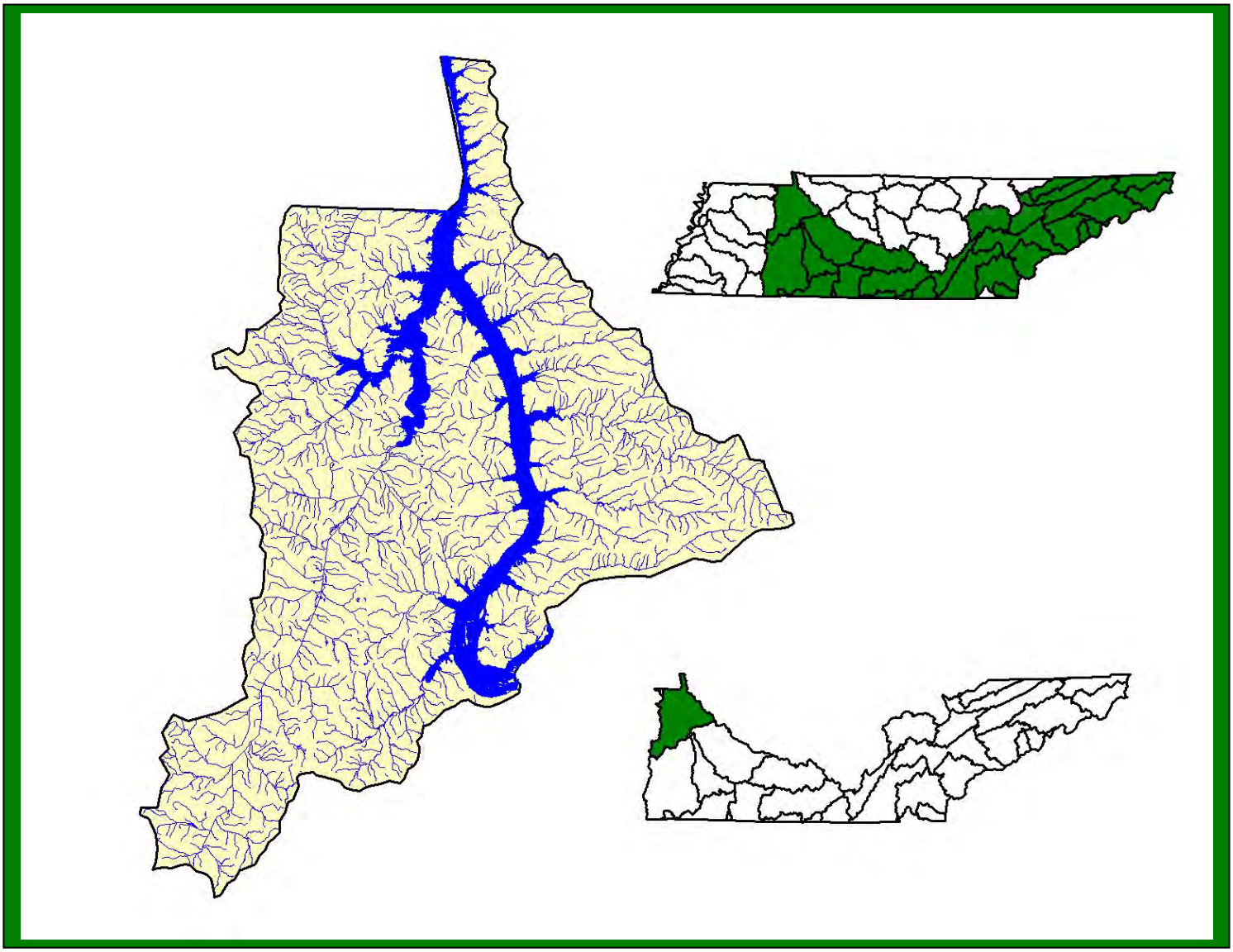
TENNESSEE WESTERN VALLEY (KY LAKE) WATERSHED (06040005) OF THE TENNESSEE RIVER BASIN 2005 WATERSHED WATER QUALITY MANAGEMENT PLAN



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

TENNESSEE WESTERN VALLEY (KY LAKE) WATERSHED WATER QUALITY MANAGEMENT PLAN

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GLOSSARY

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

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

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

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

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

AFO. Animal Feeding Operation.

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

ARAP. Aquatic Resource Alteration Permit.

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

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

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

Benthic. Bottom dwelling.

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

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

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

CAFO. Concentrated Animal Feeding Operation.

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

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

DO. Dissolved oxygen.

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

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

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

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

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

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

MRLC. Multi-Resolution Land Classification.

MS4. Municipal Separate Storm Sewer System.

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

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

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

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

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

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

SBR. Sequential Batch Reactor.

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

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

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

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

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

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

TMSP. Tennessee Multi-Sector Permit.

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

WAS. Waste Activated Sludge.

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

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

WET. Whole Effluent Toxicity.

WWTP. Waste Water Treatment Plant

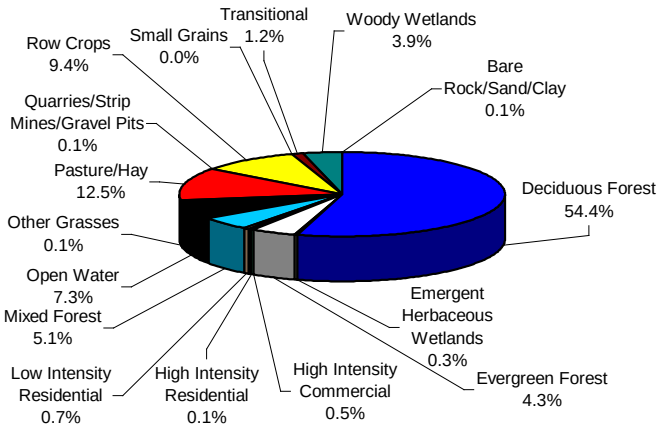
Summary – Tennessee Western Valley (Kentucky Lake)

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 Tennessee Western Valley (Kentucky Lake) 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.

