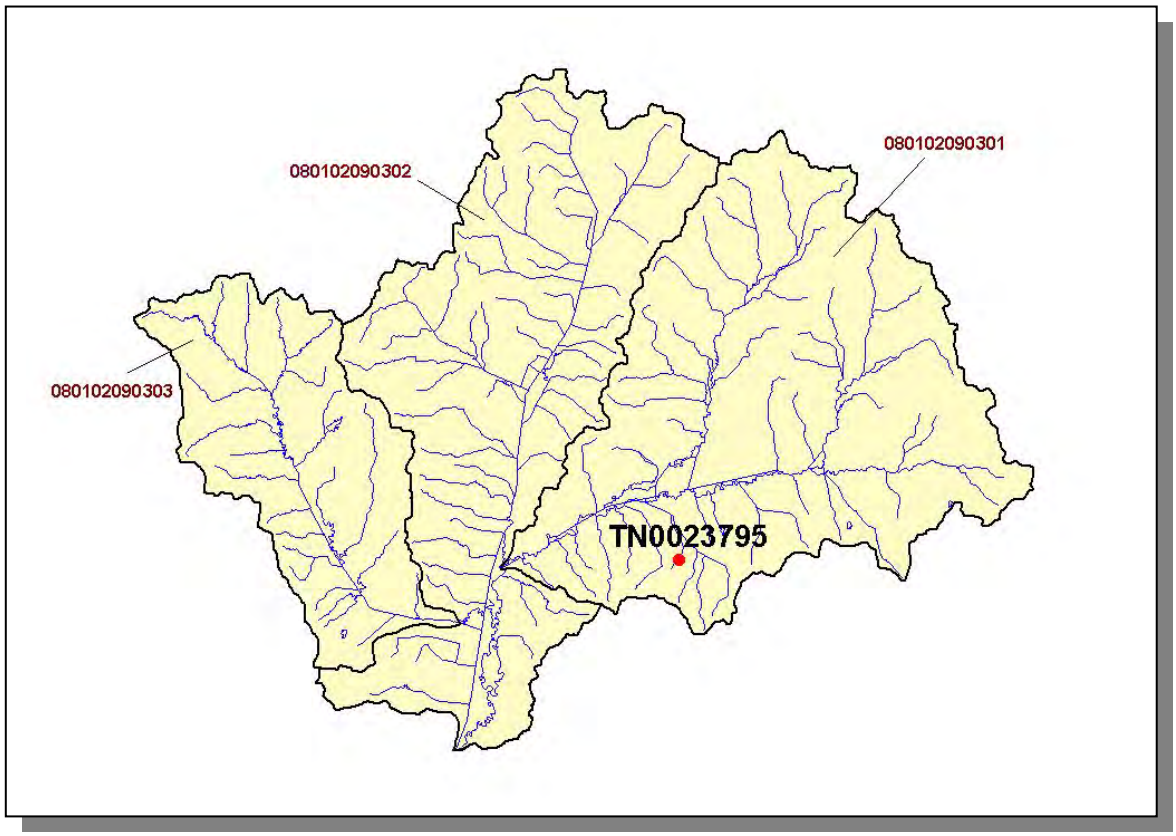


Figure 4-34. Location of NPDES Dischargers to Water Bodies Listed on the 1998 303(d) List in Subwatershed 0801020903. *Subwatershed 080102090301, 080102090302, and 080102090303 boundaries are shown for reference. More information, including the names of facilities, is provided in Loosahatchie-Appendix IV.*

PERMIT #	1Q10	3Q10	7Q10	3Q20	QDESIGN
TN0023795			0.00		0.00670

Table 4-19. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0801020903. *Data are in million gallons per day (MGD). Data were obtained from the USGS publication Flow Duration and Low Flows of Tennessee Streams Through 1992 or from permit files.*

PERMIT #	$CBOD_5$	pH	NH_3	FECAL	TRC	SETTLEABLE SOLIDS	TSS	DO
TN0023795	X	X	X	X	X	X	X	X

Table 4-20. Parameters Monitored for Daily Maximum (mg/L) Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0801020903. *$CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids; DO, Dissolved Oxygen.*

4.2.C.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
2,319	4,198	41	8	0	995	40

Table 4-21. Summary of Livestock Count Estimates in Subwatershed 0801020903. *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)
Fayette	152.0	152.0	1.1	3.3
Haywood	71.2	71.2	1.7	6.4
Shelby	111.6	111.6	0.0	0.0
Tipton	50.9	50.9	1.0	5.6
Totals	**385.7**	**385.7**	**3.8**	**15.3**

Table 4-22. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0801020903.

CROPS	TONS/ACRE/YEAR
Legume (Hayland)	1.17
Grass (Hayland)	1.51
Legume/Grass (Hayland)	0.22
Grass (Pastureland)	0.69
Grass, Forbs, Legumes (Mixed Pasture)	0.83
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Soybeans (Row Crops)	16.13
Corn (Row Crops)	12.07
Cotton (Row Crops)	14.41
Sorghum (Row Crops)	4.84
Wheat (Close Grown Cropland)	3.55
All Other Close Grown Cropland	3.08
Conservation Reserve Program Land	0.92
Fruit (Horticulture)	0.42
Other Vegetable and Truck Crops	18.07
Summer Fallow (Other Cropland)	12.43
Other Land in Farms	0.16
Other Cropland not Planted	1.82
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.56

Table 4-23. Annual Estimated Total Soil Loss in Subwatershed 0801020903.

4.2.D. 0801020904.

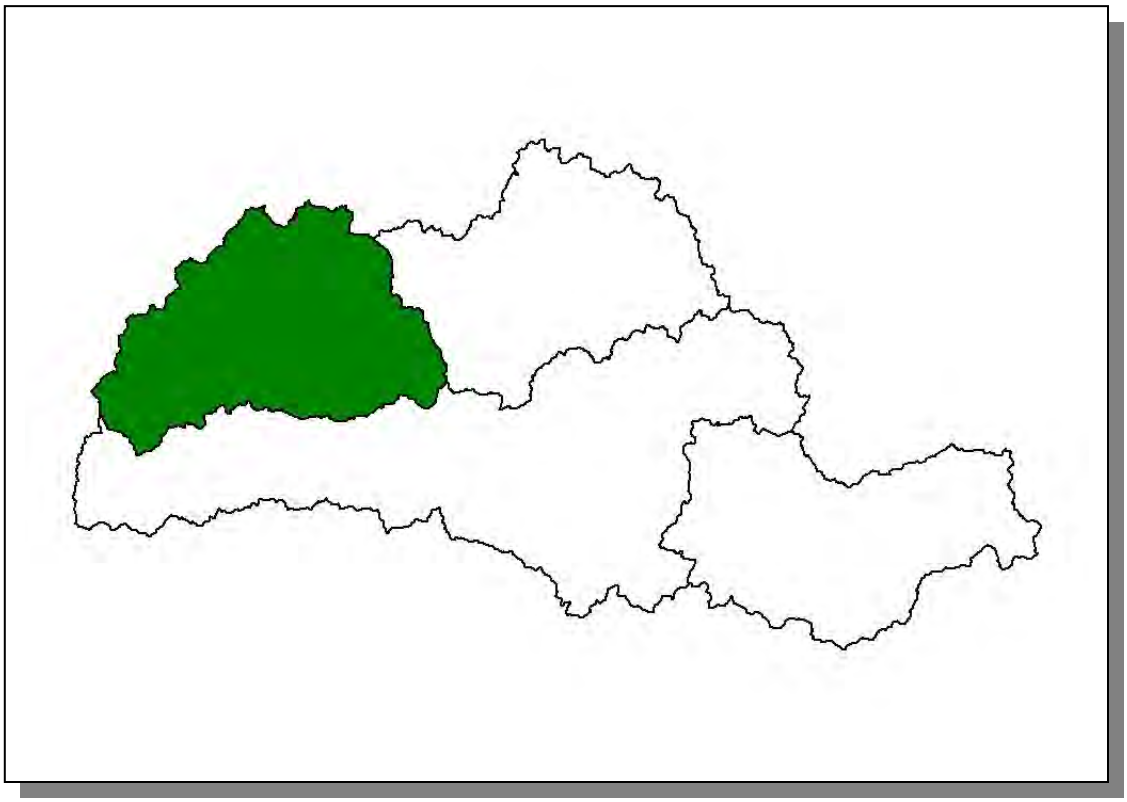


Figure 4-35. Location of Subwatershed 0801020904. *All Loosahatchie River HUC-10 subwatershed boundaries are shown for reference.*

4.2.D.i. General Description.

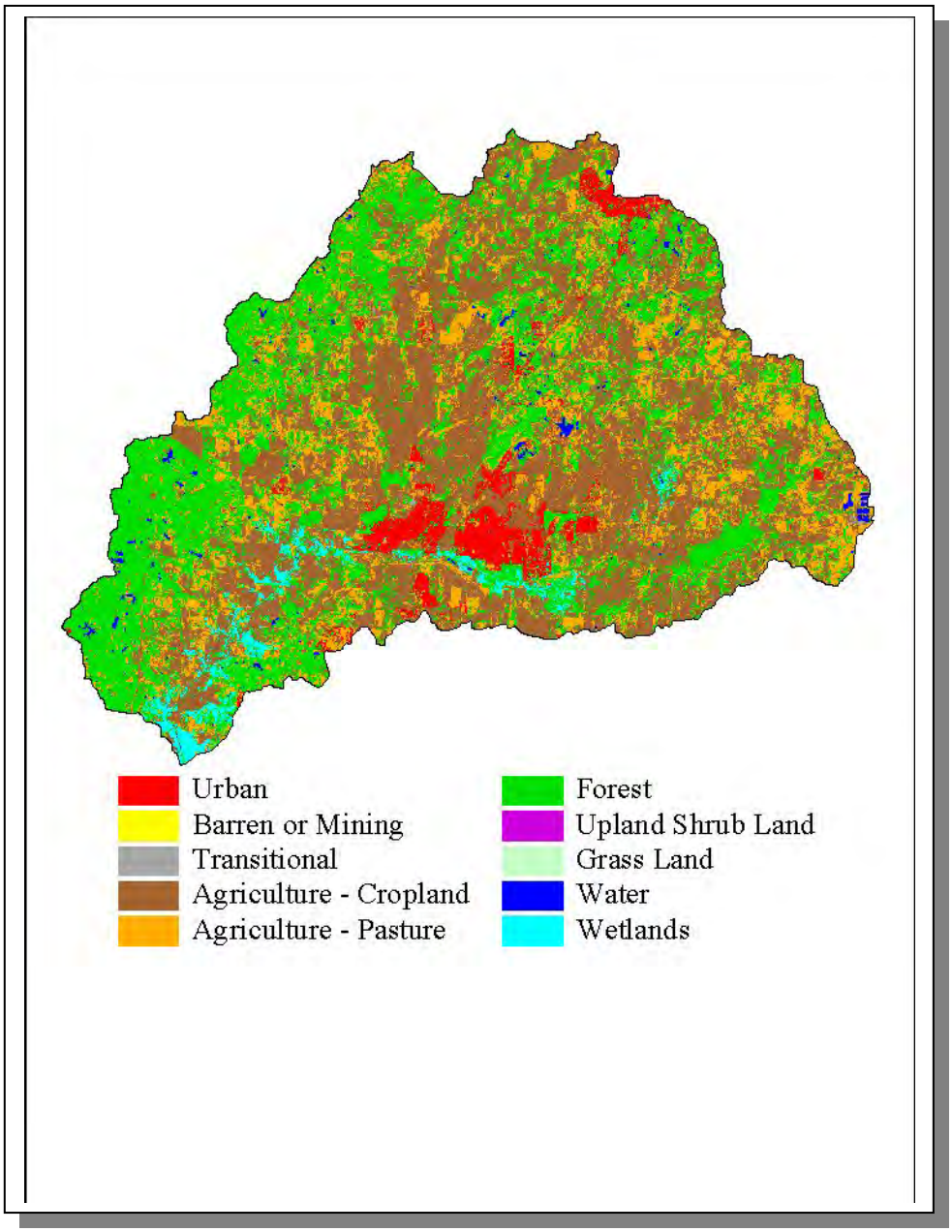


Figure 4-36. Illustration of Land Use Distribution in Subwatershed 0801020904.

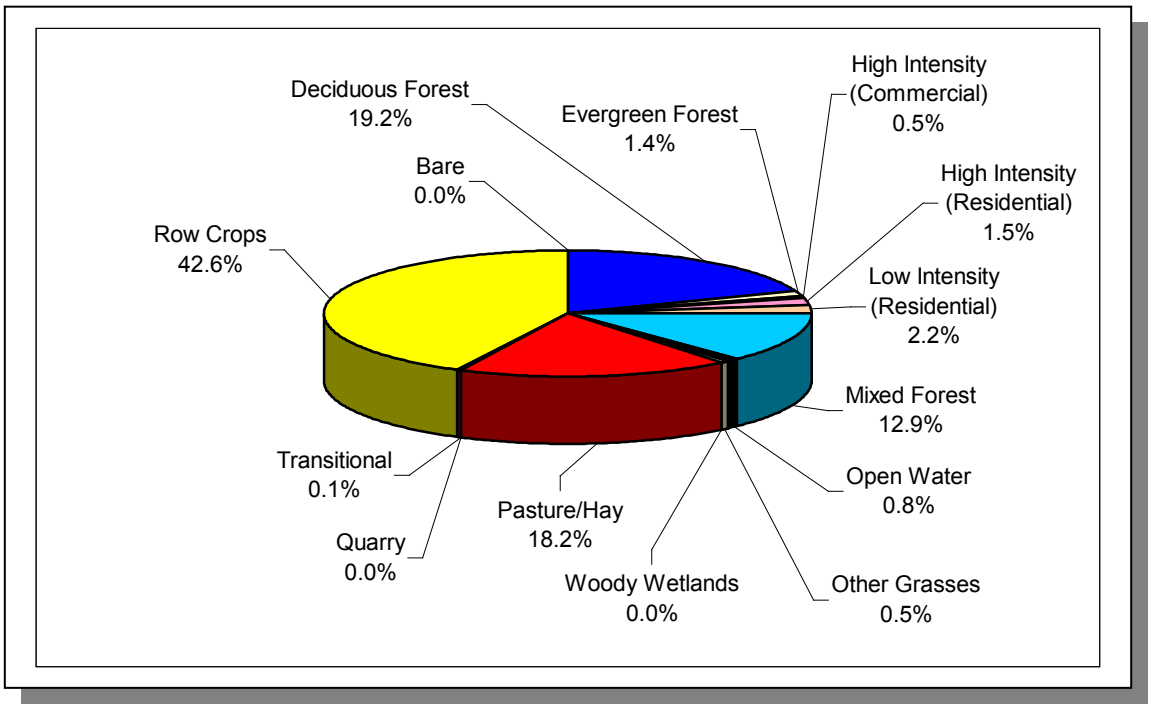


Figure 4-37. Land Use Distribution in Subwatershed 0801020904. *More information is provided in Loosahatchie-Appendix IV.*

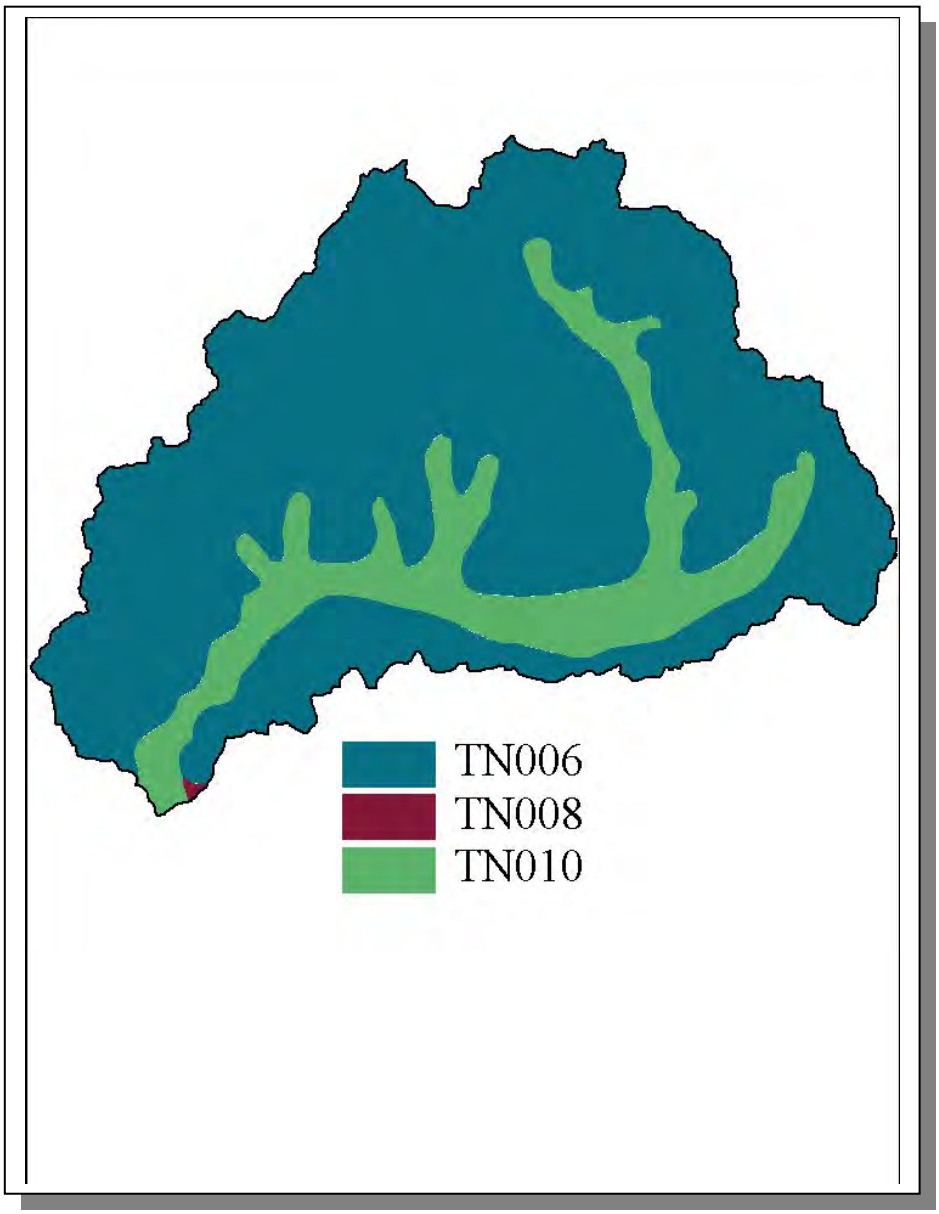


Figure 4-38. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020904.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN006	0.00	C	1.30	5.42	Silty Loam	0.48
TN008	2.00	C	1.38	5.20	Silty Loam	0.48
TN010	81.00	C	1.33	5.11	Silty Loam	0.44

Table 4-24. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0801020904. *More information is provided in Loosahatchie-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		% CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Shelby	826,330	865,318	13.83	114,297	119,690	4.7
Tipton	37,568	45,986	10.07	3,784	4,632	22.4
Total	**863,898**	**911,304**		**118,081**	**124,323**	**5.3**

Table 4-25. Population Estimates in Subwatershed 0801020904.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Atoka	Tipton	648	280	110	169	1
Munford	Tipton	2,331	894	785	104	5
Millington	Shelby	17,866	4,440	4,269	37	134
Total		**20,845**	**5,614**	**5,164**	**310**	**140**

Table 4-26. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0801020904.

Figure 4-39. Location of STORET Monitoring Sites in Subwatershed 0801020904. *Subwatershed 080102090401, 080102090402, and 080102090403 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

4.2.D.ii. Point Source Contributions.

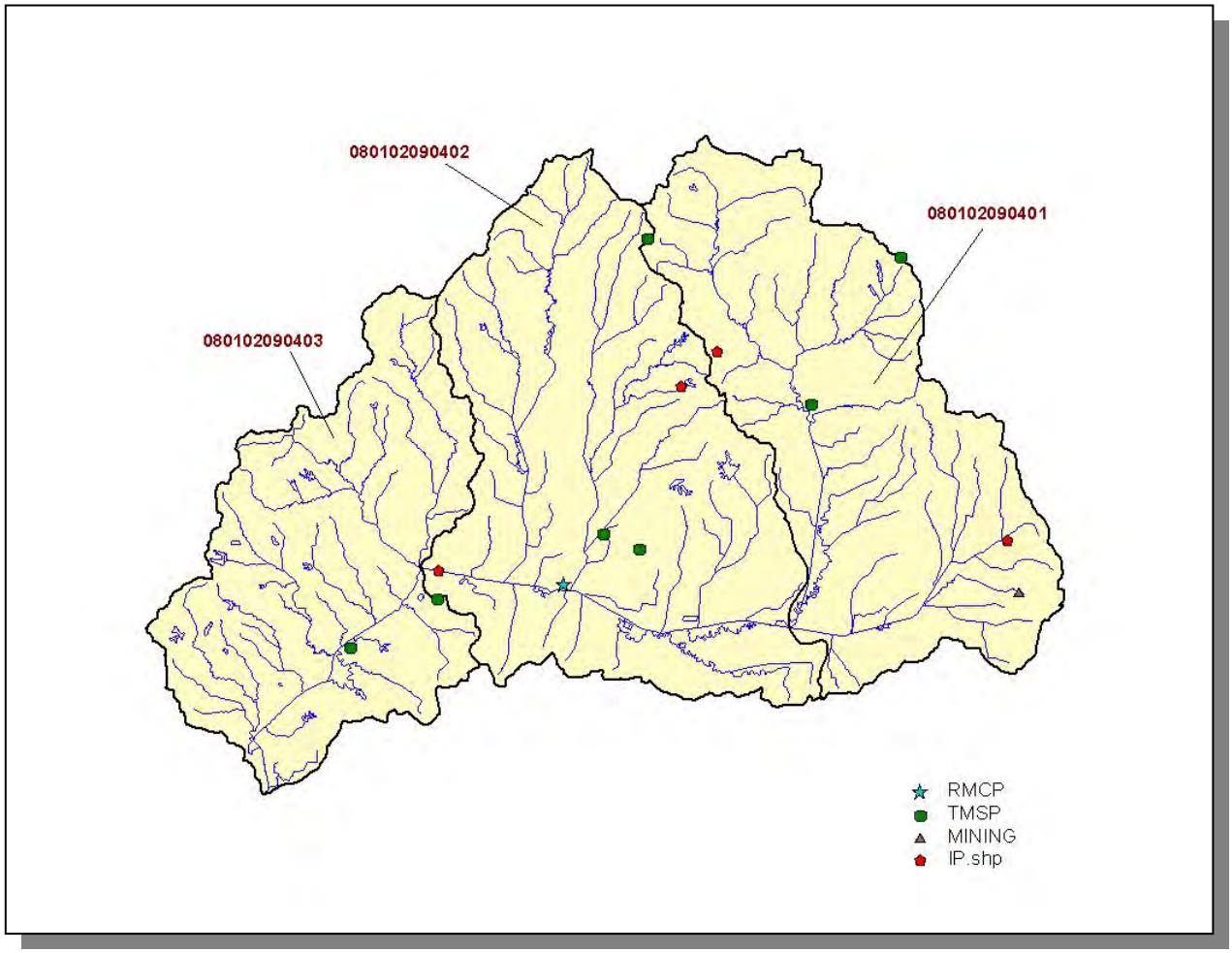


Figure 4-40. Location of Active Point Source Facilities in Subwatershed 0801020904. *Subwatershed 080102090401, 080102090402, and 080102090403 boundaries are shown for reference. More information is provided in the following charts.*

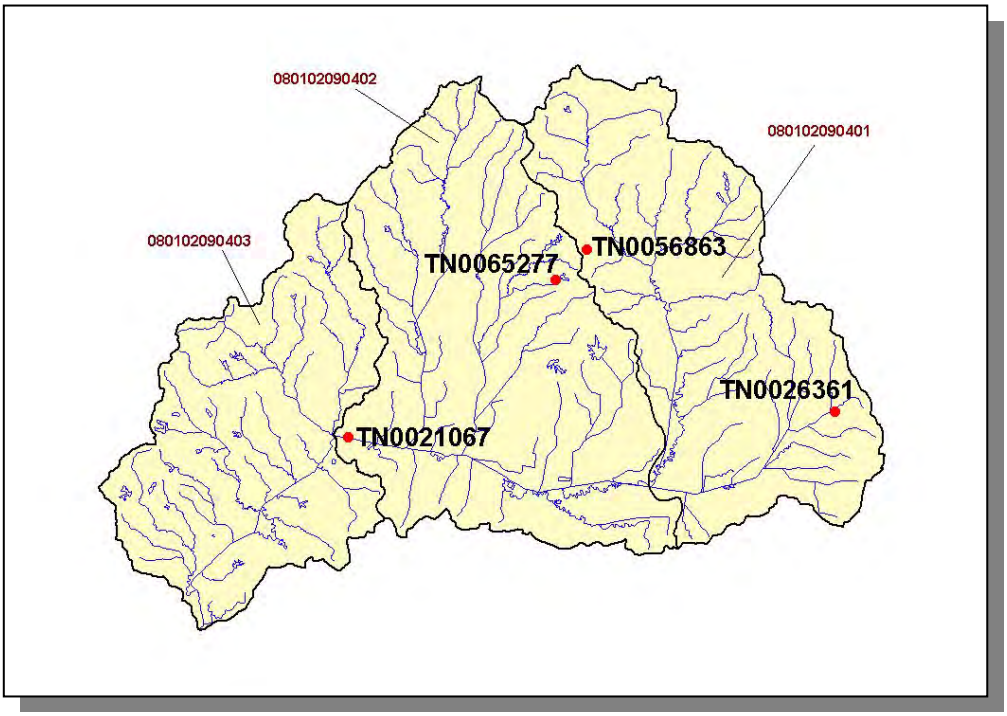


Table 4-27. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0801020904. *Subwatershed 080102090401, 080102090402, and 080102090403 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

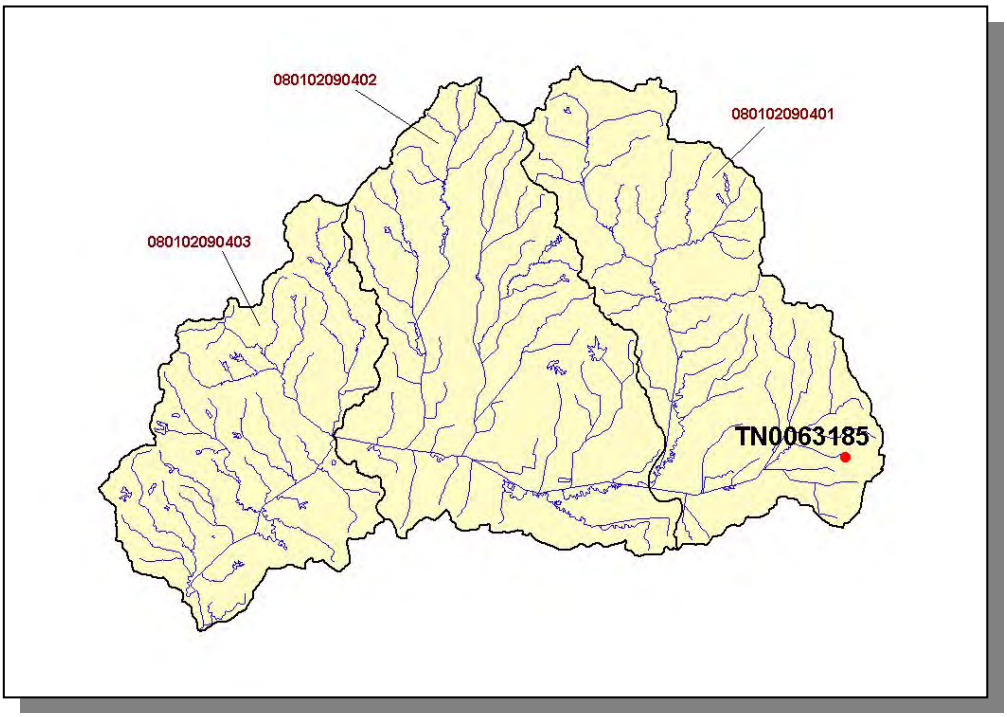


Figure 4-41. Location of Active Mining Sites in Subwatershed 0801020904. *Subwatershed 080102090401, 080102090402, and 080102090403 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

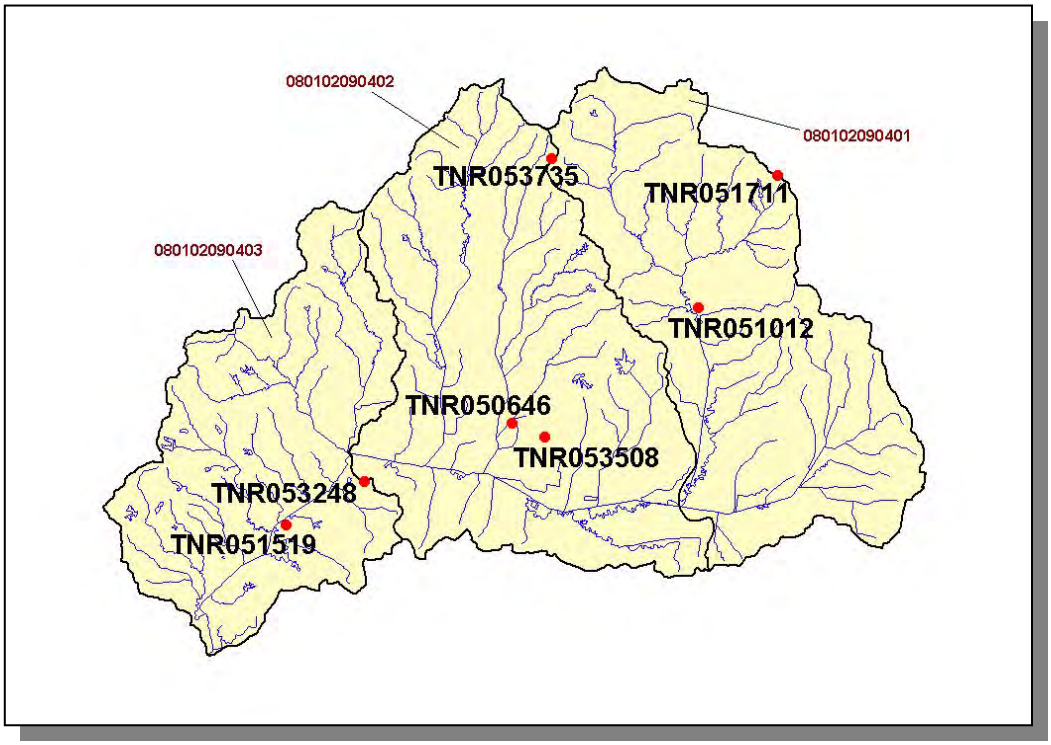


Figure 4-42. Location of TMSP Facilities in Subwatershed 0801020904. *Subwatershed 080102090401, 080102090402, and 080102090403 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

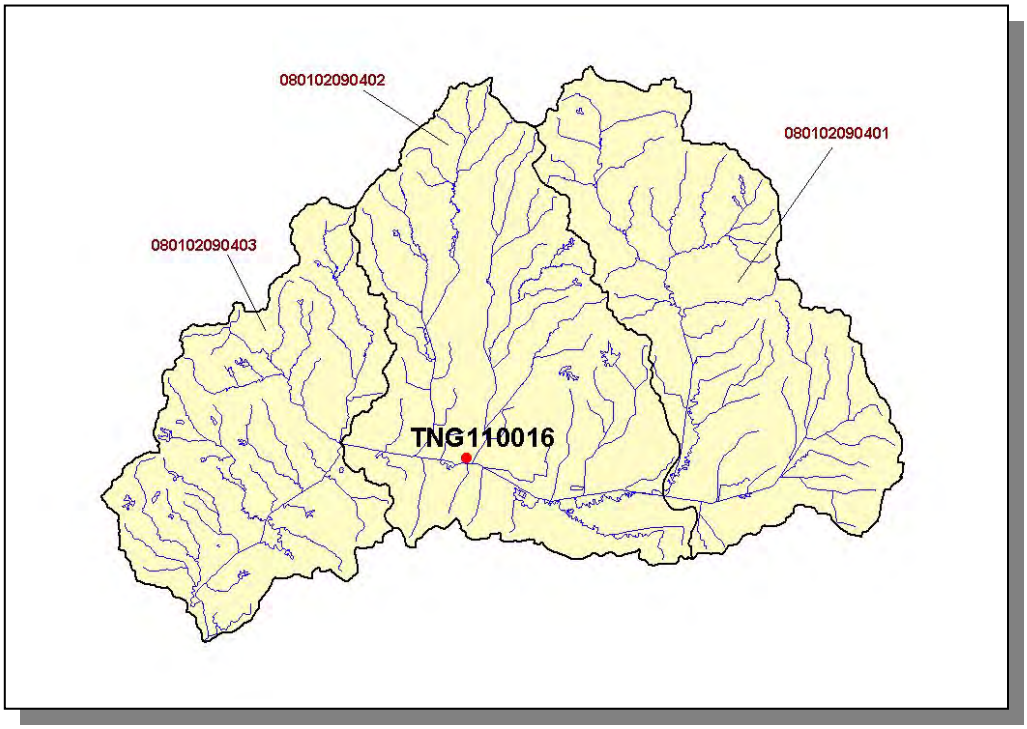


Figure 4-43. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 0801020904. *Subwatershed 080102090401, 080102090402, and 080102090403 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

4.2.A.ii.a. Dischargers to Water Bodies Listed on the 1998 303(d) List

There is one NPDES facility discharging to water bodies listed on the 1998 303(d) list in Subwatershed 0801020904:

- TN0021067 (Millington STP #2) discharges to Big Creek @ RM 6.9

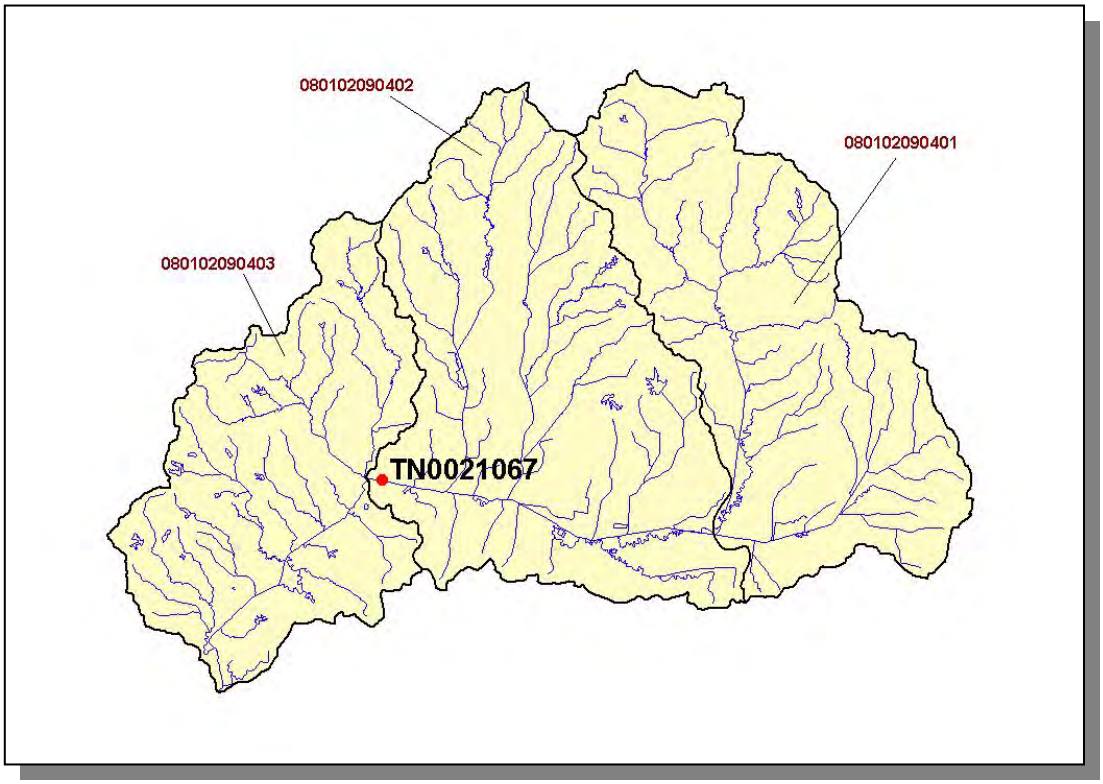


Figure 4-44. Location of NPDES Dischargers to Water Bodies Listed on the 1998 303(d) List in Subwatershed 0801020904. *Subwatershed 080102090401, 080102090402, and 080102090403 boundaries are shown for reference. More information is provided in Loosahatchie-Appendix IV.*

PERMIT #	1Q10	3Q10	7Q10	3Q20	QDESIGN
TN0021067	1.98	2.04	2.09	1.87	5.80000

Table 4-28. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0801020904. *Data are in million gallons per day (MGD). Data were obtained from the USGS publication Flow Duration and Low Flows of Tennessee Streams Through 1992 or from permit files.*

PERMIT #	P
TN0021067	X

Table 4-29. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0801020904.