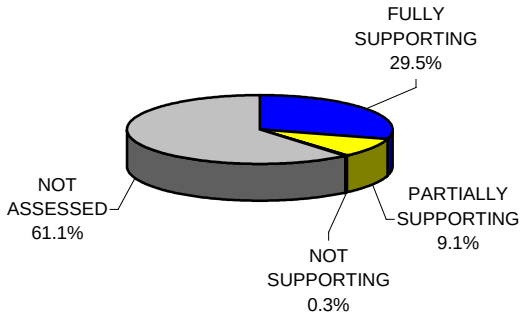
A detailed description of the watershed can be found in Chapter 2, to include information on location, population, hydrology, land use and natural and cultural resources. The Tennessee portion of the Tennessee Western Valley (Kentucky Lake) Watershed is approximately 1,460 square miles and includes parts of nine West Tennessee counties. A part of the Tennessee River drainage basin, the watershed has 2,043 stream miles and 100,000 lake acres in Tennessee.



Land Use Distribution in the Tennessee Portion of the Tennessee Western Valley (Kentucky Lake) Watershed.

There are three greenways, six interpretive areas, and eight wildlife management areas located in the watershed. Forty-eight rare plant and animal species have been documented in the watershed, including four rare fish species, four rare mussel species, and one rare crustacean species.

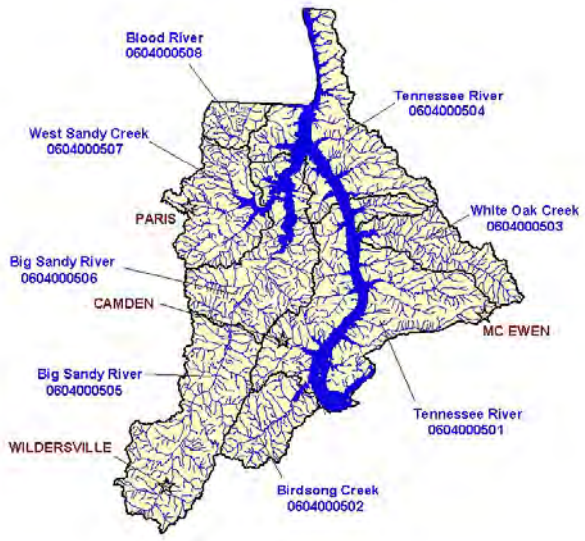
A review of water quality sampling and assessment is presented in Chapter 3. Using the Watershed Approach to Water Quality, 279 sampling events occurred in the Tennessee portion of the Tennessee Western Valley (Kentucky Lake) Watershed in 1999-2000. These were conducted at ambient, ecoregion or watershed monitoring sites. Monitoring results support the conclusion that 29.5% of total stream miles fully support designated uses.



Water Quality Assessment of Streams and Rivers in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. Assessment data are based on the 2002 Water Quality Assessment of 2,042.6 miles in the watershed.

Also in Chapter 3, a series of maps illustrate Overall Use Support in the watershed, as well as Use Support for the individual uses of Fish and Aquatic Life Support, Recreation, Irrigation, and Livestock Watering and Wildlife. Another series of maps illustrate streams that are listed for impairment by specific causes (pollutants) such as Habitat Alteration, Organic Enrichment/Low Dissolved Oxygen, Siltation, and Pathogens.

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



The Tennessee Portion of the Tennessee Western Valley (Kentucky Lake) Watershed is Composed of Eight USGS-Delineated Subwatersheds (10-Digit Subwatersheds).

Point source contributions to the Tennessee portion of the Tennessee Western Valley (Kentucky Lake) Watershed consist of 18 individual NPDES-permitted facilities, one of which discharges into streams that have been listed on the 1998 303(d) list. Other point source permits in the watershed are Aquatic Resource Alteration Permits (16), Tennessee Multi-Sector Permits (35), Mining Permits (21), Ready-Mix Concrete Plant Permits (5) and Water Treatment Plant Permits (2). 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 Tennessee Western Valley (Kentucky Lake) Watershed* and highlights partnerships between agencies and between agencies and landowners that are essential to success. Programs of federal agencies (Natural Resources Conservation Service, Tennessee Valley Authority, U.S. Fish and Wildlife Service and U.S. Geological Survey), and state agencies (TDEC Division of Community Assistance, TDEC Division of Water Supply, Tennessee Department of Agriculture and Kentucky Division of Water) are summarized. Local initiatives of active watershed organizations (Five Rivers RC&D Council) are also described.

Point and Nonpoint source approaches to water quality problems in the Tennessee portion of the Tennessee Western Valley (Kentucky Lake) 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 Tennessee Western Valley (Kentucky Lake) Watershed Water Quality Management Plan can be found at:
http://www.state.tn.us/environment/wpc/watershed/wsmplans/

CHAPTER 1

WATERSHED APPROACH TO WATER QUALITY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