PERMIT #	$CBOD_5$	pH	WET	NH_3	FECAL	TRC	SETTLEABLE SOLIDS	TSS	DO
TN0021067	X	X	X	X	X	X	X	X	X

Table 4-30. Parameters Monitored for Daily Maximum (mg/L) Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0801020904. *$CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); WET, Whole Effluent Toxicity; TRC, Total Residual Chlorine); TSS, Total Suspended Solids; DO, Dissolved Oxygen.*

4.2.D.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Milk Cow	Cattle	Chickens	Chickens Sold	Hogs	Sheep
2,126	14	3,737	11	0	128	53

Table 4-31. Summary of Livestock Count Estimates in Subwatershed 0801020904. *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)
Shelby	111.6	111.6	0.0	0.0
Tipton	50.9	50.9	1.0	5.6
Total	**162.5**	**162.5**	**1.0**	**5.6**

Table 4-32. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0801020904.

CROPS	TONS/ACRE/YEAR
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Corn (Row Crops)	5.91
Soybeans (Row Crops)	14.00
Cotton (Row Crops)	12.36
Sorghum (Row Crops)	4.91
Wheat (Close Grown Cropland)	4.24
Grass (Hayland)	0.67
Legume (Hayland)	3.35
Grass (Pastureland)	0.50
Grass, Forbs, Legumes (Mixed Pasture)	0.46
Conservation Reserve Program Land	0.87
Other Vegetable and Truck Crop	10.38
Summer Fallow (Other Cropland)	12.43
Other Cropland not Planted	6.04
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.52

Table 4-33. Annual Soil Loss in Subwatershed 0801020904.

CHAPTER 5

WATER QUALITY PARTNERSHIPS IN THE LOOSAHATCHIE 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 Loosahatchie 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 Measurement System (PRMS) 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 PRMS may be viewed at http://prms.nrcs.usda.gov/prms. From the opening menu, select "Reports," then select the Conservation Treatment of interest on the page that comes up. Select the desired location and time period from the drop down menus and choose "Refresh." Choose "by HUC" in the "Location" option and choose "Refresh" again.

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	TOTAL
Comprehensive Nutrient Management Plans (Number)	0
Conservation Buffers (Acres)	486
Erosion Reduction (Tons/Year)	5,708
Inventory and Evaluations (Number)	9
Irrigation Management (Acres)	137
Nutrient Management (Acres)	4,040
Pest Management (Acres)	4,558
Prescribed Grazing (Acres)	189
Residue Management (Acres)	3,464
Tree and Shrub Practices (Acres)	208
Waste Management (Number)	0
Wetlands Created, Restored, or Enhanced (Acres)	**0**
Wildlife Habitat (Acres)	**2,788**

Table 5-1. Landowner Conservation Practices in Partnership with NRCS in Loosahatchie River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2002 reporting period. More information is provided in Loosahatchie-Appendix V.*

5.2.B. United States Geological Survey Water Resources Programs – Tennessee District**.** The U.S. Geological Survey (USGS) provides relevant and objective scientific studies and information for public use to evaluate the quantity, quality, and use of the Nation's water resources. In addition to providing National assessments, the USGS also conducts hydrologic studies in cooperation with numerous Federal, State, and local agencies to address issues of National, regional, and local concern. Please visit http://water.usgs.gov/ for an overview of the USGS, Water Resources Discipline.

The USGS collects hydrologic data to document current conditions and provide a basis for understanding hydrologic systems and solving hydrologic problems. In Tennessee,

the USGS records streamflow continuously at more than 89 gaging stations equipped with recorders and makes instantaneous measurements of streamflow at many other locations. Ground-water levels are monitored Statewide, and the physical, chemical, and biologic characteristics of surface and ground waters are analyzed. USGS activities also include the annual compilation of water-use records and collection of data for National baseline and water-quality networks. National programs conducted by the USGS include the National Atmospheric Deposition Program (http://bqs.usgs.gov/acidrain/), National Stream Quality Accounting Network (http://water.usgs.gov/nasqan/), and the National Water-Quality Assessment Program (http://water.usgs.gov/nawqa/).

USGS Water Resources Information on the Internet. Real-time and historical streamflow, water levels, and water-quality data at sites operated by the Tennessee District can be accessed 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. Contact Donna Flohr at (615) 837-4730 or dfflohr@usgs.gov for specific information about streamflow data.

Recent publications by the USGS staff in Tennessee can be accessed by visiting http://tn.water.usgs.gov/pubpg.html. This web page provides searchable bibliographic information to locate reports and other products about specific areas.

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. For a complete listing of endangered and threatened species in the Loosahatchie River watershed, please visit the Service's website at http://www.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 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 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, al 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://www.cookeville.fws.gov.

5.2.D. Unites States Army Corps of Engineers-Memphis District. Memphis is one of six districts in the Mississippi Valley Division of the Corps of Engineers. The District's area of responsibility encompasses 25,000 square miles, portions of six states, 15 major drainage basins, and approximately 3 million citizens. Responsibilities also include

maintaining a 355-mile, 9-feet deep, and 300-feet wide Mississippi River channel from Cairo, Illinois to the mouth of the White River in Arkansas.

The Memphis District serves the Nation by planning, designing, constructing and operating high quality and reasonably priced Civil Works water resource projects, primarily in the major mission areas of flood damage reduction, navigation, and environmental restoration and stewardship. The Corps' ongoing Civil Works responsibilities date back to the early 1800's when Congress authorized the removal of navigation hazards and obstacles in the early years of the nation's development. Over the years, succeeding Administrations and Congresses have expanded the Corps' missions to include most all water-related planning, development, and construction areas where a Federal interest is involved. Funds for Civil Works are provided through annual Energy and Water Appropriations Acts and through contributions from non-Federal entities for planning and /or construction of specific projects. All Civil Works projects involve a non-Federal, cost sharing sponsor.

Civil Works projects may also be funded under the Continuing Authorities Program (CAP). Congress has provided the Corps with standing authorities to study and build specific water resource projects for specific purposes and with specified spending limits. The CAP projects are implemented in a faster time frame, are limited in complexity, have Federal cost limits determined by the specific authority, are approved by the Division Commander, and do not need Congressional authorization.

The Memphis District has recently completed a Reconnaissance Report on Big Creek a tributary to the Looshatchie River. Big Creek is suffering from degraded water quality, erosion, limited flows during dry periods, high "flashy" flows during storm events, and headcutting. These problems are threatening existing infrastructure (bridges, and utilities), encroaching on a flood protection levee, and degrading water quality entering the Loosahatchie and eventually the Mississippi River.

If funds are provided, the Memphis District would conduct a feasibility report to determine if there is a Federal interest to conduct a project on Big Creek. The project would involve detailed economic, environmental, and engineering studies.

To obtain additional information about the District, please refer to the home page at: http://www.mvm.usace.army.mil, or contact the following offices:

Public Affairs Office (General Information):	(901) 544-3348
Regulatory Branch:	(901) 544-3473
Planning, Programs, and Project Management Branch:	(901) 544- 0658
Continuing Authorities Program:	(901) 544-0798
Environmental Analysis Branch:	(901) 544-3857

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 are 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.

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.

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 Loosahatchie River Watershed was funded under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program, and the U.S. Environmental Protection Agency Assistance Agreements C9994674-99-0, C9994674-00-0, and C9994674-01-0.

- 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 about the joint policy to address Bad Actors in forestry operations is available at http://www.state.tn.us/environment/news/release/jan99/badact.htm

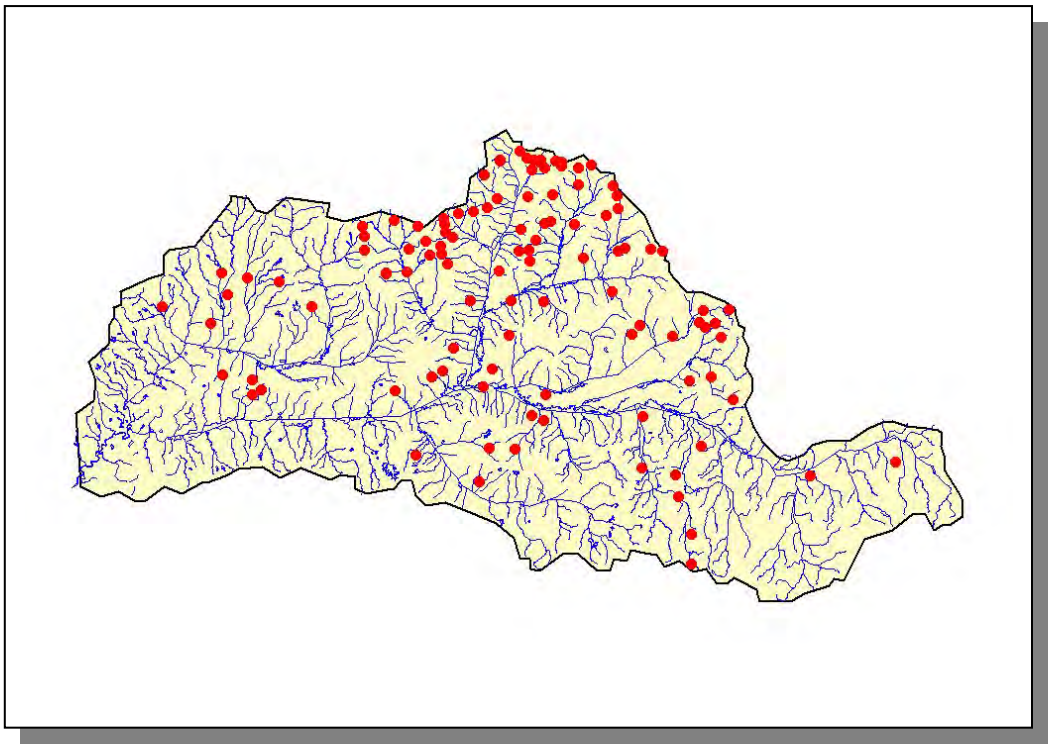


Figure 5-1. Location of BMPs installed from 1999 through 2002 in the Loosahatchie River Watershed with Financial Assistance from the Tennessee Department of Agriculture's Nonpoint Source and Agricultural Resources Conservation Fund Grant Programs.

CHAPTER 6

FUTURE DIRECTIONS IN THE LOOSAHATCHIE 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 stormwater rules (implemented under the NPDES program) are transitioning from Phase 1 to Phase 2. More information on stormwater rules may be found at: http://www.state.tn.us/environment/wpc/stormh2o/MS4.htm.

This Chapter addresses point and nonpoint source approaches to water quality problems in the Loosahatchie River Watershed as well as specific NPDES permittee information.

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 frequently 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/public.htm.

6.2.A. Year 1 Public Meeting. The first Loosahatchie River Watershed public meeting was held April 14, 1997 in Bartlett City Hall. 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 nongovernment organization partners, 3)review water quality monitoring strategies, and 4)solicit input from the public.

Major Concerns/EFO Comments

- Something needs to be done for urban BMPs similar to agricultural BMPs
- Lakeland STP has been in violation of their permit for years, yet they are allowed to continue to discharge
- TDEC needs to interact with other agencies
- The effect of the Watershed Approach on current permitees
- Developers and city planners need to work together for long range planning
- There is a need for public education about good environmental practices
- There is a need for consistency and fairness in issuing ARAP permits

6.2.B. Year 5 Public Meeting. The third scheduled Loosahatchie River Watershed public meeting was held October 7, 2003 at the Lakeland City Hall. The meeting featured six educational components:

- Overview of draft Watershed Water Quality Management Plan slide show
- Benthic macroinvertebrate samples and interpretation
- SmartBoard™ with interactive GIS maps
- “How We Monitor Streams” self-guided slide show
- “Why We Do Biological Sampling” self-guided slide show
- City of Lakeland display

In addition, citizens had the opportunity to make formal comments on the draft Watershed Water Quality Management Plan and to rate the effectiveness of the meeting.

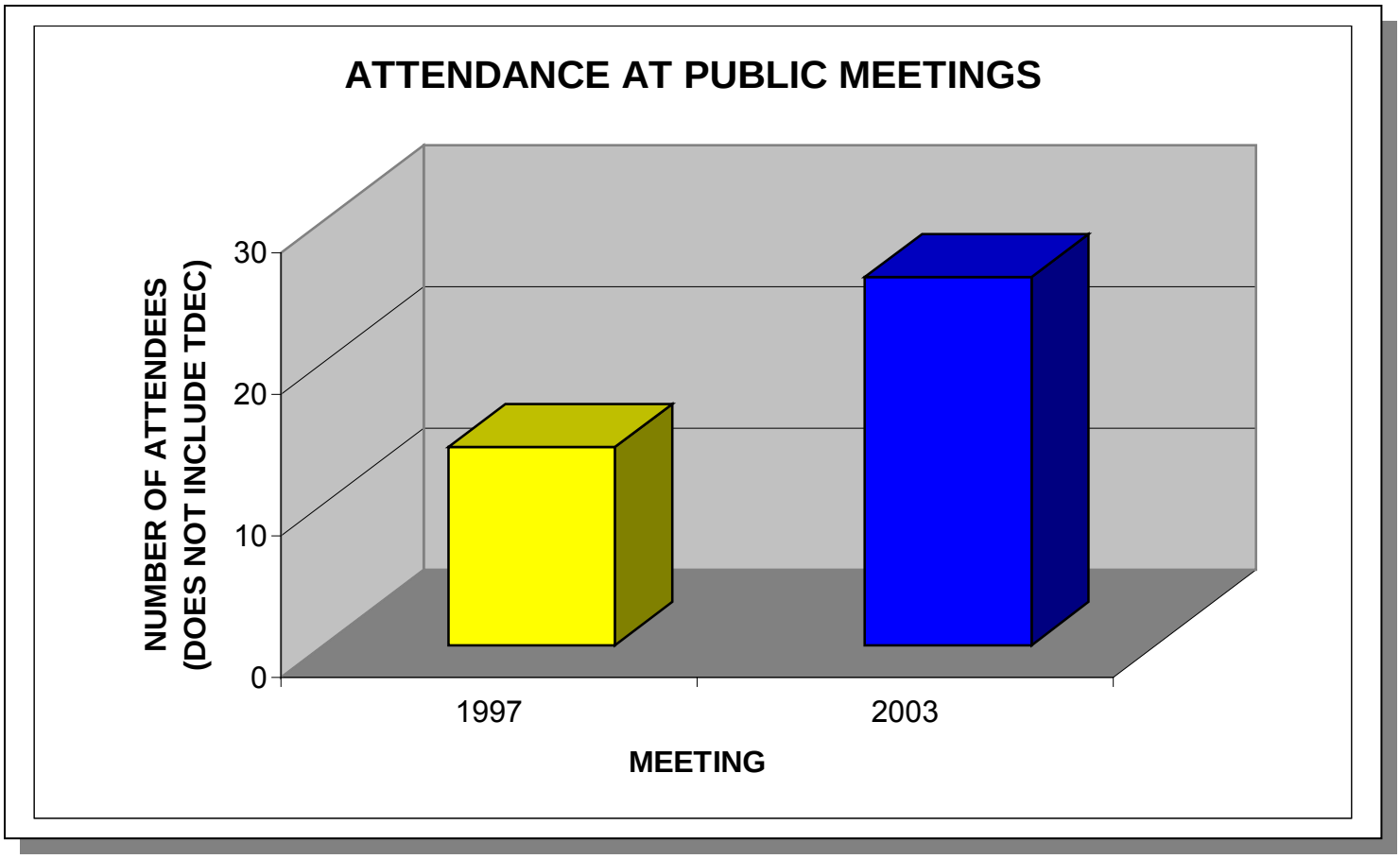


Figure 6-1. Attendance at Public Meetings in the Loosahatchie River Watershed.

Figure 6-2. In addition to the educational displays, plenty of time is allowed for questions and answers.

Figure 6-3. Interactions with partners, like the City of Lakeland shown here, are an important part of the public meeting and the Watershed Approach.

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.php

Approved TMDL:

Loosahatchie River, Cypress Creek, and Big Creek TMDL. TMDL for fecal coliform in the Loosahatchie River Watershed approved November 13, 2001:
http://www.state.tn.us/environment/wpc/loosfec4.pdf

TMDLs are prioritized for development based on many factors.

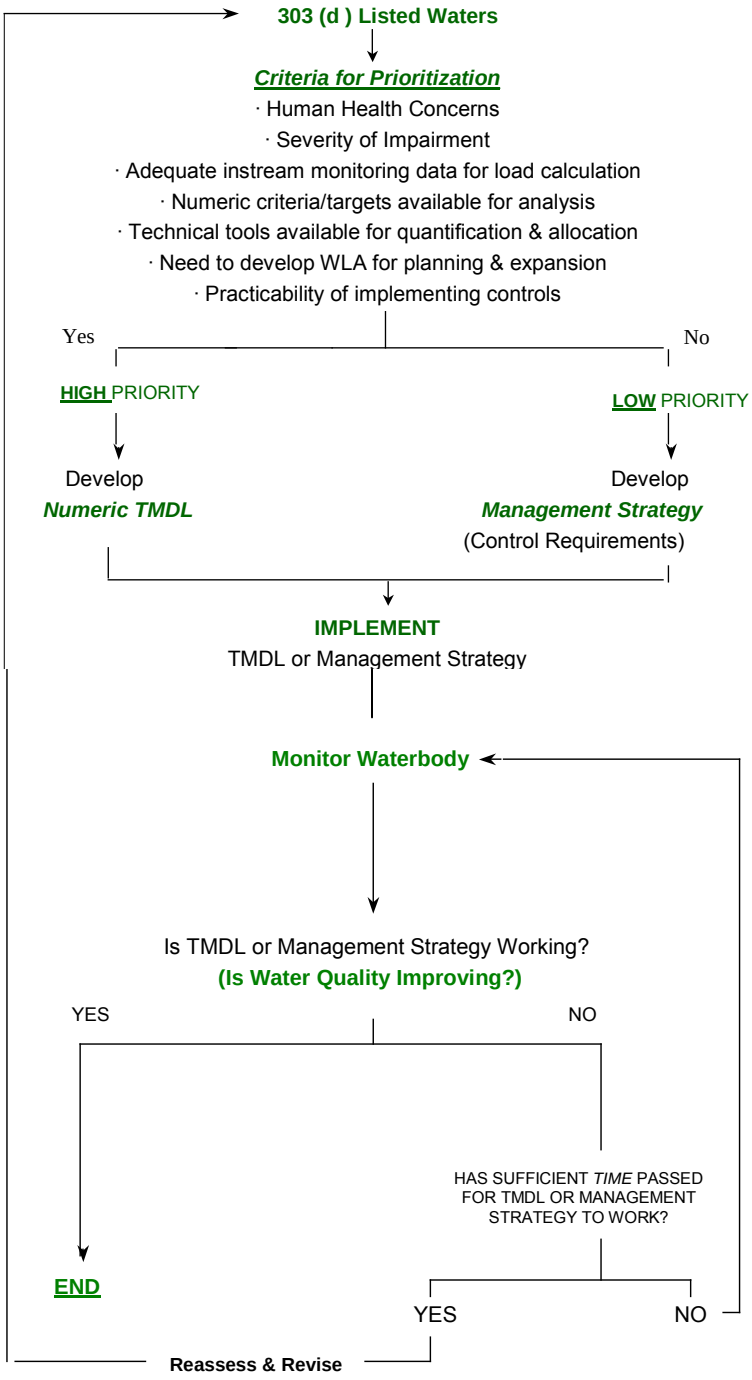


Figure 6-4. Prioritization scheme for TMDL Development.

6.3.B. Nonpoint Sources

Common nonpoint sources of pollution include urban runoff, riparian vegetation removal, and inappropriate land development, agricultural, and road construction practices. Since nonpoint pollution exists essentially everywhere rain falls and drains to a stream, existing point source regulations can have only a limited effect, so other measures are necessary.

There are several state and federal regulations that address some of the contaminants impacting waters in the Loosahatchie River watershed. Most of these are limited to only 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 voluntary efforts by landowners and volunteer groups, while others may involve new regulations. Many agencies, including the Tennessee Department of Agriculture and 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 certain types of impairments, causes, suggested improvement measures, and control strategies. The suggested measures and streams are only examples and efforts should not be limited to only those streams and measures mentioned.

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 are disturbed. In the spring of 2003, that threshold became 1 acre. The general permit issued for such construction sites sets out conditions for maintenance of the sites to minimize pollution from stormwater runoff, including requirements for installation and inspection of erosion controls. Also, the general permit imposes more stringent inspection and self-monitoring requirements on sites in the watershed of streams that are already impaired due to sedimentation. Examples in the Loosahatchie River Watershed are Big Creek and Beaver Creek. Regardless of the size, no construction site is allowed to cause a condition of pollution.

Construction sites within a sediment-impaired watershed may also have higher priority for inspections by WPC personnel, and are likely to have enforcement actions for failure to control erosion. The downstream portion of the Loosahatchie River is severely impaired by siltation. Construction activities in the watershed may, therefore, be monitored more closely.

6.3.B.i.b. From Channel and/or Bank Erosion. Since the Loosahatchie River was channelized many years ago and is in an area that has some crop production, erosion and riparian destruction is a significant source of stream impairment. Due to past channelization, the Loosahatchie River and many of its major tributaries (Big Creek, Beaver Creek, West Beaver Creek and others) have sections of unstable channels that are incising at a rapid rate. Several agencies are working to stabilize portions of stream banks. These include NRCS and University of Tennessee. Other methods or controls that might be necessary to address common problems are:

Strategies:

- Re-establishment of bank vegetation
- Better community planning for the impacts of development on small streams, especially development in growing areas (examples: Oliver Creek, Scotts Creek, Buckhead Creek, and Clear Creek Canal).
- Restrictions requiring post-construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion, (example: Oliver Creek).
- Prohibition on clearing of stream and ditch banks. *Note: Permits may be required for any work along streams.*
- Additional restriction to road and utilities crossings of streams.
- Restrictions on the use of off-highway vehicles on stream banks and in stream channels.

6.3.B.i.c. From Agriculture and Silviculture. Even though there is an exemption in the Water Quality Control Act which states that normal agricultural and silvicultural practices which do not result in a point source discharge do not have to obtain a permit, efforts are being made to address impacts due to these practices.

The agriculture community has strived to protect the soil from wind and soil erosion. Agencies such as the Natural Resources Conservation Service (NRCS), the University of Tennessee Agricultural Extension Service, and the Tennessee department of Agriculture have worked 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. A study of the Beaver Creek Watershed was conducted that addressed some of these issues. The U.S. Geological Survey Open-File Report 95-156, *Collection of Short Papers on the Beaver Creek Watershed Study in West Tennessee, 1989-94*, compiled by W. Harry Doyle, Jr. and Eva G. Baker, may be helpful in this regard.

6.3.B.ii. Pathogen Contamination.

Possible sources of pathogens 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 in streams and storm drains due to pets, livestock and wildlife. 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. Septic tank and field lines are regulated by the Division

of Ground Water Protection within Memphis Environmental Assistance Center (in Fayette and Tipton Counties) and delegated county health departments (Shelby County). In addition to discharges to surface waters, businesses may employ either subsurface or surface disposal of wastewater. The Division of Water Pollution Control regulates surface disposal.

Other measures that may be necessary to control pathogens are:

Voluntary activities

- Off-channel watering of livestock.
- Limiting livestock access to streams.
- Proper management of animal waste from feeding operations.

Enforcement strategies

- Greater enforcement of regulations governing on-site wastewater treatment.
- Timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.
- Identification of Concentrated Animal Feeding Operations not currently permitted, and enforcement of current regulations.

Additional strategies

- Restrict development 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. The city of Memphis already has a program in place as part of their MS4 implementation plan.
- Greater efforts by sewer utilities to identify leaking lines or overflowing manholes.

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 and from fertilized lawns and croplands.

Other 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 (examples of streams that could benefit are mainstem Loosahatchie River and West Beaver Creek). Streamside vegetation can filter out many nutrients and other pollutants before they reach the stream. These riparian buffers are also vital along livestock pastures.
- 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.

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.
- Discourage impoundments. Ponds and lakes do not aerate water. *Note: Permits may be required for any work on a stream, including impoundments.*

6.3.B.iv. Toxins and Other Materials.

Many materials enter our streams due to apathy, or lack of civility or knowledge by the public. Litter in roadside ditches, garbage bags tossed over bridge railings, paint brushes washed off over storm drains, and oil drained into ditches are all examples of pollution in streams. Some can be addressed by:

Voluntary activities

- Providing public education.
- Painting warnings on storm drains that connect to a stream.
- Sponsoring community clean-up days.
- Landscaping of public areas.
- Encouraging public surveillance of their streams and reporting of dumping activities to their local authorities.

Needing regulation

- Prohibition of illicit discharges to storm drains.
- Litter laws and strong enforcement at the local level.

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.
Measures that can help address this problem are:

Voluntary activities

- Sponsoring litter pickup days to remove litter that might enter streams.
- Organizing stream cleanups removing trash, limbs and debris before they cause blockage.

- Avoiding use of heavy equipment to “clean out” streams.
- Planting vegetation along streams to stabilize banks and provide habitat.
- Encouraging developers to avoid extensive culverts in streams.

Current regulations

- Restrict modification of streams by such means as culverting, lining, or impounding.
- Require mitigation for impacts to streams and wetlands when modifications are allowed.

Additional Enforcement

- Increased enforcement may be needed when violations of current regulations occur.

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 Loosahatchie River Watershed. Compliance information was obtained from EPA's Permit Compliance System (PCS). All data was queried for a five-year period between January 1, 2001 and December 31, 2006. 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 Loosahatchie River*.

6.4.A. Municipal Permits

TN0021351 Arlington Lagoon #1

Discharger rating: Major
City: Arlington
County: Shelby
EFO Name: Memphis
Issuance Date: 7/31/02
Expiration Date: 7/31/07
Receiving Stream(s): Loosahatchie River at mile 30.7
HUC-12: 080102090204
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon system

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
BOD % removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	% Removal
BOD5	All Year	208	lb/day	MAvg Load	Weekly	Grab	Effluent
BOD5	All Year	35	mg/L	WAvg Conc	Weekly	Grab	Effluent
BOD5	All Year	38.5	mg/L	DMax Conc	Weekly	Grab	Effluent
BOD5	All Year	321	lb/day	DMax Load	Weekly	Grab	Effluent
BOD5	All Year	25	mg/L	MAvg Conc	Weekly	Grab	Effluent
BOD5	All Year		mg/L	MAvg Conc	Weekly	Composite	Influent (Raw Sewage)
BOD5	All Year	292	lb/day	DMax Load	Weekly	Grab	Effluent
BOD5	All Year		mg/L	DMax Conc	Weekly	Composite	Influent (Raw Sewage)
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
D.O.	All Year	2	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	2.2	Percent	DMin Conc	Continuous	Composite	Influent (Raw Sewage)
IC25 7day Fathead Minnows	All Year	2.2	Percent	DMin Conc	Continuous	Composite	Influent (Raw Sewage)
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
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.9	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	97	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	809	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	725	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	87	mg/L	MAvg Conc	Weekly	Grab	Effluent

Table 6-1a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TSS	All Year	621	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	74.5	mg/L	WAvg Conc	Weekly	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 6-1b.

Tables 6-1a and b. Permit Limits for Arlington Lagoon.

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

- 30 BOD
- 18 TSS
- 10 Fecal coliform
- 3 Escherichia coli.
- 2 Overflows
- 2 bypasses.

EFO Comments:
This lagoon will be taken offline and replaced by the new Arlington STP. In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0078603 Arlington STP

Discharger rating: Major
City: Arlington
County: Shelby
EFO Name: Memphis
Issuance Date: 8/31/05
Expiration Date: 7/31/07
Receiving Stream(s): Loosahatchie River at mile 29.2
HUC-12: 080102090204
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: New Sequencing Batch Reactor treatment facility with ultraviolet disinfecting to replace existing treatment lagoon

Segment	TN08010209004_1000
Name	Loosahatchie River
Size	10
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Physical substrate habitat alterations
Sources	Channelization

Table 6-2. Stream Segment Information for Arlington STP.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	7.5	mg/L	WAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	All Year	156	lb/day	WAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	All Year	104	lb/day	MAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	All Year	208	lb/day	DMax Load	Weekdays	Composite	Effluent
BOD % removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	% Removal
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	Weekdays	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	All Year		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	All Year	40	mg/L	DMax Conc	Weekdays	Composite	Effluent
CBOD5	All Year	521	lb/day	MAvg Load	Weekdays	Composite	Effluent
CBOD5	All Year	35	mg/L	WAvg Conc	Weekdays	Composite	Effluent

Table 6-3a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
CBOD5	All Year	730	lb/day	WAvg Load	Weekdays	Composite	Effluent
D.O.	All Year	5	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Weekdays	Grab	Effluent
Escherichia coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	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	DMax Load	Daily	Continuous	Influent (Raw Sewage)
IC25 7day Ceriodaphnia Dubia	All Year	5.4	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	5.4	Percent	DMin Conc	Quarterly	Composite	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	625	lb/day	MAvg Load	Weekdays	Composite	Effluent
TSS	All Year	834	lb/day	WAvg Load	Weekdays	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	Weekdays	Composite	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekdays	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	Weekdays	Composite	Intake
TSS	All Year		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent

Table 6-3b.

Tables 6-3a- b. Permit Limits for Arlington STP.

Compliance History:
This facility will be operational in 2007.

EFO EFO Comments:
Arlington - the new plant will be operational in the spring of 2007. The existing lagoon will be phased out and closed.

In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0066800 Bartlett STP No. 1

Discharger rating: Major
City: Bartlett
County: Shelby
EFO Name: Memphis
Issuance Date: 1/31/02
Expiration Date: 1/31/07
Receiving Stream(s): Loosahatchie River Mile 18.4
HUC-12: 080102090204
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon system

Segment	TN08010209004_0100
Name	Black Ankle Creek
Size	27
Unit	Miles
First Year on 303(d) List	1990
Designated Uses	Livestock Watering and Wildlife (Supporting), Fish and Aquatic Life (Non-Supporting), Recreation (Supporting), Irrigation (Supporting)
Causes	Phosphate, Oxygen, Dissolved
Sources	Non-irrigated Crop Production

Table 6-4. Stream Segment Information for Bartlett STP No. 1.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	183	lb/day	DMax Load	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	10	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	92	lb/day	MAvg Load	3/Week	Composite	Effluent
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	All Year	30	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	459	lb/day	DMax Load	3/Week	Composite	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	367	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	20	mg/L	DMin Conc	3/Week	Composite	Effluent
D.O.	All Year	3	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	5.9	Percent	DMin Conc	Quarterly	Composite	Effluent

Table 6-5a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
IC25 7day Fathead Minnows	All Year	5.9	Percent	DMin Conc	Quarterly	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	734	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	550	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	WAvg Conc	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	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-5b.

Tables 6-5a -b. Permit Limits for Bartlett STP No. 1.

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

- 1 Ammonia
- 1 Settleable Solids
- 2 TSS
- 3 Fecal coliform
- 1 overflow

EFO EFO Comments:
Both Bartlett facilities will stay in use. Bartlett #2 will be upgraded, but not in the near future. Bartlett #1 will stay and they have room at the site to add more oxidation cells when needed for future expansion.

In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0068543 Bartlett STP #2

Discharger rating: Minor
City: Bartlett
County: Shelby
EFO Name: Memphis
Issuance Date: 12/31/02
Expiration Date: 3/31/07
Receiving Stream(s): Loosahatchie River at mile 24
HUC-12: 080102090204
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Complete mix aerated lagoon followed by disinfection

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
CBOD % Removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	% Removal
CBOD5	All Year	60	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	209	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	All Year	209	lb/day	DMax Load	Weekly	Composite	Effluent
CBOD5	All Year	167	lb/day	MAvg Load	Weekly	Grab	Effluent
CBOD5	All Year	50	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	40	mg/L	DMin Conc	Weekly	Grab	Effluent
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekly	Grab	Effluent
TRC	All Year	1.4	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	120	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	459	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	100	mg/L	WAvg Conc	Weekly	Grab	Effluent
TSS	All Year	417	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	110	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 6-6. Permit Limits for Bartlet STP No. 2.

Compliance History:

The following numbers of exceedences were noted in PCS:

- 8 Fecal coliform
- 5 Escherichia coli

EFO Comments:

Both Bartlett facilities will stay in use. Bartlett #2 will be upgraded, but not in the near future. Bartlett #1 will stay and they have room at the site to add more oxidation cells when needed for future expansion. In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River.