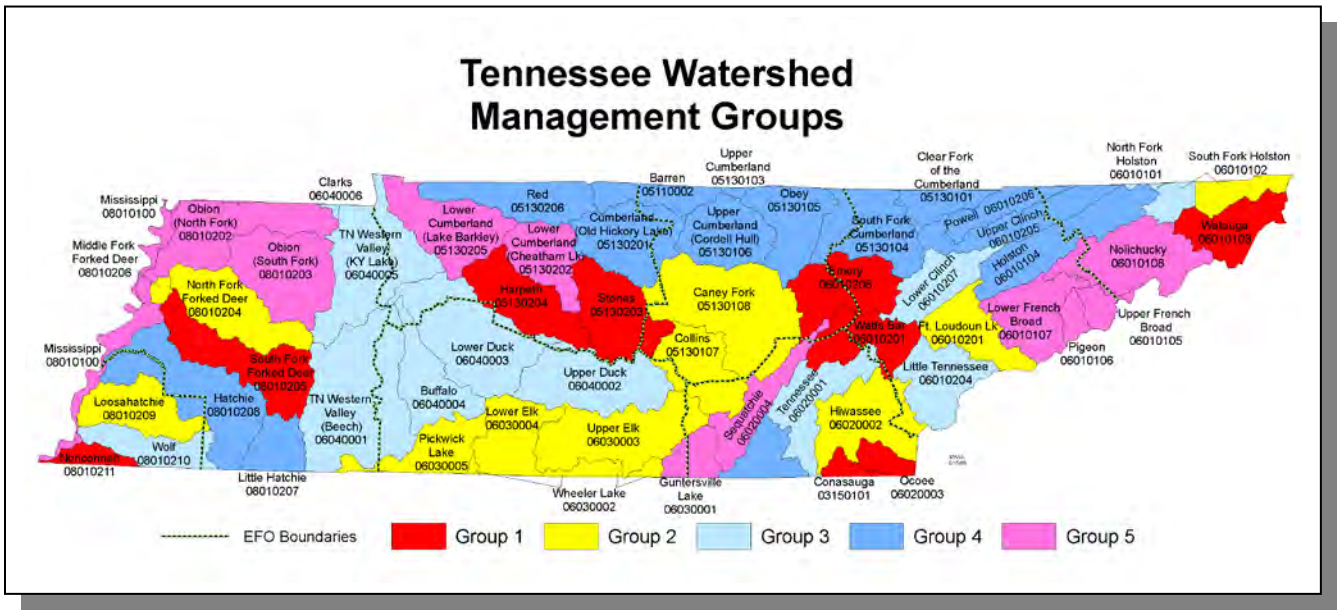


Figure 1-1. Watershed Groups in Tennessee's Watershed Approach to Water Quality.

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

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

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

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

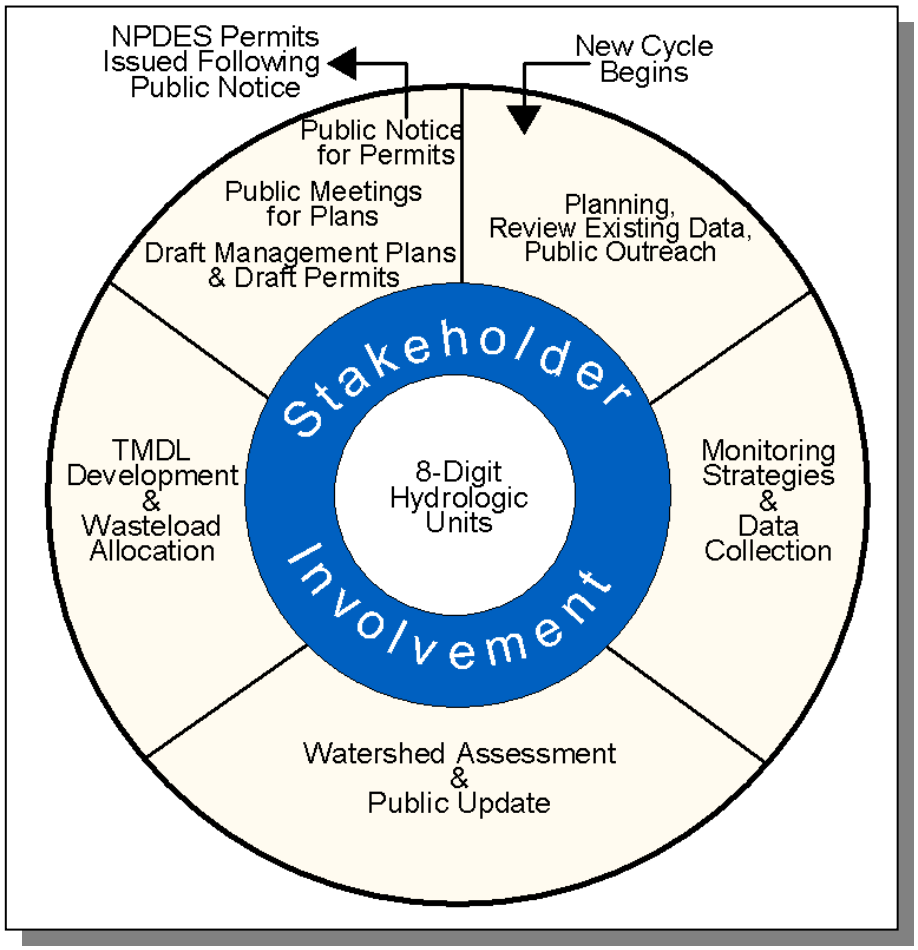


Figure 1-2. The Watershed Approach Cycle.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CHAPTER 2

DESCRIPTION OF THE TENNESSEE WESTERN VALLEY (KENTUCKY LAKE) WATERSHED

2.1. BACKGROUND. Kentucky Lake was created when TVA completed Kentucky Dam in 1944. The dam, located 22 miles upstream of the confluence of the Tennessee and Ohio Rivers, is 206 feet high and 8,422 feet long; it's the longest in the TVA system. The Western edge of the watershed defines the Tennessee Western Valley (to the west is the Mississippi River Valley). The watershed has been split into the upstream (Beech River) and downstream drainage areas (KY Lake).

This Chapter describes the location and characteristics of the Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location.

The Tennessee Western Valley (KY Lake) Watershed is located in Tennessee and Kentucky. The Tennessee portion of the watershed (80.7% of the watershed) includes parts of Benton, Carroll, Decatur, Dickson, Henderson, Henry, Houston, Humphreys, and Stewart Counties.