This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0056863 Camellia Homes Inc

Discharger rating: Minor
City: Atoka
County: Tipton
EFO Name: Memphis
Issuance Date: 6/28/02
Expiration Date: 6/30/07
Receiving Stream(s): Unnamed tributary at mile 0.7 to Big Creek at mile 22.1
HUC-12: 080102090401
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Complete mix aerated lagoon followed by disinfection

Segment	TN08010209021_3000
Name	Big Creek
Size	35.1
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Livestock Watering and Wildlife (Not Assessed), Fish and Aquatic Life (Not Assessed), Recreation (Not Assessed), Irrigation (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-7. Stream Segment Information for Camellia Homes.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	1.7	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	0.85	mg/L	MAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	3.5	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	1.75	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
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
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	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	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 Camellia Homes.

EFO Comments:
Small aerated lagoon. Has tight limits, no expansion projected.

TN0023833 E.E. Jeter School

Discharger rating: Minor
City: Millington
County: Shelby
EFO Name: Memphis
Issuance Date: 4/30/02
Expiration Date: 4/30/07
Receiving Stream(s): Unnamed tributary at mile 4.3 to Big Creek at mile 2.8
HUC-12: 080102090403
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Extended aeration

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
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
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	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-9. Permit Limits for E.E. Jeter School.

EFO Comments:

Small package plant. No expansion projected.

TN0062138 Gallaway STP

Discharger rating: Minor
City: Millington
County: Fayette
EFO Name: Memphis
Issuance Date: 4/30/02
Expiration Date: 4/30/07
Receiving Stream(s): Loosahatchie River mile 34.7
HUC-12: 080102090201
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Lagoon system.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
BOD % removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	% Removal
BOD5	All Year	70	mg/L	DMax Conc	Weekly	Grab	Effluent
BOD5	All Year	89	lb/day	DMax Load	Weekly	Grab	Effluent
BOD5	All Year	45	mg/L	MAvg Conc	Weekly	Grab	Effluent
BOD5	All Year	65	mg/L	WAvg Conc	Weekly	Grab	Effluent
BOD5	All Year	62	lb/day	MAvg Load	Weekly	Grab	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	1	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	120	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	138	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	165	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	100	mg/L	WAvg Conc	Weekly	Grab	Effluent
TSS	All Year	110	mg/L	MAvg Conc	Weekly	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 Gallaway STP.

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

- 1 TSS
- 42 BOD
- 3 pH
- 46 TSS
- 1 Fecal coliform
- 8 Escherichia coli.

EFO Comments:

No expansion projected in the near future. In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Gallaway, Somerville, Lakeland, and Bartlett.

TN0074012 Lakeland Lagoon

Discharger rating: Minor
City: Lakeland
County: Shelby
EFO Name: Memphis
Issuance Date: 4/30/02
Expiration Date: 4/30/07
Receiving Stream(s): Loosahatchie River mile 24.1
HUC-12: 080102090204
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Lagoon system

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	104	lb/day	DMax Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	20	mg/L	DMax Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	83	lb/day	DMax Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	10	mg/L	WAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	63	lb/day	DMax Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	42	lb/day	MAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	15	mg/L	MAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	30	mg/L	DMax Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	125	lb/day	DMax Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	20	mg/L	WAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	25	mg/L	MAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	83	lb/day	MAvg Load	Weekly	Composite	Effluent
CBOD % Removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	% Removal
CBOD5	Summer	60	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	Summer	250	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	Summer	208	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	Summer	40	mg/L	DMin Conc	Weekly	Grab	Effluent
CBOD5	Summer	167	lb/day	MAvg Load	Weekly	Grab	Effluent
CBOD5	Summer	50	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	Winter	45	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	Winter	30	mg/L	DMin Conc	Weekly	Grab	Effluent
CBOD5	Winter	40	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	Winter	167	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	Winter	188	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	Winter	125	lb/day	MAvg Load	Weekly	Grab	Effluent
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Composite	Effluent
TRC	All Year	1.4	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	120	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	500	lb/day	DMax Load	Weekly	Grab	Effluent

Table 6-11a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TSS	All Year	459	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	110	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS	All Year	417	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	100	mg/L	WAvg 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 6-11b.

Table 6-11a-b. Permit Limits for Lakeland Lagoon.

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

- 38 Ammonia
- 6 Chlorine
- 2 CBOD
- 4 Fecal coliform
- 4 Escherichia coli
- 8 overflows

Enforcement:
Agreed Order #02-0090 - City of Lakeland
Database notes: Assessed penalty and compliance schedule based on self-reported NPDES exceedances.

EFO Comments:
Lakeland is building their new Sequence Batch Reactor STP and it should be operational the fall of 2007. The lagoon will be used for sludge digestion.

In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0078255 Lakeland STP

Discharger rating: Major
City: Lakeland
County: Shelby
EFO Name: Memphis
Issuance Date: 5/31/06
Expiration Date: 7/31/07
Receiving Stream(s): Loosahatchie River mile 24.1
HUC-12: 080102090204
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Lagoon system.

Segment	TN08010209002_2000
Name	Loosahatchie River
Size	8.2
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	Physical substrate habitat alterations, Sedimentation/Siltation, Escherichia coli
Sources	Channelization, Site Clearance (Land Development or Redevelopment), Grazing in Riparian or Shoreline Zones

Table 6-12. Stream Segment Information for Lakeland STP.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	7.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	188	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	281	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD5	All Year	25	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	938	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	40	Percent	DMin % Removal	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	1314	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	40	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year	35	mg/L	WAvg Conc	3/Week	Composite	Effluent
D.O.	All Year	5	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Escherichia coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent

Table 6-13a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
IC25 7day Ceriodaphnia Dubia	All Year	10.8	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	10.8	Percent	DMin Conc	Quarterly	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
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Grab	Effluent
TRC	All Year	0.2	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	1501	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	Percent	DMin % Removal	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	1126	lb/day	MAvg Load	3/Week	Composite	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent

Table 6-13b.

Tables 6-13a- b. Permit Limits for Lakeland STP.

Compliance History:
New System to be operational Fall of 2007.

EFO Comments:
Lakeland is building their SBR and it should be operational the fall of 2007. The lagoon will be used for sludge digestion.

In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0065277 Mallard Ridge Mobile Estates

Discharger rating: Minor
City: Drummonds
County: Tipton
EFO Name: Memphis
Issuance Date: 3/28/02
Expiration Date: 3/31/07
Receiving Stream(s): Mile 0.4 of an unnamed tributary to North Fork Creek at mile 4.7
HUC-12: 080102090402
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Lagoon system

Segment	TN08010209021_0300
Name	North Fork Creek
Size	37.6
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Sedimentation/Siltation, Oxygen, Dissolved, Physical substrate habitat alterations
Sources	Non-irrigated Crop Production, Channelization

Table 6-14. Stream Segment Information for Mallard Ridge Mobile Estates.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	1.6	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Summer	0.8	mg/L	MAvg Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	3.5	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	1.75	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	Summer	17	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	Summer	8.5	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	Winter	24	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	Winter	12	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	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 6-15. Permit Limits for Mallard Ridge Mobile Estates.

EFO Comments:
Small lagoon, no discharge

TN0026620 Mason STP

Discharger rating: Minor
City: Mason
County: Tipton
EFO Name: Memphis
Issuance Date: 11/27/02
Expiration Date: 6/28/07
Receiving Stream(s): East Beaver Creek at mile 6.8
HUC-12: 080102090301
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Lagoon system

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	15	mg/L	MAvg Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	All Year	14	lb/day	MAvg Load	Monthly	Grab	Effluent
BOD % removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	% Removal
BOD5	All Year	55	mg/L	DMax Conc	Weekly	Grab	Effluent
BOD5	All Year	50	lb/day	DMax Load	Weekly	Grab	Effluent
BOD5	All Year	46	lb/day	DMax Load	Weekly	Grab	Effluent
BOD5	All Year	41	lb/day	MAvg Load	Weekly	Grab	Effluent
BOD5	All Year	50	mg/L	WAvg Conc	Weekly	Grab	Effluent
BOD5	All Year	45	mg/L	MAvg Conc	Weekly	Grab	Effluent
D.O.	All Year	1	mg/L	DMin Conc	1/Discharge	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekly	Grab	Effluent
TRC	All Year	0.13	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	115	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	92	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	105	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	101	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	100	mg/L	WAvg Conc	Weekly	Grab	Effluent
TSS	All Year	110	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 6-16. Permit Limits for Mason STP.

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

- 13 Ammonia
- 18 BOD
- 20 TSS
- 1 Fecal coliform
- 1 Escherichia coli.

EFO Comments:

In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0026361 Memphis-Chapel Hill S.D. STP

Discharger rating: Minor
City: Mason
County: Shelby
EFO Name: Memphis
Issuance Date: 6/28/02
Expiration Date: 6/30/07
Receiving Stream(s): Mile 0.2 of an unnamed sream to mile 2.1 of an unnamed tributary to Crooked Creek at mile 3.0
HUC-12: 080102090401
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Extended aeration

Segment	TN08010209021_0500
Name	Crooked Creek Canal
Size	31.21
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Oxygen, Dissolved, Physical substrate habitat alterations
Sources	Non-irrigated Crop Production, Channelization

Table 6-17. Stream Segment Information for Memphis-Chapel Hill S.D. STP.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	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
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
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	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-18. Permit Limits for Memphis-Chapel Hill S.D. STP.

EFO EFO Comments:
No projected growth. Small package plant will connect to Memphis within the next 5-10 years.

TN0021067 Millington STP #2

Discharger rating: Major
City: Millington
County: Shelby
EFO Name: Memphis
Issuance Date: 6/30/02
Expiration Date: 6/30/07
Receiving Stream(s): Big Creek
HUC-12: 080102090402
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Dual circular oxidation ditches with clarifiers to sand filters with chlorine contact and post aeration. Sludge is held in a lagoon until land applied by injection.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	1.7	mg/L	DMax Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	63	lb/day	DMax Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	1.3	mg/L	MAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	41	lb/day	MAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	0.85	mg/L	WAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	3.5	mg/L	DMax Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	1.75	mg/L	WAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	85	lb/day	MAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	2.6	mg/L	MAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	125	lb/day	DMax Load	Weekdays	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	Weekdays	Calculated	% Removal
CBOD5	All Year	20	mg/L	DMax Conc	Weekdays	Composite	Effluent
CBOD5	All Year	10	mg/L	DMin Conc	Weekdays	Composite	Effluent
CBOD5	All Year	15	mg/L	MAvg Conc	Weekdays	Composite	Effluent
CBOD5	All Year	726	lb/day	DMax Load	Weekdays	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	All Year		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
CBOD5	All Year	484	lb/day	MAvg Load	Weekdays	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Weekdays	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekdays	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekdays	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

Table 6-19a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
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
Nitrogen Total (as N)	Summer		mg/L	MAvg 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
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Composite	Effluent
TRC	All Year	0.026	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekdays	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	All Year	1935	lb/day	DMax Load	Weekdays	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	Weekdays	Composite	Effluent
TSS	All Year	1451	lb/day	MAvg Load	Weekdays	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	WAvg Conc	Weekdays	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	Weekdays	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 6-19b.

Tables 6-19a-b. Permit Limits for Millington STP #2.

Compliance History:

- 1 overflow
- 1 bypass

EFO Comments:

According to their last inspection report that Eddy Bouzeid did in 2005, the facility was in very good shape, well maintained, equipment calibrated. No expansion projected.

TN0023795 Northwest School

Discharger rating: Minor
City: Mason
County: Fayette
EFO Name: Memphis
Issuance Date: 6/30/06
Expiration Date: 4/30/07
Receiving Stream(s): Unnamed tributary at mile 1.8, which enters Beaver Creek at mile 3.6
HUC-12: 080102090301
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	2/Week	Grab	Effluent
Escherichia coli	All Year	941	#/100mL	DMax Conc	Monthly	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Flow	All Year		MGD	MAvg Load	2/Week	Instantaneous	Effluent
Flow	All Year		MGD	DMax Load	2/Week	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	2/Week	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	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-20. Permit Limits for Northwest School.

EFO Comments:
Small facultative lagoon. Permit modified to align pathogen-monitoring requirements with current water quality standards. No expansion projected.

TN0077836 Oakland - Mechanical WWTP

Discharger rating: Major
City: Oakland
County: Fayette
EFO Name: Memphis
Issuance Date: 11/30/04
Expiration Date: 11/29/07
Receiving Stream(s): Loosahatchie River at mile 40.5
HUC-12: 080102090201
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Treatment of municipal sewage via the sequencing batch reactor activated sludge process

Segment	TN08010209007_1000
Name	Loosahatchie River
Size	9.6
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Physical substrate habitat alterations
Sources	Channelization

Table 6-21. Stream Segment Information for Oakland WWTP.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Winter	4	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	3	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	50	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	75	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD % Removal	All Year	40	Percent	MAvg % Removal	3/Week	Calculated	Effluent
CBOD5	All Year	85	Percent	MAvg Min	Monthly	Composite	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	375	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	15	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	250	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
Copper Total Recoverable	All Year	0.048	mg/L	DMax Conc	Weekly	Composite	Effluent
Copper Total Recoverable	All Year	0.863	lb/day	MAvg Load	Weekly	Composite	Effluent

Table 6-22a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Copper Total Recoverable	All Year	0.034	mg/L	MAvg Conc	Weekly	Composite	Effluent
Copper Total Recoverable	All Year	1.189	lb/day	DMax Load	Weekly	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekly	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Weekly	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Weekly	Continuous	Influent (Raw Sewage)
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	MAvg Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	MAvg Conc	Quarterly	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Grab	Effluent
TRC	All Year	0.08	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	750	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	1000	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS % Removal	All Year	85	Percent	MAvg Min	Monthly	Calculated	Percent Removal
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	Percent Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-22b.

Tables 6-22a-b. Permit Limits for Oakland WWTP.

Compliance History:
New system went into effect January 1, 2007.

EFO Comments:
New system went into effect January 1, 2007.

In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0026573 Oakland - Lagoon

Discharger rating: Minor
City: Oakland
County: Fayette
EFO Name: Memphis
Issuance Date: 11/27/02
Expiration Date: 11/26/07
Receiving Stream(s): Unnamed tributary at mile 1.2 to Cypress Creek Canal at mile 10.1 to Loosahatchie River
HUC-12: 080102090205
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon system

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	2	mg/L	DMax Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	4	mg/L	DMax Conc	Weekly	Grab	
Ammonia as N (Total)	All Year	5	lb/day	DMax Load	Weekly	Grab	
Ammonia as N (Total)	All Year	2.5	lb/day	DMax Load	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	2	mg/L	WAvg Conc	Weekly	Grab	
Ammonia as N (Total)	All Year	3	mg/L	MAvg Conc	Weekly	Grab	
Ammonia as N (Total)	All Year	2.5	lb/day	MAvg Load	Weekly	Grab	
Ammonia as N (Total)	All Year	1.3	lb/day	MAvg Load	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	1.5	mg/L	MAvg Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	1	mg/L	WAvg Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	Summer	1.9	lb/day	DMax Load	Weekly	Grab	Effluent
Ammonia as N (Total)	Winter	3.8	lb/day	DMax Load	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	% Removal
CBOD5	All Year	20	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	12.6	lb/day	MAvg Load	Weekly	Grab	Effluent
CBOD5	All Year	15	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	25	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	All Year	10	mg/L	DMin Conc	Weekly	Grab	Effluent
CBOD5	All Year	19	lb/day	DMax Load	Weekly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekly	Grab	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
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

Table 6-23a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TSS	All Year	45	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	57	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	50	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	40	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS	All Year	38	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	30	mg/L	WAvg Conc	Weekly	Grab	Effluent
TSS % Removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	% Removal
pH	All Year	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Tables 6-23b.

Tables 6-23a-b. Permit Limits for Oakland Lagoon.

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

- 16 Dissolved Oxygen
- 93 Ammonia
- 43 TSS
- 3 Fecal coliform
- 1 Escherichia coli
- 1 pH
- 1 Settleable Solids
- 8 overflows

EFO Comments:
The City of Oakland will continue to use the Lagoon for sludge digestion. A minor modification to the permit has been granted per a request letter dated 1/18/06, for changing disinfection method from chlorination to UV system.

In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Somerville, Gallaway, Lakeland, and Bartlett.

TN0056871 Pine Grove Mobile Home Park

Discharger rating: Minor
City: Atoka
County: Tipton
EFO Name: Memphis
Issuance Date: 7/31/02
Expiration Date: 4/30/07
Receiving Stream(s): Unnamed tributary at mile 5.0 to North Fork Creek at mile 2.8
HUC-12: 080102090402
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon

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
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
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	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-24. Permit Limits for Pine Grove Mobile Home Park.

EFO Comments:
Small facultative lagoon. No discharge.

TN0061433 Pine Lake Cooperative

Discharger rating: Minor
City: Atoka
County: Fayette
EFO Name: Memphis
Issuance Date: 8/29/02
Expiration Date: 8/30/07
Receiving Stream(s): Unnamed tributary at mile 5.0 to North Fork Creek at mile 2.8
HUC-12: 080102090205
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon

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
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
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	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-25. Permit Limits for Pine Lake Cooperative.

EFO Comments:
Aerated lagoon. No plans for expansion.

TN0067482 Pleasant Ridge Trailer Park

Discharger rating: Minor
City: Millington
County: Shelby
EFO Name: Memphis
Issuance Date: 11/27/02
Expiration Date: 11/30/07
Receiving Stream(s): Loosahatchie River at mile 20.9
HUC-12: 080102090206
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	0.9	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	1.5	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	Summer	7.5	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	Winter	12.75	mg/L	DMax Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Month	Grab	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	2/Month	Grab	Effluent
pH	All Year	8.5	SU	DMax Conc	2/Month	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Month	Grab	Effluent

Table 6-26. Permit Limits for Pleasant Ridge Trailer Park.

EFO Comments:
None

TN0021652 Somerville Lagoon

Discharger rating: Minor
City: Somerville
County: Fayette
EFO Name: Memphis
Issuance Date: 6/30/02
Expiration Date: 9/30/07
Receiving Stream(s): Loosahatchie River at mile 46.7
HUC-12: 080102090103
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Lagoon followed by overland flow treatment

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	16	mg/L	DMax Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	Summer	119	lb/day	DMax Load	Weekly	Grab	Effluent
Ammonia as N (Total)	Summer	8	mg/L	MAvg Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	Summer	12	mg/L	WAvg Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	Summer	60	lb/day	MAvg Load	Weekly	Grab	Effluent
Ammonia as N (Total)	Summer	90	lb/day	WAvg Load	Weekly	Grab	Effluent
Ammonia as N (Total)	Winter		mg/L	DMax Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	Winter		mg/L	MAvg 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	40	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	261	lb/day	WAvg Load	Weekly	Grab	Effluent
CBOD5	All Year	35	mg/L	WAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	187	lb/day	MAvg Load	Weekly	Grab	Effluent
CBOD5	All Year		mg/L	MAvg Conc	Weekly	Grab	Influent (Raw Sewage)
CBOD5	All Year	299	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	All Year		mg/L	DMax Conc	Weekly	Grab	Influent (Raw Sewage)
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	941	#/100mL	DMax Conc	Weekly	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	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)
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
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent

Table 6-27a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TRC	All Year	0.24	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	120	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	896	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	821	lb/day	WAvg Load	Weekly	Grab	Effluent
TSS	All Year	100	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS	All Year	746	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	110	mg/L	WAvg Conc	Weekly	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 6-27b.

Tables 6-27a and b. Permit Limits for Somerville Lagoon.

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

- 18 CBOD
- 9 Chlorine
- 1 Dissolved Oxygen
- 24 Ammonia
- 7 TSS
- 1 Fecal coliform
- 3 pH
- 1 Settleable Solids
- 13 Overflows
- 11 bypasses

EFO Comments:
In February 2005, the Civil Engineering Department at the University of Memphis produced a report on the Water Quality of the Loosahatchie River. This report included 25-year growth projections for the major wastewater treatment plants along the Loosahatchie River including Arlington, Mason, Oakland, Gallaway, Lakeland, Somerville and Bartlett.

TN0074799 Pilot Travel Centers LLC #149

Discharger rating: Minor
City: Stanton
County: Fayette
EFO Name: Memphis
Issuance Date: 9/30/05
Expiration Date: 3/30/08
Receiving Stream(s): Unnamed tributary of Muddy Creek at mile 5.0
HUC-12: 080102090203
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Septic tanks, collection system, new lotous submerged - film activated sludge discharge into facultative lagoon

Segment	TN08010208007_0999
Name	Misc Tribs to Big Muddy Creek
Size	104.6
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Irrigation (Not Assessed), Livestock Watering and Wildlife (Not Assessed), Recreation (Not Assessed), Fish and Aquatic Life (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-28. Stream Segment Information for Pilot Travel Centers.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	2	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Summer	1	mg/L	MAvg Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	4	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	2	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	All Year	10	mg/L	DMin Conc	Monthly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
Escherichia coli	All Year	941	#/100mL	DMax Conc	Monthly	Grab	Effluent
Escherichia coli	All Year	126	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Settleable Solids	Summer	1	mL/L	MAvg 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	WAvg Conc	Monthly	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 6-29. Permit Limits for Pilot Travel Centers.

Compliance History:
No numbers of exceedences noted in PCS.

EFO Comments:

Retail travel center, Package plant.

6.4.B. Industrial Permits

TN0000965 Air Liquide Industrial U.S. LP

Discharger rating: Minor
City: Millington
County: Shelby
EFO Name: Memphis
Issuance Date: 5/31/02
Expiration Date: 2/26/07
Receiving Stream(s): Mile 1.9 of a wet weather conveyance to mile 11.7 of the Loosahatchie River
HUC-12: 080102090206
Effluent Summary: Non-contact cooling water from Outfall 001
Treatment system: -

Segment	TN08010209002_1000
Name	Loosahatchie River
Size	10.3
Unit	Miles
First Year on 303(d) List	1990
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Sedimentation/Siltation, Polychlorinated biphenyls, Escherichia coli, Chlordane, Physical substrate habitat alterations, Dioxin (including 2,3,7,8-TCDD)
Sources	Channelization, Site Clearance (Land Development or Redevelopment), Contaminated Sediments, Discharges from Municipal Separate Storm Sewer Systems (MS4)

Table 6-30. Stream Segment Information for Air Liquide Industrial.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Flow	All Year		MGD	DMax Load	Continuous	Recorder	Effluent
Flow	All Year		MGD	MAvg Load	Continuous	Recorder	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Temperature (°C)	All Year		°C	DMax Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Month	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Month	Grab	Effluent

Table 6-31. Permit Limits for Air Liquide Industrial.

Compliance History:
No numbers of exceedences noted.

EFO Comments:
Carbon Dioxide liquid is depressurized to form dry ice or solid carbon dioxide.

TN0001091 E. I. DuPont De Nemours & Co., Inc. - Memphis

Discharger rating: Major
City: Millington
County: Shelby
EFO Name: Memphis
Issuance Date: 9/12/03
Expiration Date: 12/31/07
Receiving Stream(s): Loosahatchie River at mile 11.8 (all Outfalls)
HUC-12: 080102090206
Effluent Summary: Treated process wastewater and nonprocess wastewater from Outfall 001, and storm water from Outfalls SW1, and SW3-S15
Treatment system: -

Segment	TN08010209002_1000
Name	Loosahatchie River
Size	10.3
Unit	Miles
First Year on 303(d) List	1990
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Sedimentation/Siltation, Polychlorinated biphenyls, Escherichia coli, Chlordane, Physical substrate habitat alterations, Dioxin (including 2,3,7,8-TCDD)
Sources	Channelization, Site Clearance (Land Development or Redevelopment), Contaminated Sediments, Discharges from Municipal Separate Storm Sewer Systems (MS4)

Table 6-32. Stream Segment Information for DuPont De Nemours & Co., Inc.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
BOD5	All Year	1000	lb/day	DMax Load	Weekly	Composite	Effluent
BOD5	All Year	500	lb/day	MAvg Load	Weekly	Composite	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	15	Percent	DMin Conc	Monthly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	15	Percent	DMin Conc	Monthly	Composite	Effluent
Oil and Grease (Freon EM)	All Year	30	mg/L	DMax Conc	Quarterly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	MAvg Conc	Quarterly	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekly	Composite	Effluent
TSS	All Year	2275	lb/day	DMax Load	Weekly	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Weekly	Composite	Effluent
pH	All Year	9	SU	DMax Conc	Daily	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Daily	Grab	Effluent

Table 6-33. Permit Limits for DuPont De Nemours & Co., Inc.

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

- 4 Cyanide
- 7 TSS.

EFO Comments: Manufacturer of various inorganic chemicals, organic chemicals, and acrylic sheeting.

TN0000141 PCS Nitrogen Fertilizer, L.P.

Discharger rating: Minor
City: Millington
County: Shelby
EFO Name: Memphis
Issuance Date: 6/30/05
Expiration Date: 6/30/07
Receiving Stream(s): Wet weather conveyance at facility to unnamed tributary to Loosahatchie River at mile 11.7
HUC-12: 080102090206
Effluent Summary: Treated process wastewater and nonprocess wastewater from Outfall 001, and storm water from Outfalls SW1, and SW3-S15
Treatment system: -

Segment	TN08010209002_1000
Name	Loosahatchie River
Size	10.3
Unit	Miles
First Year on 303(d) List	1990
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Sedimentation/Siltation, Polychlorinated biphenyls, Escherichia coli, Chlordane, Physical substrate habitat alterations, Dioxin (including 2,3,7,8-TCDD)
Sources	Channelization, Site Clearance (Land Development or Redevelopment), Contaminated Sediments, Discharges from Municipal Separate Storm Sewer Systems (MS4)

Table 6-34. Stream Segment Information for PCS Nitrogen Fertilizer, L.P.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	1.8	mg/L	DMax Conc	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	1.8	mg/L	DMax Conc	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	1.8	mg/L	DMax Conc	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	1.8	mg/L	DMax Conc	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	1.1	lb/day	DMax Load	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	2.6	lb/day	DMax Load	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	0.9	mg/L	MAvg Conc	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	0.9	mg/L	MAvg Conc	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	0.56	lb/day	MAvg Load	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	2.63	lb/day	MAvg Load	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	1.31	lb/day	MAvg Load	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	0.94	lb/day	MAvg Load	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	0.9	mg/L	MAvg Conc	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	0.9	mg/L	MAvg Conc	Daily	Composite	Effluent

Table 6-35a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	5.25	lb/day	DMax Load	Daily	Composite	Effluent
Ammonia as N (Total)	All Year	1.9	lb/day	DMax Load	Daily	Composite	Effluent
CBOD5	All Year	265	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	All Year	28	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD5	All Year	57	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD5	All Year	80	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD5	All Year	114	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	All Year	47	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	All Year	159	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	All Year	133	mg/L	MAvg Conc	Weekly	Composite	Effluent
D.O.	All Year	5	mg/L	DMin Conc	Weekly	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Semi-annually	Grab	Effluent
Oil and Grease (Freon EM)	All Year	30	mg/L	DMax Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	13	mg/L	DMax Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	18	mg/L	DMax Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	24	mg/L	MAvg Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	MAvg Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	5	mg/L	MAvg Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	14	mg/L	MAvg Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	7	mg/L	DMax Conc	Weekly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Weekly	Grab	Effluent
TRC	All Year	0.011	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS	All Year	128	mg/L	DMax Conc	Weekly	Composite	Effluent
TSS	All Year	77	mg/L	DMax Conc	Weekly	Composite	Effluent
TSS	All Year	55	mg/L	DMax Conc	Weekly	Composite	Effluent
TSS	All Year	96	mg/L	MAvg Conc	Weekly	Composite	Effluent
TSS	All Year	41	mg/L	MAvg Conc	Weekly	Composite	Effluent
TSS	All Year	21	mg/L	MAvg Conc	Weekly	Composite	Effluent
TSS	All Year	58	mg/L	MAvg Conc	Weekly	Composite	Effluent
TSS	All Year	27	mg/L	DMax Conc	Weekly	Composite	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-35b.

Tables 6-35a-b. Permit Limits PCS Nitrogen Fertilizer, L.P.

Compliance History:

No numbers of exceedences noted.

EFO Comments:
Production of nitrogenous fertilizers

TN0078671 Pilot Travel Centers LLC #149

Discharger rating: Minor
City: Stanton
County: Fayette
EFO Name: Memphis
Issuance Date: 7/29/05
Expiration Date: 11/30/07
Receiving Stream(s): unnamed tributary to Little Cypress Creek
HUC-12: 080102090203
Effluent Summary: runoff wastewater from diesel islands from Outfall 001
Treatment system: oil and water separator

Segment	TN08010208032_1000
Name	Cypress Creek
Size	19.2
Unit	Miles
First Year on 303(d) List	2002
Designated Uses	Recreation (Not Assessed), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Sedimentation/Siltation, Oxygen, Dissolved
Sources	Non-irrigated Crop Production

Table 6-36. Stream Segment Information for Pilot Travel Centers LLC#149.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Benzene	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Monthly	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year		SU	DMin Conc	Monthly	Grab	Effluent
pH	All Year		SU	DMax Conc	Monthly	Grab	Effluent

Table 6-37. Permit Limits for Pilot Travel Centers LLC#149.

Compliance History:
No numbers of exceedences noted.

EFO Comments:
Retail travel center

6.4.B. Water Treatment Plant Permits

TN0078590 Memphis LG&W-LNG Pumping Station WTP

Discharger rating: Minor
City: Arlington
County: Shelby
EFO Name: Memphis
Issuance Date: 3/18/05
Expiration Date: 9/27/09
Receiving Stream(s): Unnamed tributary at mile 0.5 to Loosahatchie River at mile 26.4
HUC-12: 080102090302
Effluent Summary: -
Treatment system: Iron Removal WTP. 1.0 PPM each of chlorine, fluoride, and polyphosphate added to finished water.

Segment	TN08010209004_1000
Name	Loosahatchie River
Size	10
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Physical substrate habitat alterations
Sources	Channelization

Table 6-38. Stream Segment Information for Memphis LG&W-LNG Pumping Station WTP.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Fe (T)	All Year	2	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-39. Permit Limits for Memphis LG&W-LNG Pumping Station WTP.

EFO Comments:
Iron Removal WTP. No plans for expansion.

TN0058815 Poplar Grove Utility District WTP

Discharger rating: Minor
City: Atoka
County: Tipton
EFO Name: Memphis
Issuance Date: 9/27/04
Expiration Date: 9/28/09
Receiving Stream(s): Big Creek at mile 22.1
HUC-12: 080102090401
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Iron removal using hydrated lime, liquid polymer and chlorine

Segment	TN08010209021_3000
Name	Big Creek
Size	35.1
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Livestock Watering and Wildlife (Not Assessed), Fish and Aquatic Life (Not Assessed), Recreation (Not Assessed), Irrigation (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-40. Stream Segment Information for Poplar Grove Utility District WTP.

Parameter	*Season*	*Limit*	*Units*	*Sample Designator*	*Monitoring Frequency*	*Sample Type*	*Monitoring Location*
Al (T)	All Year	0.75	mg/L	DMax Conc	Monthly	Grab	Effluent
Fe (T)	All Year	2	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-41. Permit Limits for Poplar Grove Utility District WTP.

EFO Comments:
Iron removal WTP. No plans for expansion.

APPENDIX II

ID	NAME	HAZARD		ID	NAME	HAZARD
247003	Hall	3		797037	Paradise	S
247004	Salmon	S		797042	Whiteoak Subdivision Lake	2
247011	Fore Co Ranch Lake	3		797045	Tompkins Lake	2
247013	Glengary Lake	2		797046	Lyle	2
247016	Lake Clara Dam	3		797049	Chase #1	L
247018	Gresham	2		797050	Chase #2	L
247026	Price Pond #1	3		797058	Lakeland	1
247027	Wilder	S		797060	Casper	1
247029	Lake Tia Khata	2		797061	Chase (#3)	L
247033	Middlecoff	2		797063	Robertson	2
247038	Winfrey	3		797064	Fogelman	S
247041	Terra Alta Lake	3		797065	Camp Lake #1	1
797001	Beaver	1		657002	Johnson	3
797002	Otter	1		797070	Wray (Nat'ltrust Life)	L
797005	Mitchell #1	3		797072	Camp #2	1
797006	Mitchell #2	B		797074	Burbage	O
797007	Mitchell #3	L		797076	Lake #1	3
797009	Spring Lake	2		797098	Bfi Dam	3
797010	Gordon	3		847001	Hank's	3
797011	Camp Haiyaka Lake	L		847006	Reed #1	1
797012	Edwards	H		847007	Reed #2	2
797014	Rowe	S		847008	Meade Lake	3
47001	Pine Lake	3		657002	Johnson	3
797034	Williams	L		97014	Walker Pond	3
797032	Jake's Lake	L		847012	Ray's Lake	3
797033	Drewry	3		847015	Lake Ellen	2
797034	Williams	L				

Table A2-1. Inventoried Dams in the Loosahatchie Watershed. *Hazard Codes: F, Federal; (H, 1), High; (S, 2), Significant; (L, 3), Low; (B), Breached; O, Too Small. TDEC only regulates dams indicated by a numeric hazard score.*

LAND COVER/LAND USE	ACRES	% OF WATERSHED
Open Water	4,381	0.9
Other Grasses	1,196	0.3
Pasture/Hay	94,352	19.9
Row Crops	174,304	36.8
Woody Wetlands	26,384	5.6
Deciduous Forest	85,753	18.1
Mixed Forest	59,167	12.5
Evergreen Forest	8,235	1.7
High Intensity: Commercial/Industrial	1,866	0.4
High Intensity: Residential	4,409	0.9
Low Intensity: Residential	13,372	2.8
Quarries/Strip Mines/Gravel Pits	257	0.1
Transitional	389	0.1
Bare Rock/Sand/Clay	0	0.0
Total	**474,076**	**100.1**

Table A2-2. Land Use Distribution in Loosahatchie 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)
Southeastern Plains and Hills (65e)	Blunt Creek Griffin Creek Harris Creek Marshall Creek West Fork Spring Creek	TN Western Valley (KY Lake) North Fork Forked Deer South Fork Forked Deer Hatchie River Hatchie River	06040005 08010204 08010205 08010208 08010208
Northern Mississippi Alluvial Plain (73a)	Cold Creek Middle Fork Forked Deer River Cold Creek Bayou du Chien	Mississippi River Mississippi River Mississippi River Obion River	08010100 08010100 08010100 08010202
Bluff Hills (74a)	Sugar Creek Paw Paw Creek	Mississippi River Obion River	08010100 08010202
Loess Plains (74b)	Terrapin Creek Powell Creek Wolf River	Obion River Obion River Wolf River	08010202 08010202 08010210

Table A2-3. Ecoregion Monitoring Sites in Ecoregions 65e, 73a, 74a, and 74b.

.