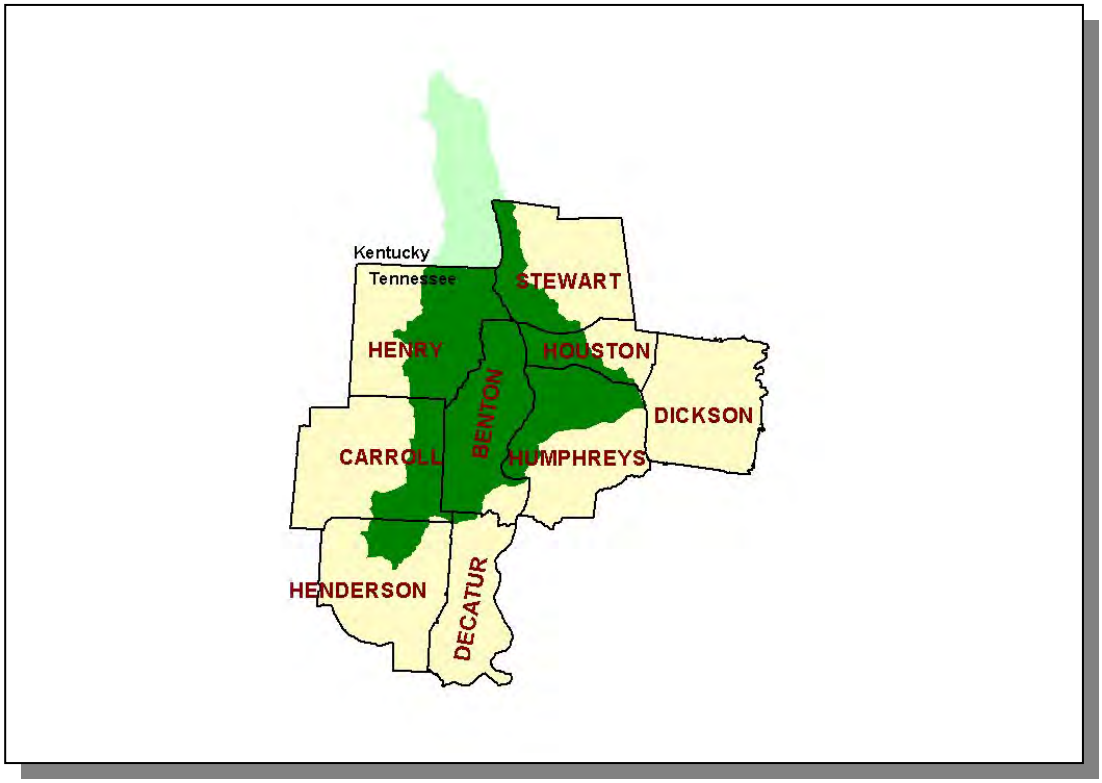


Figure 2-1. General Location of the Tennessee Portion of the Tennessee Western Valley (Kentucky Lake) Watershed. *Dark green, Tennessee portion; light green, Kentucky portion.*

COUNTY	% OF WATERSHED IN EACH COUNTY
Benton	26.0
Henry	22.5
Humphreys	17.0
Carroll	12.1
Stewart	10.2
Houston	6.7
Henderson	5.0
Decatur	0.5
Dickson	0.0

Table 2-1. The Tennessee Western Valley-KY Lake Watershed Includes Parts of Nine West Tennessee Counties. *Twenty-five acres (0.00002% of total acres) in Dickson County are in the watershed. Percentages are calculated for Tennessee portion of watershed.*

2.2.B. Population Density Centers. Five state highways and one interstate serve the major communities in the Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed.

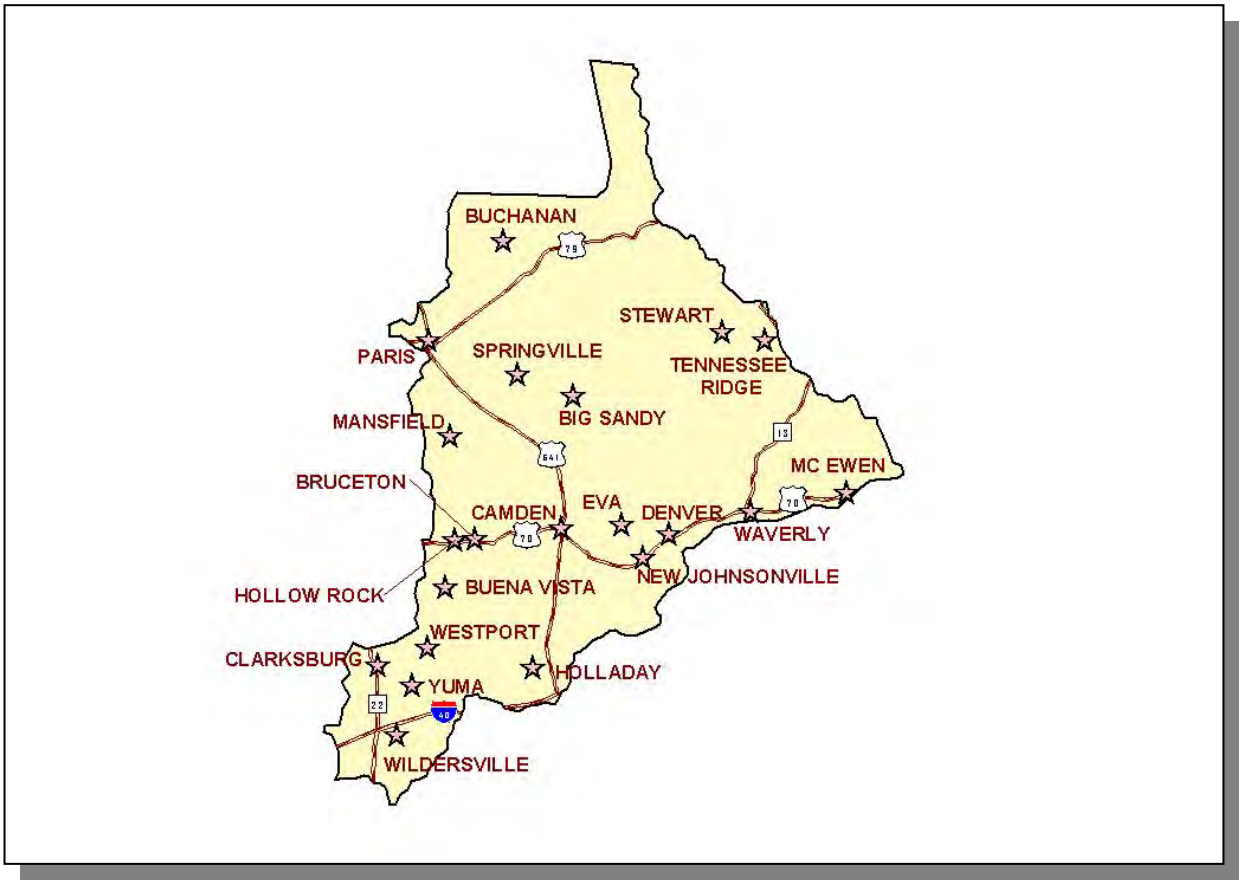


Figure 2-2. Municipalities and Roads in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.

MUNICIPALITY	POPULATION	COUNTY
Paris*	11,635	Henry
Camden*	4,526	Benton
Waverly*	4,436	Humphreys
New Johnsonville	2,099	Humphreys
Bruceton	1,581	Carroll
McEwen	1,552	Humphreys
Tennessee Ridge	1,421	Houston
Hollow Rock	965	Carroll
Big Sandy	583	Benton
Clarksburg	436	Carroll

Table 2-2. Communities and Populations in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Population based on 1999 census (Tennessee 2001/2002 Blue Book). Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Tennessee Western Valley (KY Lake) Watershed, designated 06040005 by the USGS, drains approximately 1,809 square miles, 1,460 square miles of which are in Tennessee, and empties to the Ohio River in Kentucky.