CODE	NAME	AGENCY	AGENCY ID
319	TDOT SR 59 MITIGATION/PERMIT SITE	TDOT	
341	TDOT SR 15 MITIGATION/PERMIT SITE	TDOT	
356	TDOT SR 59 MITIGATION SITE	TDOT	
372	TDOT SR 57 MITIGATION SITE	TDOT	
400	TDOT US 64 PERMIT SITE	TDOT	
415	TDOT SR 59 PERMIT SITE	TDOT	
416	TDOT SR 59 PERMIT SITE	TDOT	
419	TDOT SR 59 PERMIT SITE	TDOT	
436	TDEC/WPC LOOSAHATCHIE RIVER TRIBUTARY PERMIT SITE	TDEC/WPC	
504	TDOT SR 59 PERMIT SITE	TDOT	
510	TDOT KING CREEK PERMIT SITE	TDOT	
511	TDOT KING CREEK MITIGATION SITE	TDOT	
827	USFWS MILLINGTON NAVAL AIR STATION #1	USFWS	MILLINGTON.1
828	USFWS MILLINGTON NAVAL AIR STATION #2	USFWS	MILLINGTON.2
829	USFWS MILLINGTON NAVAL AIR STATION #3	USFWS	MILLINGTON.3
830	USFWS MILLINGTON NAVAL AIR STATION #4	USFWS	MILLINGTON.4
831	USFWS MILLINGTON NAVAL AIR STATION #5	USFWS	MILLINGTON.5
832	USFWS MILLINGTON NAVAL AIR STATION #6	USFWS	MILLINGTON.6
833	USFWS MILLINGTON NAVAL AIR STATION #7	USFWS	MILLINGTON.7
834	USFWS MILLINGTON NAVAL AIR STATION #8	USFWS	MILLINGTON.8
835	USFWS MILLINGTON NAVAL AIR STATION #9	USFWS	MILLINGTON.9
836	USFWS MILLINGTON NAVAL AIR STATION #10	USFWS	MILLINGTON.10
837	USFWS MILLINGTON NAVAL AIR STATION #11	USFWS	MILLINGTON.11
838	USFWS MILLINGTON NAVAL AIR STATION #12	USFWS	MILLINGTON.12
839	USFWS MILLINGTON NAVAL AIR STATION #13	USFWS	MILLINGTON.13
840	USFWS MILLINGTON NAVAL AIR STATION #14	USFWS	MILLINGTON.14
841	USFWS MILLINGTON NAVAL AIR STATION #15	USFWS	MILLINGTON.15
842	USFWS MILLINGTON NAVAL AIR STATION #16	USFWS	MILLINGTON.16
843	USFWS MILLINGTON NAVAL AIR STATION #17	USFWS	MILLINGTON.17
844	USFWS MILLINGTON NAVAL AIR STATION #18	USFWS	MILLINGTON.18
845	USFWS MILLINGTON NAVAL AIR STATION #19	USFWS	MILLINGTON.19
884	USFWS HORNE BROTHERS FARMS WRP SITE	USFWS	TRACT 782 FRM 1968
903	USFWS HERBERT L. AND CLARA F. SCHOCKE WRP SITE	USFWS	
1260	USACOE-MEMPHIS BEAVER CREEK 95-000[TD] SITE	USACOE-M	
1261	USACOE-MEMPHIS BEAVER CREEK 95-003 [TD] SITE	USACOE-M	
1269	USACOE CYPRESS CREEK CANAL SITE	USACOE-M	
1284	USACOE HALL CREEK SITE	USACOE-M	
1306	USACOE LITTLE CYPRESS CREEK (TN) 95-000 [TF] SITE	USACOE-M	
1307	USACOE LOOSAHATCHIE RIVER SITE	USACOE-M	
1308	USACOE LOOSAHATCHIE RIVER-34 9TD0 SITE	USACOE-M	
1309	USACOE LOOSAHATCHIE RIVER 94-000 [TD] SITE	USACOE-M	
1310	USACOE LOOSAHATCHIE RIVER 95-001 [TS] SITE	USACOE-M	
1311	USACOE LOOSAHATCHIE RIVER 95-002 [TS] SITE	USACOE-M	
1312	USACOE LOOSAHATCHIE RIVER 95-003 [TS] SITE	USACOE-M	
1313	USACOE LOOSAHATCHIE RIVER 95-004 [TS] SITE	USACOE-M	
1314	USACOE LOOSAHATCHIE RIVER 95-009 [TD] SITE	USACOE-M	
1315	USACOE LOOSAHATCHIE RIVER 95-010 [TS] SITE	USACOE-M	
1316	USACOE LOOSAHATCHIE RIVER 96-002 [TF] SITE	USACOE-M	
1318	USACOE LOOSAHATCHIE RIVER 96-007 [TS] SITE	USACOE-M	

1319	USACOE LOOSAHATCHIE RIVER/BIG CREEK-25A SITE	USACOE-M	
1320	USACOE LOOSAHATCHIE RIVER/HOWARD CREEK SITE	USACOE-M	
1321	USACOE LOOSAHATCHIE RIVER TRIBUTARIES SITE	USACOE-M	
1322	USACOE LOOSAHATCHIE RIVER: UNNAMED TRIBUTARY SITE	USACOE-M	
1323	USACOE LOOSAHATCHIE RIVER: UNNAMED TRIBUTARY SITE	USACOE-M	
1438	USACOE JEFF HUDSON PERMIT SITE	USACOE-M	
1495	USACOE-LMM LOOSAHATCHIE RIVER 95-150 SITE	USFWS	
1660	USACOE N. FORK NONCONNAH CRK/BEAVER CREEK: OLIVER BRANCH	USACOE-M	
1678	USACOE NONCONNAH CREEK-50 SITE	USACOE-M	
1737	USACOE LOOSAHATCHIE RIVER/CYPRESS CREEK-22 (FL)	USACOE-M	
1738	USACOE LOOSAHATCHIE RIVER-23 9FL0 SITE	USACOE-M	
1739	USACOE LOOSAHATCHIE RIVER/BIG CREEK-25-TD SITE	USACOE-M	
1740	USACOE LOOSAHATCHIE RIVER-29 (JO) SITE	USACOE-M	
1741	USACOE LOOSAHATCHIE RIVER-34-TD SITE	USACOE-M	
1742	USACOE LOOSAHATCHIE RIVER-34-TD SITE	USACOE-M	
1743	USACOE BIG CREEK, TN-2 SITE	USACOE-M	
1745	USACOE LOOSAHATCHIE RIVER-3	USACOE-M	
1747	USACOE LOOSAHATCHIE RIVER-5 SITE	USACOE-M	
1748	USACOE LOOSAHATCHIE RIVER-9A SITE	USACOE-M	
1749	USACOE LOOSAHATCHIE RIVER-10 SITE	USACOE-M	
1750	USACOE LOOSAHATCHIE RIVER-13 SITE	USACOE-M	
1751	USACOE LOOSAHATCHIE RIVER-14 SITE	USACOE-M	
1753	USACOE LOOSAHATCHIE RIVER-17 SITE	USACOE-M	
1754	USACOE LOOSAHATCHIE RIVER-20 DETAIL 1 SITE	USACOE-M	
1755	USACOE LOOSAHATCHIE RIVER-20 DETAIL 2 SITE	USACOE-M	
1761	USACOE WOLF RIVER-73 (TF) SITE	USACOE-M	
1767	USACOE WOLF RIVER 95-004 [TF] MITIGATION SITE	USACOE-M	
1801	USACOE LOOSAHATCHIE RIVER-1 SITE	USACOE-M	
1830	NRCS SITE	NRCS	
1831	NRCS SITE	NRCS	
1832	NRCS SITE	NRCS	
1833	NRCS SITE	NRCS	
1861	NRCS SITE	NRCS	
2369	TWRA LOOSAHATCHIE RIVER SITE	TWRA	
2370	TWRA LOOSAHATCHIE RIVER SITE	TWRA	
2372	TWRA LOOSAHATCHIE RIVER SITE	TWRA	
2373	TWRA LOOSAHATCHIE RIVER SITE	TWRA	
2374	TWRA LOOSAHATCHIE RIVER SITE	TWRA	
2574	TWRA WOLF RIVER SITE	TWRA	
2710	USGS WETLAND AT MILLINGTON, TN SITE	USGS	OPEN-FILE REPORT 95-715
2783	USACOE NONCONNAH CREEK 96-065 [TF] SITE	USACOE-M	960340650

Table A2-4. Wetland Sites in Loosahatchie Watershed in TDEC Database. *TDEC, Tennessee Department of Environment and Conservation; USACOE, United States Army Corps of Engineers-Memphis District; WPC, Water Pollution Control; TDOT, Tennessee Department of Transportation' USFWS, United States Fish and Wildlife Service; TWRA, Tennessee Wildlife Resources Agency; DNH, Division of Natural Heritage, NRCS, Natural Resources Conservation Service.* ***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)
Bennett's Creek	TN08010209012_1000	44.5
Little Cypress Creek	TN08010209015_1000	47.9
Loosahatchie River	TN08010209007_1000	9.6
Loosahatchie River	TN08010209011_1000	5.8
Loosahatchie River	TN08010209011_2000	14.1

Table A3-1a. Streams Fully Supporting Designated Uses in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment*

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Beaver Creek	TN08010209016_1000	28.9
Big Creek	TN08010209021_1000	19.5
Cypress Creek	TN08010209003_1000	20.5
Davis Creek	TN08010209010_1000	36.9
Little Laurel Creek Canal	TN08010209014_1000	38.2
Loosahatchie River	TN08010209002_2000	8.2
Loosahatchie River	TN08010209004_1000	10.0
Middle Beaver Creek	TN08010209016_0300	44.8
Oliver Creek	TN08010209002_0100	7.4
Upper Middle Beaver Creek	TN08010209016_2000	26.7
West Beaver Creek Canal	TN08010209016_0100	56.6

Table A3-1b. Streams Partially Supporting Designated Uses in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Todd Branch	TN08010209001_0100	4.9
Loosahatchie River	TN08010209001_1000	7.8
Loosahatchie River	TN08010209002_1000	10.3

Table A3-1c. Streams Not Supporting Designated Uses in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Baxter Bottom	TN08010209016_0410	38.1
Bear Creek	TN08010209021_0110	14.5
Big Creek	TN08010209021_2000	30.9
Big Creek	TN08010209021_3000	35.1
Black Ankle Creek	TN08010209004_0100	27.0
Cane Creek	TN08010209015_0100	8.6
Casper Creek	TN08010209021_0400	8.6
Crooked Creek Canal	TN08010209021_0500	34.7
East Beaver Creek	TN08010209016_0400	84.5
Howell Creek	TN08010209011_0100	9.4
Jakes Creek	TN08010209021_0100	22.8
Kelley Branch	TN08010209016_0200	18.5
Kings Creek	TN08010209011_0200	15.9
Misc. Tribs	TN08010209001_0999	18.3
Misc. Tribs	TN08010209002_0999	143.4
Misc. Tribs	TN08010209003_0999	95.1
Misc. Tribs	TN08010209011_0999	25.2
Misc. Tribs.	TN08010209004_0999	50.2
Misc. Tribs.	TN08010209007_0999	58.4
Misc. Tribs.	TN08010209011_0998	32.5
Misc. tribs.	TN08010209021_0999	85.0
North Fork Creek	TN08010209021_0300	37.6
Royster Creek	TN08010209021_0200	37.4
Treadville Botttom	TN08010209008_1000	45.1
Weber Branch	TN08010209004_0200	9.7
Wilder Creek	TN08010209015_0200	14.3

Table A3-1d. Streams Not Assessed in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
Casper Lake	TN08010209casperlake_1000	81.0

Table A3-1e. Lakes Not Assessed in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Beaver Creek	TN08010209016_1000	28.9	Partial
Cypress Creek	TN08010209003_1000	20.5	Partial
Little Laurel Creek Canal	TN08010209014_1000	38.2	Partial
Loosahatchie River	TN08010209001_1000	7.8	Not supporting
Loosahatchie River	TN08010209002_2000	8.2	Partial
Loosahatchie River	TN08010209002_1000	10.3	Not supporting
Loosahatchie River	TN08010209004_1000	10.0	Partial
Middle Beaver Creek	TN08010209016_0300	44.8	Partial
Upper Middle Beaver Creek	TN08010209016_2000	26.7	Partial
West Beaver Creek Canal	TN08010209016_0100	56.6	Partial

Table A3-2a. Stream Impairment due to Habitat Alterations in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Big Creek	TN08010209021_1000	19.5	Partial
Todd Branch	TN08010209001_0100	4.9	Not supporting

Table A3-2b. Stream Impairment due to Organic Enrichment and Low Dissolved Oxygen Levels in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Beaver Creek	TN08010209016_1000	28.9	Partial
Big Creek	TN08010209021_1000	19.5	Partial
Cypress Creek	TN08010209003_1000	20.5	Partial
Loosahatchie River	TN08010209002_1000	10.3	Not supporting
Loosahatchie River	TN08010209002_2000	8.2	Partial
Middle Beaver Creek	TN08010209016_0300	44.8	Partial
Todd Branch	TN08010209001_0100	4.9	Not supporting
West Beaver Creek Canal	TN08010209016_0100	56.6	Partial

Table A3-2c. Stream Impairment due to Pathogens in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Beaver Creek	TN08010209016_1000	28.9	Partial
Big Creek	TN08010209021_1000	19.5	Partial
Loosahatchie River	TN08010209002_1000	10.3	Not supporting
Middle Beaver Creek	TN08010209016_0300	44.8	Partial
Oliver Creek	TN08010209002_0100	7.4	Partial
West Beaver Creek Canal	TN08010209016_0100	56.6	Partial

Table A3-2d. Stream Impairment due to Siltation in Loosahatchie River Watershed. *Data is based on Year 2000 Water Quality Assessment.*

APPENDIX IV

LAND USE/LAND COVER	AREAS IN HUC-10 SUBWATERSHEDS (ACRES)			
	01	02	03	04
Deciduous Forest	34,486	23,959	9,539	18,463
Emergent Herbaceous Wetlands				
Evergreen Forest	2,240	3,925	672	1,358
High Intensity: Commercial/Industrial/Transportation	169	1,048	91	509
High Intensity: Residential	96	2,479	53	1,460
Low Intensity: Residential	677	9,240	191	2,204
Mixed Forest	10,184	27,222	9,512	12,390
Open Water	914	2,360	376	783
Other Grasses: Urban/Recreational	37	614	9	504
Pasture/Hay	24,252	35,319	17,091	17,541
Row Crops	22,431	60,701	51,410	41,023
Transitional	140	156	15	77
Woody Wetlands	382	17,989	6,255	2,003
Bare Rock/Sand/Clay			1	9
Quarries/Strip Mines		251	2	5
Total	**96,010**	**185,262**	**95,216**	**98,329**

Table A4-1. Land Use Distribution in Loosahatchie River Watershed by HUC-10. *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.*

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.

STATION	HUC-10	AGENCY	NAME	AREA (SQ MILES)	LOW FLOW (CFS)		
					1Q10	7Q10	3Q20
07030240	0801020902	USGS	Loosahatchie River	262	68.8	71.5	67.4
LE111	0801020902	USACOE	Loosahatchie River				
07030280	0801020902	USGS	Loosahatchie River	505	55.7	57.3	49.8
07030270	0801020902	USGS	Clear Creek				
07030295	0801020902	USGS	Loosahatchie River				
07030245	0801020903	USGS	Kelly Branch				

Table A4-3. Historical Streamflow Data Summary Based on Mean Daily Flows in Loosahatchie River Watershed*. USGS, United States Geological Survey; USACOE, United States Army Corps of Engineers.*

PARAMETER	SUBWATERSHED	
	01	02
E. coli	A, C, D	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #
Fecal Coliform	A, C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Enterococcus	A, C, D	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #
Fecal Streptococcus	F	W, X, α
Acidity		
Alkalinity (Total)	A, C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, α, β, δ
BOD_5	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Conductivity (Field)	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α
COD (Low)		α
DO	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α
Hardness (Total)	A, C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
pH (Field)	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α
Residue (Settlable)	A, C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Residue (Suspended)	D, E, F	H, J, K, L, M, N, O, P, R, T, U, V, W, X, Y, Z, #, α, β, δ
Temperature	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α
Turbidity		W, X
Biological Monitoring	A	
Ammonia N	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
As	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Cd	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Chlorophyll a	F	α, β, δ
Cr (Total)	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Cu	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Hg	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Mn	E, F	α
N (Total Kjeldahl)		W, X, Z, α
Ni	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
NO_2+NO_3	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
P (Total)	A, C, D, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
Pb	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ
TOC		W, X
Zn	C, D, E, F	H, I, J, K, L, M, N, O, P, R, S, T, U, V, W, X, Y, Z, #, α, β, δ

PARAMETER	SUBWATERSHED	
	03	04
E. coli	π, ■	&
Fecal Coliform	π, ■, @	&, §
Enterococcus	π, ■	&
Fecal Streptococcus	@	§
Total Coliform		
Alkalinity (Total)	π, ■, @	&, §
BOD_5	π, ■, @	&, §
Conductivity (Field)	π, ■, @	&, §
COD (Low)	@	
DO	π, ■, @	&, §
Hardness (Total)	π, ■, @	&, §
pH (Field)	π, ■, @	&, §
Residue (Dissolved)	@	
Residue (Settlable)	π, ■, @	&, §
Residue (Suspended)	π, ■, @	&, §
Temperature	■,@	&, §
Ammonia N	π, ■, @	&, §
As	π, ■, @	&, §
Cd	π, ■, @	&, §
Chlorophyll a	@	
Cr (Total)	π, ■, @	&, §
Cu	π, ■, @	&, §
Hg	π, ■, @	&, §
Mn	@	§
N (Total Kjeldahl)	@	&
Ni	π, ■, @	&, §
NO_2+NO_3	π, ■, @	&, §
P (Total)	π, ■, @	&, §
Pb	π, ■, @	&, §
Zn	π, ■, @	&, §

Table A4-4a. Water Quality Parameters Monitored in the Loosahatchie River Watershed. *Codes are described in Table A4-4b.*

CODE	STATION	ALIAS	AGENCY	LOCATION
A	GRAYS005.8SH		TDEC	Grays Creek @ RM 5.8
B	HOWELL000.3FA		TDEC	Howell Creek @ RM 0.3
C	KINGS001.9FA		TDEC	Kings Creek @ RM 1.9
D	LOOSA050.3FA	001768	TDEC	Loosahatchie River @ RM 53.6
E	BENNETTS000.2		TDEC	Bennetts Creek @ RM 0.2
F	LOOSAHATCH045.3		TDEC	Loosahatchie River @ RM 45.3
G	BANK001.6FA		TDEC	Black Ankle Creek @ RM 1.6
H	CANE001.1SH		TDEC	Cane Creek At RM 1.1
I	HOWAR002.1SH		TDEC	Howard Creek @ RM 2.1
J	LOOSA1T1.9FA	LOOSATRIB01.9	TDEC	Unnamed Trib to Loosahatchie River @ RM 1.9
K	RANER001.9SH		TDEC	Raner Creek @ RM 1.9
L	ROCKY000.9SH		TDEC	Rocky Branch @ RM 0.9
M	SCOTT001.7SH	SCOTTS001.7SH	TDEC	Scotts Creek @ RM 1.7
N	TODD001.6SH	003700	TDEC	Todd Creek @ RM 1.6
O	WEBER001.3FA		TDEC	Weber Branch @ RM 1.3
P	WILDE001.3FA		TDEC	Wilder Creek @ RM 1.3
Q	07030240		USGS	Loosahatchie River near Arlington
R	BIG001.0SH	000300	TDEC	Big Creek @ RM 1.0
S	CYPRE010.8FA	001017	TDEC	Cypress Creek @ RM 10.8
T	GRACE001.3SH	001405	TDEC	
U	LYCPR008.5FA	001705	TDEC	Little Cypress Creek @ RM 8.5
V	LLAUR03.7FA	001712	TDEC	Little Laurel Creek @ RM 3.7
W	LOOSA028.6SH	001790	TDEC	Loosahatchie River @ RM 28.6
X	LOOSA005.0SH	001800	TDEC	Loosahatchie River @ RM 5.0
Y	TODD001.6SH	003700	TDEC	Todd Creek @ RM 1.6
Z	CLEAR001.4SH	CLEAR001.4	TDEC	Clear Creek @ RM 1.4
#	LCYPR003.3FA	LCYPRESS003.3	TDEC	Little Cypress Creek @ RM 3.3
$	LOOSAHATCH015.8		TDEC	Loosahatchie River @ RM 15.8
α	LOOSAHATCH017.2		TDEC	Loosahatchie River @ RM 17.2
β	LOOSAHATCH022.7		TDEC	Loosahatchie River @ RM 22.7
γ	LOOSAHATCH030.2		TDEC	Loosahatchie River @ RM 30.2
δ	LOOSAHATCH035.5		TDEC	Loosahatchie River @ RM 35.5
π	BAXTE001.0SH		TDEC	Baxter Bottom @ RM 1.0
ψ	EBEAV1C6.4TI		TDEC	East Beaver Creek Canal @ RM 6.4
■	KELLY001.0TI		TDEC	Kelly Branch @ RM 1.0
▲	MBEAV1C9.2TI		TDEC	Middle Beaver Creek Canal @ RM 9.2
♠	07030242		USGS	East Beaver Creek Canal Trib near Belmo
♣	07030243		USGS	Baxter Bottom @ Canaan Cove Road
♥	070302446		USGS	Middle Beaver Creek @ Highway 14
♦	07030246		USGS	Middle Beaver Creek near Gainsville
♫	070302481		USGS	West Beaver Creek Canal Trib near Moffatt Farm
Ω	07030249		USGS	West Beaver Creek Canal Trib @ Wilson Farm
∆	070302491		USGS	Wetland Cell Inlet @ Middle Beaver Creek Canal
√	070302492		USGS	Wetland Cell Inlet @ Middle Beaver Creek Canal

¥	07030250		USGS	Beaver Creek near Arlington
£	BEAVERCKCN01.0		TDEC	Beaver Creek @ RM 1.0
@	WBEAVRCKCAN01		TDEC	West Beaver Creek @ RM 1.1
&	BIG013.6SH	BIG013.6	TDEC	Big Creek @ RM 13.6
§	BIG08.4		TDEC	Big Creek @ RM 8.4

Table A4-4b. Water Quality Monitoring Stations in the Loosahatchie River Watershed*. TDEC, Tennessee Department of Environment and Conservation; USGS, United States Geologic Survey; TVA, Tennessee Valley Authority; NPS, National Park Service.*

FACILITY NUMBER	FACILITY NAME	SIC	SIC NAME	MADI	WATERBODY	HUC-10
TN0023744	Jefferson School	4952	Sewerage System	Minor	Smart Creek @ RM 4.7	0801020901
TN0061441	Fayette Academy	4952	Sewerage System	Minor	Unnamed Trib to Jones Creek@ RM 3.6	0801020901
TN0073768	MAPCO Express #2016	5541	Gasoiline Service Station	Minor	Open Ditch to Loosahatchie Canal	0801020901
TN0000141	PCS Nitrogen Fertilizer	2873	Nitrogenous Fertilizers	Minor	WWC to Loosahatchie River @ RM 11.7	0801020902
TN0000965	Air Liquide America	2813	Industrial Gases	Minor	WWC to Loosahatchie River @ RM 11.8	0801020902
TN0001091	E.I. Dupont & Company	2819	Inorganic Dyes	Major	Loosahatchie River @ RM 11.8	0801020902
TN0021351	Arlington Lagoon #1	4952	Sewerage System	Major	Loosahatchie River @ RM 30.7	0801020902
TN0066800	Bartlett STP #1	4952	Sewerage System	Major	Loosahatchie @ RM 18.4	0801020902
TN0067113	Memphis LG&W Pumping Station	4941	Water Supply	Minor	Unnamed Trib to Loosahatchie River @ RM 2.2	0801020902
TN0068543	Bartlett STP #2	4952	Sewerage System	Minor	Loosahatchie River @ RM 24.0	0801020902
TN0074012	Lakeland Lagoon	4952	Sewerage System	Minor	Loosahatchie River @ RM 24.1	0801020902
TN0023795	Northwest School	4952	Sewerage System	Minor	Unnamed Trib to Beaver Creek @ RM 3.6	0801020903
TN0021067	Millington STP #2	4952	Sewerage System	Major	Big Creek @ RM 6.9	0801020904
TN0026361	Memphis-Chapel Hill SD STP	4952	Sewerage System	Minor	Unnamed Trib to Unnamed Trib to Crooked Creek @ RM 3.0	0801020904
TN0065277	Mallard Ridge Mobile Estates	4952	Sewerage System	Minor	Unnamed Trib to North Fork Creek @ RM 4.7	0801020904
TN0056863	Camelia Homes	4952	Sewerage System	Minor	Unnamed Trib to Big Creek @ RM 22.1	0801020904

Table A4-5. Active Permitted Point Source Facilities in the Loosahatchie River Watershed. *SIC, Standard Industrial Classification; MADI, Major Discharge Indicator; WWC, Wet Weather Conveyance.*

FACILITY NUMBER	FACILITY NAME	SIC	SIC NAME	WATERBODY	HUC-10
TN0071374	Chancellor and Son, Inc.	1442	Construction Sand and Gravel	Unnamed Trib to Loosahatchie	0801021102
TN0071021	Fowler Construction Co.	1442	Construction Sand and Gravel	Unnamed Trib to Cane Creek	0801021102
TN0071692	Memphis Stone and Gravel Company	1442	Construction Sand and Gravel	Cane Creek	0801021102
TN0066125	Memphis Stone and Gravel Company	1442	Construction Sand a nd Gravel	Beaver Creek Canal	0801021103
TN0066354	Memphis Stone and Gravel Company	1442	Construction Sand and Gravel	West Beaver Ck	0801021103
TN0071269	Memphis Stone and Gravel Company	1442	Construction Sand and Gravel	Unnamed Trib to Crooked Fork Ck	0801021103
TN0066591	Standard Construction Company	1442	Construction Sand and Gravel	Unnamed Trib to Crooked Fork Ck	0801021103
TN0063185	Memphis Stone and Gravel Company	1442	Construction Sand and Gravel	Unnamed Trib to Crooked Fork Ck	0801021104

Table A4-6. Active Permitted Mining Sites in the Loosahatchie River Watershed. *SIC, Standard Industrial Classification.*

FACILITY NUMBER	FACILITY NAME	SECTOR	RECEIVING STREAM	AREA*	HUC-10
TNR051866	Willoughby, Incorporated	P	Ditch to Loosahatchie River	1.0	0801020901
TNR053013	Fowler Paving Company	D, E, P	James Creek	4.0	0801020901
TNR054557	Security Signals, Inc.	AA	Jones Creek	125.9	0801020901
TNR050198	PCS Nitrogen Fertilizer	C	Loosahatchie River	70.0	0801020902
TNR050242	Plant Maintenance Service	AA	Loosahatchie River	5.5	0801020902
TNR050316	Ring Can Corporation	Y, P	Cypress Creek	18.0	0801020902
TNR050871	Specialty Alloys Corp.	F	Loosahatchie River	5.0	0801020902
TNR050988	Woodstock CO_2 Plant (Air Liquide)	C	Loosahatchie River	1.6	0801020902
TNR051061	Osmose Wood, Inc.	C	Unnamed Trib to Loosahatchie Canal	2.1	0801020902
TNR051390	Morningstar Foods, Inc.	U	Unnamed Trib to Clear Ck, Clear Creek Canal, Loosahatchie River	12.7	0801020902
TNR051487	INEOS Acrylics, Inc.	C, Y, P	Goat Creek	8.9	0801020902
TNR051499	Wright Medical Tech	AC	Ditch to Loosahatchie Lateral A to Cypress Creek	2.1	0801020902
TNR051594	Safety-Kleen, Incorporated	L	Unnamed Trib to Loosahatchie River	5.0	0801020902
TNR053123	Delta Industrial Coatings	C	Ditch to Loosahatchie Drainage Canal	2.0	0801020902
TNR053260	Charles Baker Airport	S	Unnamed Trib to Loosahatchie River	259.0	0801020902
TNR053304	Miller Transporeters	P	Loosahatchie River	5.7	0801020902
TNR053498	Quickcrete	E	Loosahatchie River	5.6	0801020902
TNR053815	Simpson Auto Parts	M	Unnamed Trib to Loosahatchie River	9.0	0801020902
TNR053857	Pollution Control Industries	L	Loosahatchie River	16.0	0801020902
TNR054267	Grisham Corporation	AA	Loosahatchie River	5.4	0801020902
TNR054486	Precast Concrete Products	E	Unnamed Trib to Cane Ck	6.3	0801020902
TNR055050	Vollrath Corporation	Y	Little Cypress Creek	27.4	0801020902
TNR055061	M&D Coatings, Inc.	AA	Loosahatchie River	8.0	0801020902
TNR055896	B & B Recycled Auto Parts	M		9.7	0801020902
TNR051239	Midwest Zinc-Millington	F	Unnamed trib to Loosahatchie River	17.0	0801020902
TNR050646	Sandusky Cabinets, Inc.	AA	Big Creek	0.5	0801020904
TNR051012	A&R Auto Salvage	M, N, P	Big Branch creek	5.2	0801020904
TNR051519	Active Foreign Auto Parts	M	Big Creek Canal	12.0	0801020904
TNR051711	Environ. Transportation	P	WWC to Unnmamed Trib to Hebron Branch	2.0	0801020904
TNR053248	BFI North Shelby Landfill	L	Unnamed Trib to Big Creek	959.0	0801020904
TNR053508	Navsuppact Mid-South	AD	Big Creek	1584.0	0801020904
TNR053735	Millington Airport	S	North Fork Creek	537.0	0801020904

Table A4-7. Active Permitted TMSP Facilities in the Loosahatchie River Watershed. *Area, acres of property associated with industrial activity; WWC, Wet Weather Conveyance. Sector details may be found in Table A4-8.*

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 A4-8. TMSP Sectors and Descriptions.

FACILITY NUMBER	PERMITEE	COUNTY	LIVESTOCK	WATERBODY	HUC-10
TNA000022	Thomas Dairy	Fayette	Dairy	Cypress Creek	0801020902

Table A4-9. CAFO Sites in the Loosahatchie River Watershed.

LOG NUMBER	COUNTY	DESCRIPTION	WATERBODY	HUC-10
98.212	Shelby	Stream Relocation	Unnamed Trib to Fletcher Creek	0801020901
98.218	Fayette	Rip-rap	Town Branch	0801020901
98.041	Fayette	Bridge Scour Repair	Loosahatchie River	0801020902
98.042	Fayette	Bridge Scour Repair	Little Cypress Creek	0801020902
98.084	Shelby	Bridge Scour Repair	Loosahatchie River	0801020902
98.558	Shelby	Evacuate In-Stream Pond	Unnamed Trib to Oliver Creek	0801020902
98.685	Fayette	Stream Relocation	Unnamed Trib to Black Ankle Ck	0801020902
98.724	Shelby	Stream Relocation	Unnamed Trib to Fletcher Creek	0801020902
98.726	Shelby	Culvert	Unnamed Trib to Fletcher Creek	0801020902
99.462	Shelby	Sea Wall	Garner Lake	0801020902

Table A4-10. Individual ARAP Permits Issued January 1994 Through June 2000 in Loosahatchie River Watershed.

FACILITY NUMBER	PERMITEE	RECEIVING STREAM	HUC-10
TNG110182	City Concrete Company	Loosahatchie River @ RM 1.0	0801020902
TNG110148	Carrier Excavation Company	Loosahatchie River	0801020902
TNG110201	51 Concrete	Wet Weather Conveyance to Loosahatchie River	0801020902
TNG110016	D & S ready Mix	North Fork to Big Creek	0801020904

Table A4-9. Ready Mix Concrete Plant (RMCP) Sites in the Loosahatchie River Watershed.

APPENDIX V

CONSERVATION PRACTICE	UNITS	AMOUNT
Alley Cropping	Acres	0
Contour Buffer Strips	Acres	0
Crosswind Trap Strips	Acres	0
Field Borders	Feet	0
Filter Strips	Acres	429
Grassed Waterways	Acres	0
Riparian Forest Buffers	Acres	58
Streambank and Shoreline Protection	Feet	0
Windbreaks and Shelterbelts	Feet	0
Hedgerow Plantings	Feet	0
Herbaceous Wind Barriers	Feet	0
Total Conservation Buffers	Acres	486

Table A5-1a. Conservation Buffers Conservation Practices in Partnership with NRCS in Loosahatchie River Watershed. *Data are from Performance & Results Measurement System (PRMS) for October 1, 2001 through September 30, 2002 reporting period.*

PARAMETER	TOTAL
Erosion Reduction Applied (Acres)	5,708
Highly Erodible Land With Erosion Control Practices (Acres)	3,824
Estimated Annual Soil Saved By Erosion Control Measures (Tons/Year)	51,243
Total Estimated Soil Saved (Tons/Year)	51,243

Table A5-1b. Erosion Control Conservation Practices in Partnership with NRCS in Loosahatchie River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2002 reporting period.*

PARAMETER	TOTAL
Acres of AFO Nutrient Management Applied	2,280
Acres of Non-AFO Nutrient Management Applied	1,760
Total Acres Applied	4,040

Table A5-1c. Nutrient Management Conservation Practices in Partnership with NRCS in Loosahatchie River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2002 reporting period.*

PARAMETER	TOTAL
Acres of Pest Management Systems Applied	4,558

Table A5-1d. Pest Management Conservation Practices in Partnership with NRCS in Loosahatchie River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2002 reporting period.*

CONSERVATION PRACTICE	ACRES
Acres Prepared for Revegetation of Forestland	162
Acres Improved Through Forest Stand Improvement	0
Acres of Tree and Shrub Establishment	208

Table A5-1e. Tree and Shrub Conservation Practices in Partnership with NRCS in Loosahatchie River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2002 reporting period.*

CONSERVATION PRACTICE	ACRES
Acres of Upland Habitat Management	2,788
Acres of Wetland Habitat Management	0
Total Acres Wildlife Habitat Management	2,788

Table A5-1f. Wildlife Habitat Management Conservation Practices in Partnership with NRCS in Loosahatchie River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2002 reporting period.*

COMMUNITY	PROJECT DESCRIPTION	AWARD DATE	AWARD AMOUNT
Oakland	Wastewater Treatment Plant	08/09/01	2,421,000

Table A5-2. Communities in Loosahatchie River Watershed Receiving SRF Grants or Loans.

NRCS CODE	PRACTICE	NUMBER OF BMPs
340	Winter Cover	62
350	Sediment Basin	1
362	Diversion	5
378	Pond	4
386	Field Borders	1
410	Grade Stabilization	18
412	Grassed Waterway	1
512	Pasture Renovation	5
600	Terraces	16
638	WSC Basin	7

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