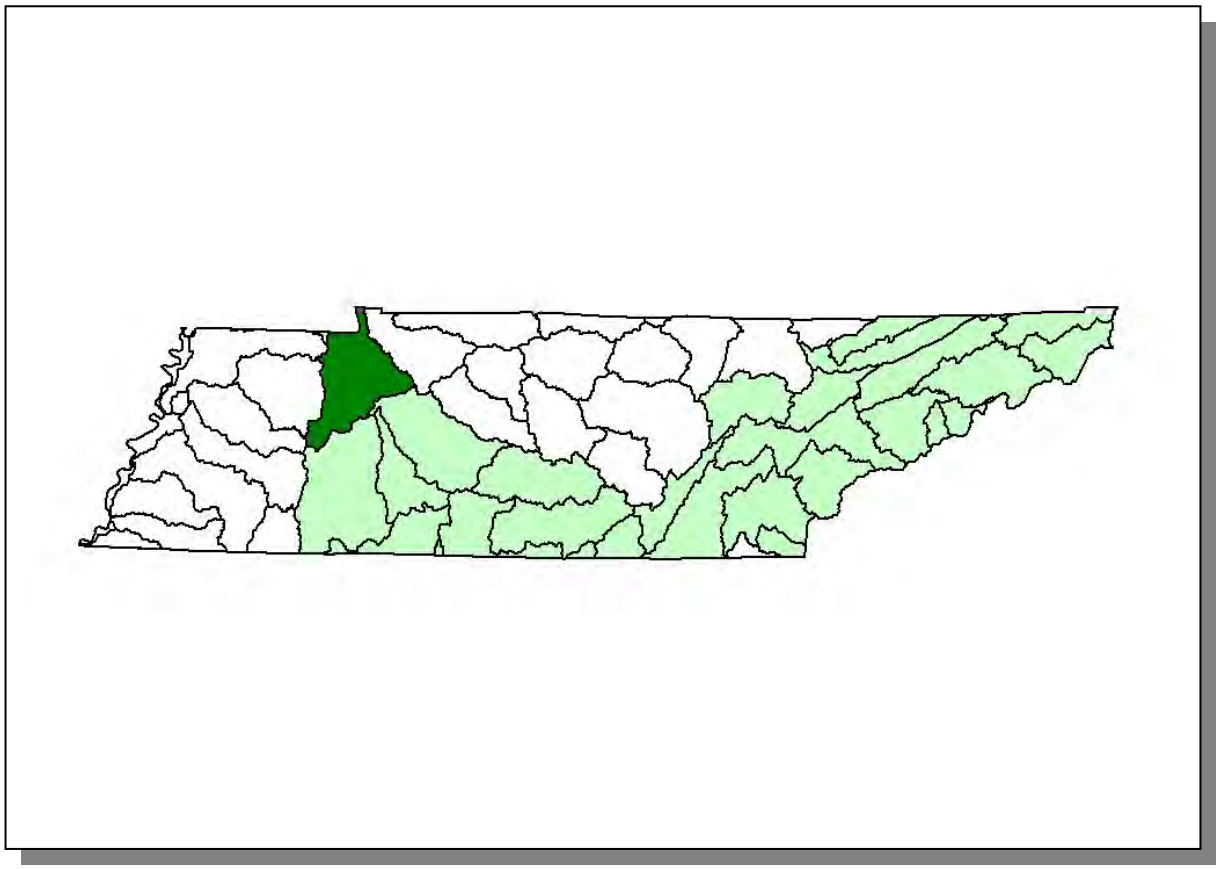


Figure 2-3. The Tennessee Western Valley (KY Lake) Watershed is Part of the Tennessee River Basin.

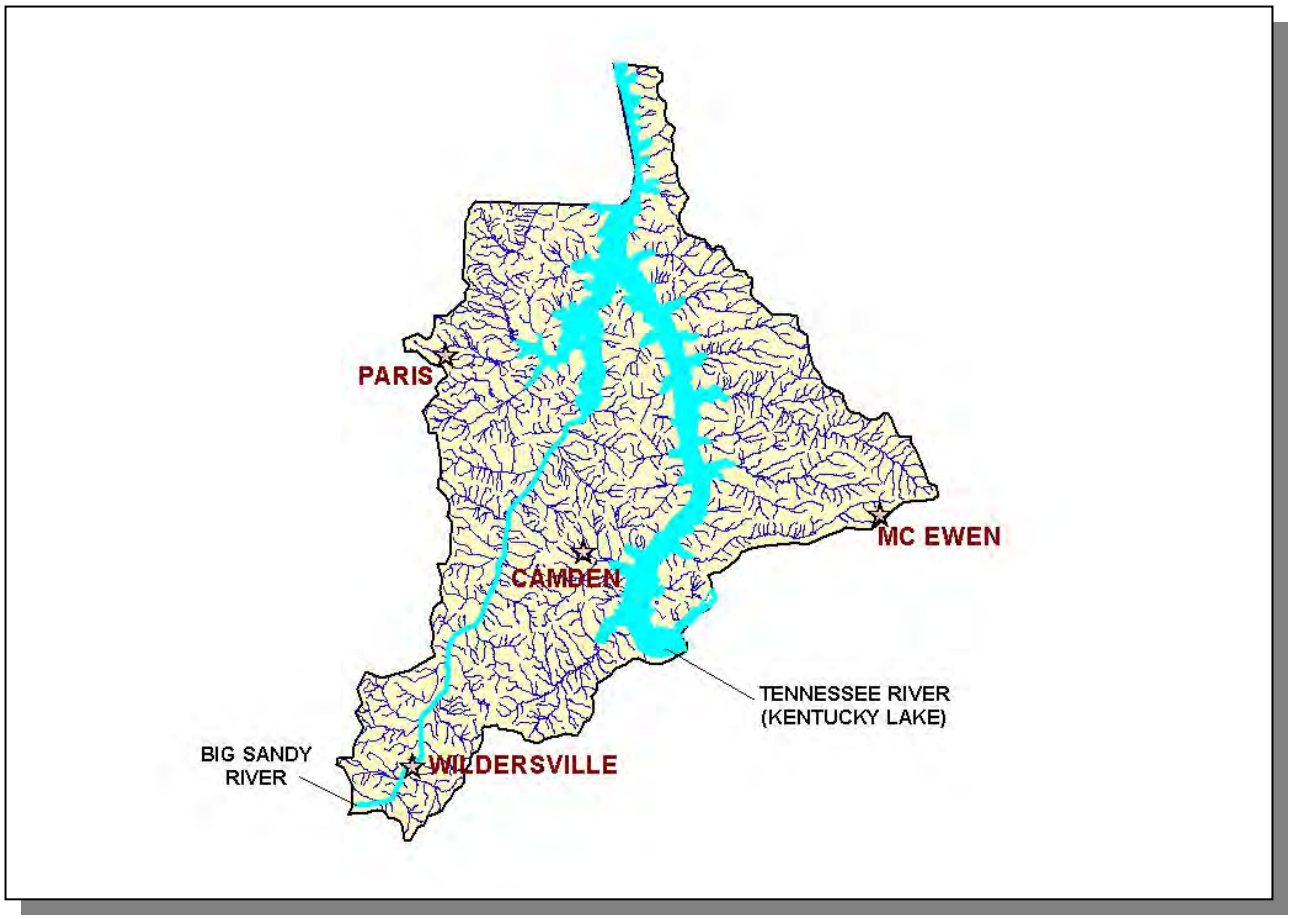


Figure 2-4. Hydrology in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *There are 2,043 stream miles and 100,000 lake acres in the Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed as catalogued in the assessment database. An additional 516 stream miles are located in the Kentucky portion of the watershed as catalogued in the River Reach File 3 database. Location of the Tennessee River (KY Lake) and Big Sandy River, and the cities of Camden, McEwen, Paris, and Wildersville are shown for reference.*

2.3.B. Dams. There are 21 dams inventoried by TDEC Division of Water Supply in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

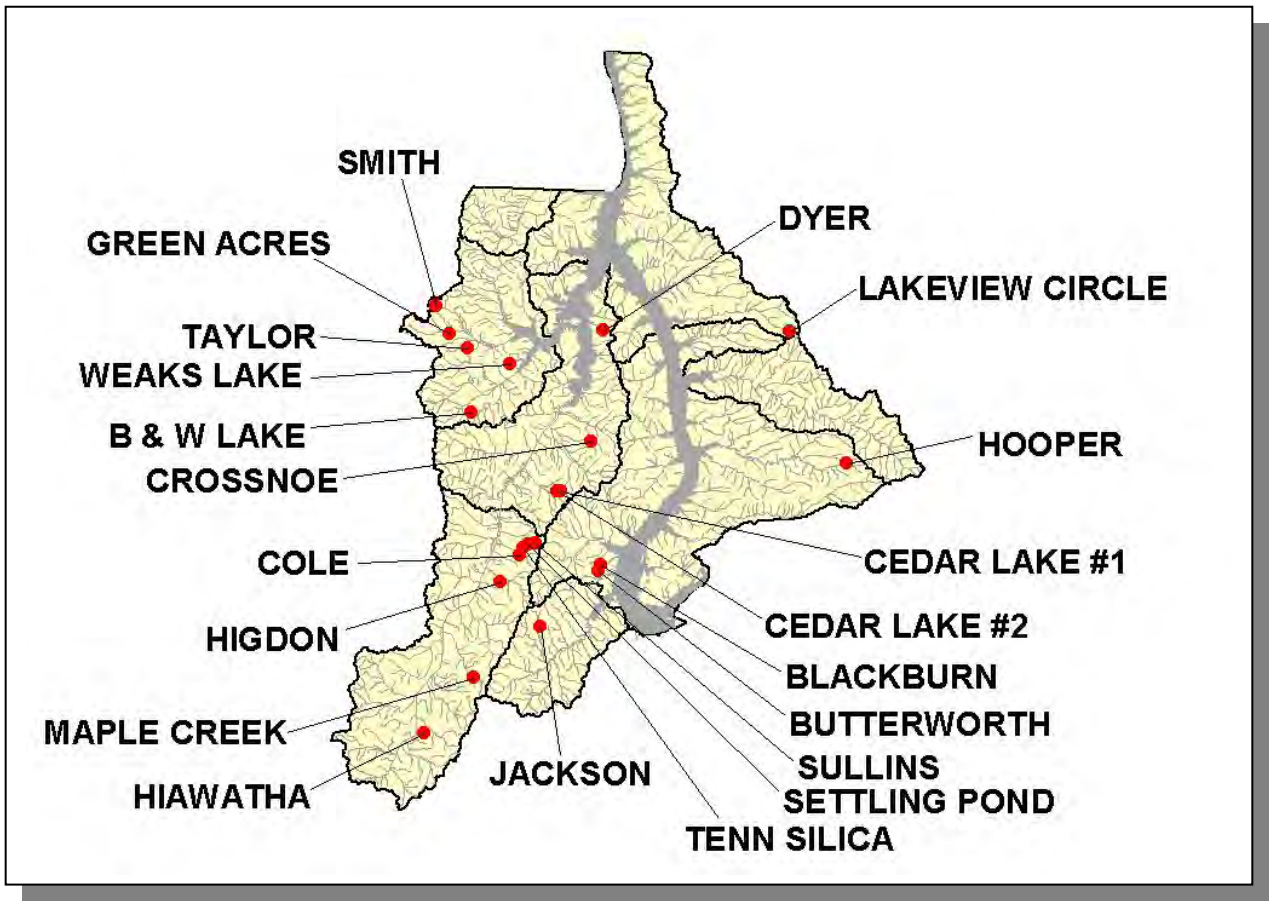


Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *More information is provided in Appendix II and on the TDEC homepage at http://gwidc.memphis.edu/website/dws/.*

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.

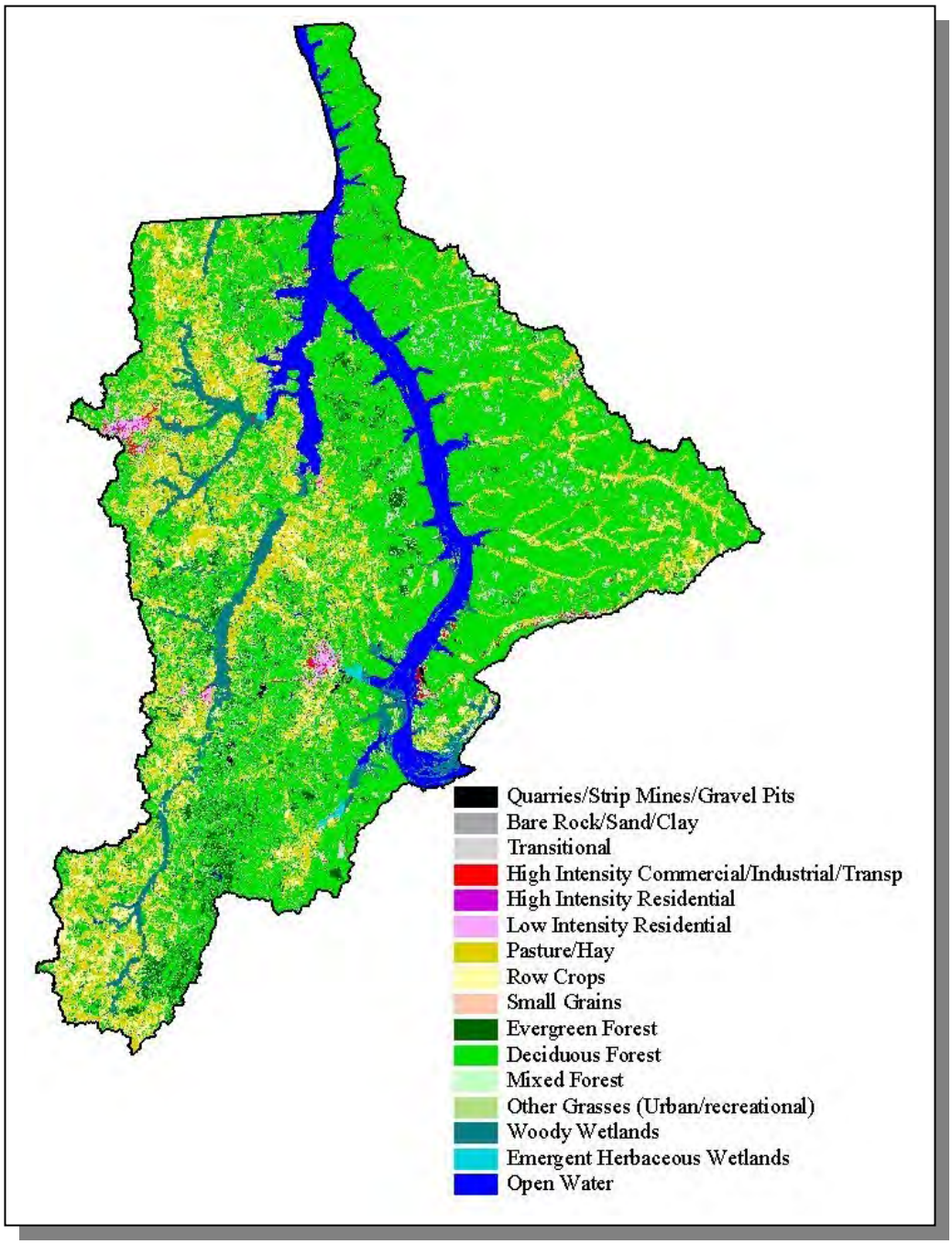


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery in the Group 3 Portion of the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.

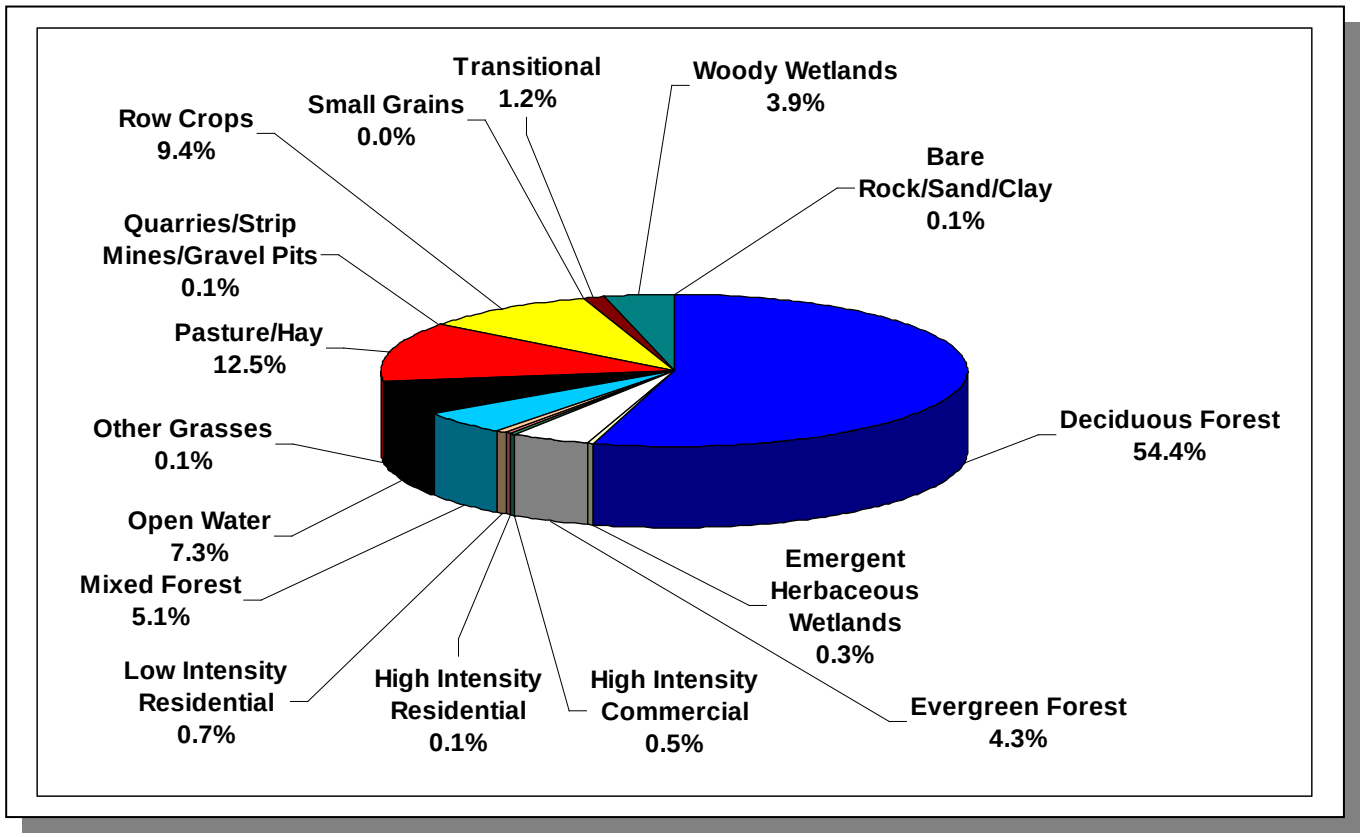


Figure 2-7. Land Use Distribution in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *More information is provided in Appendix II.*

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

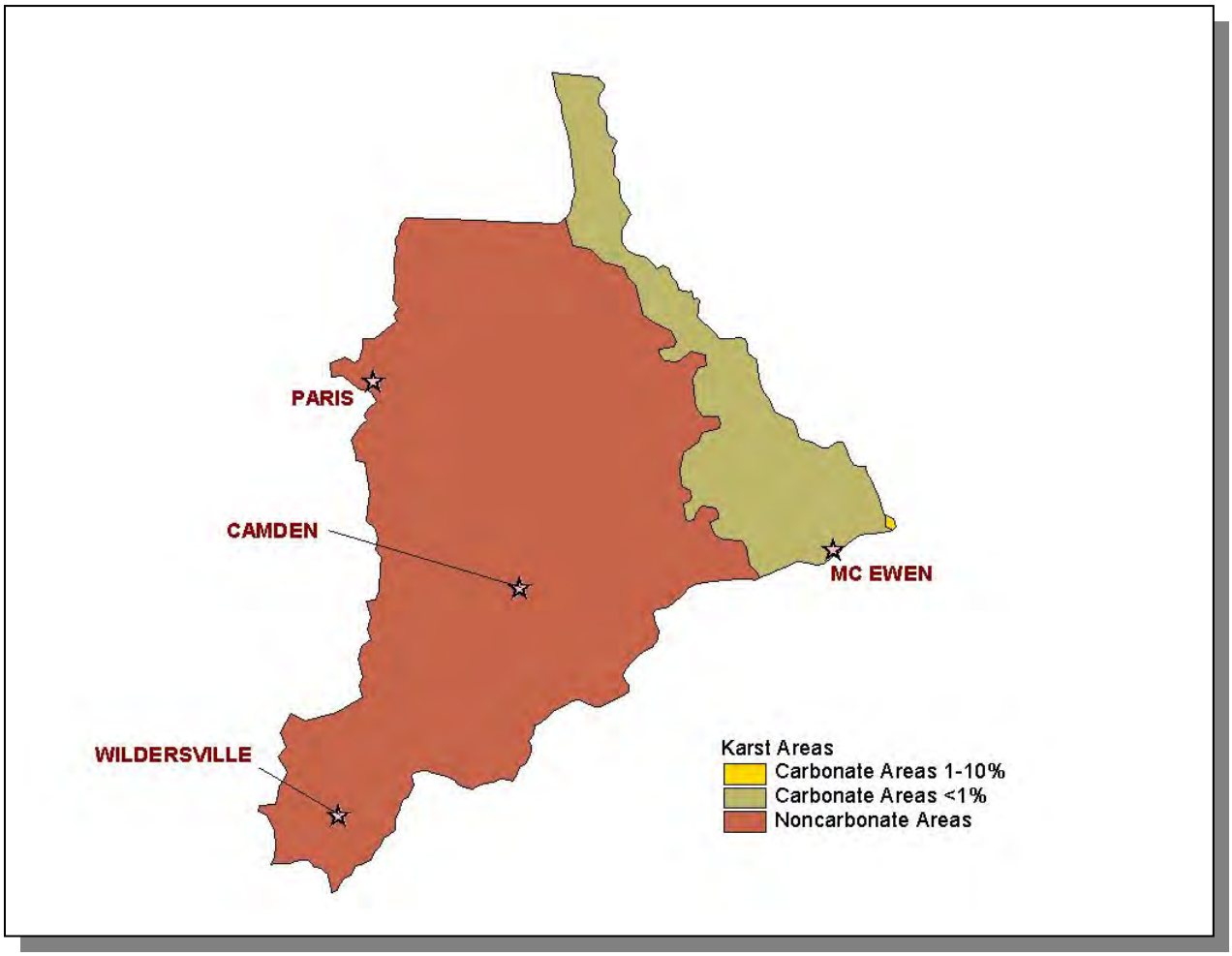


Figure 2-8. Illustration of Karst Areas in Tennessee Portion of Tennessee Western Valley (KY Lake) Watershed. *Locations of Camden, McEwen, Paris, and Wildersville are shown for reference.*

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

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed lies within 3 Level III ecoregions (Southeastern Plains, Interior Plateau, and Mississippi Valley Loess Plains) and contains 3 Level IV subecoregions:

- **Southeastern Plains and Hills (65e)** contain north-south trending bands of sand and clay formations. Tertiary-age sand, clay, and lignite are to the west, with Cretaceous fine sand, fossiliferous micaceous sand, and silty clays to the east. Elevations reach over 650 feet with more rolling topography and relief than the Loess Plains (74b) to the west. Streams have increased gradient, sandy substrates, and distinct faunal characteristics. Natural vegetation is oak-hickory forest, grading into oak-hickory-pine to the south.

- **Western Highland Rim (71f)** is characterized by dissected, rolling terrain of open hills, with elevations of 400-1000 feet. The geologic base of Mississippian-age limestone, chert, and shale is covered by soils that tend to be cherty and acidic with low to moderate fertility. Streams are relatively clear with a moderate gradient. Substrates are coarse chert, gravel and sand with areas of bedrock. The native oak-hickory forests were removed over broad areas in the mid-to late 1800's in conjunction with the iron-ore related mining and smelting of the mineral limonite, however today the region is again heavily forested. Some agriculture occurs on the flatter interfluves and in the stream and river valleys. The predominant land uses are hay, pasture, and cattle with some cultivation of corn and tobacco.

- **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. Most of the streams have been channelized.

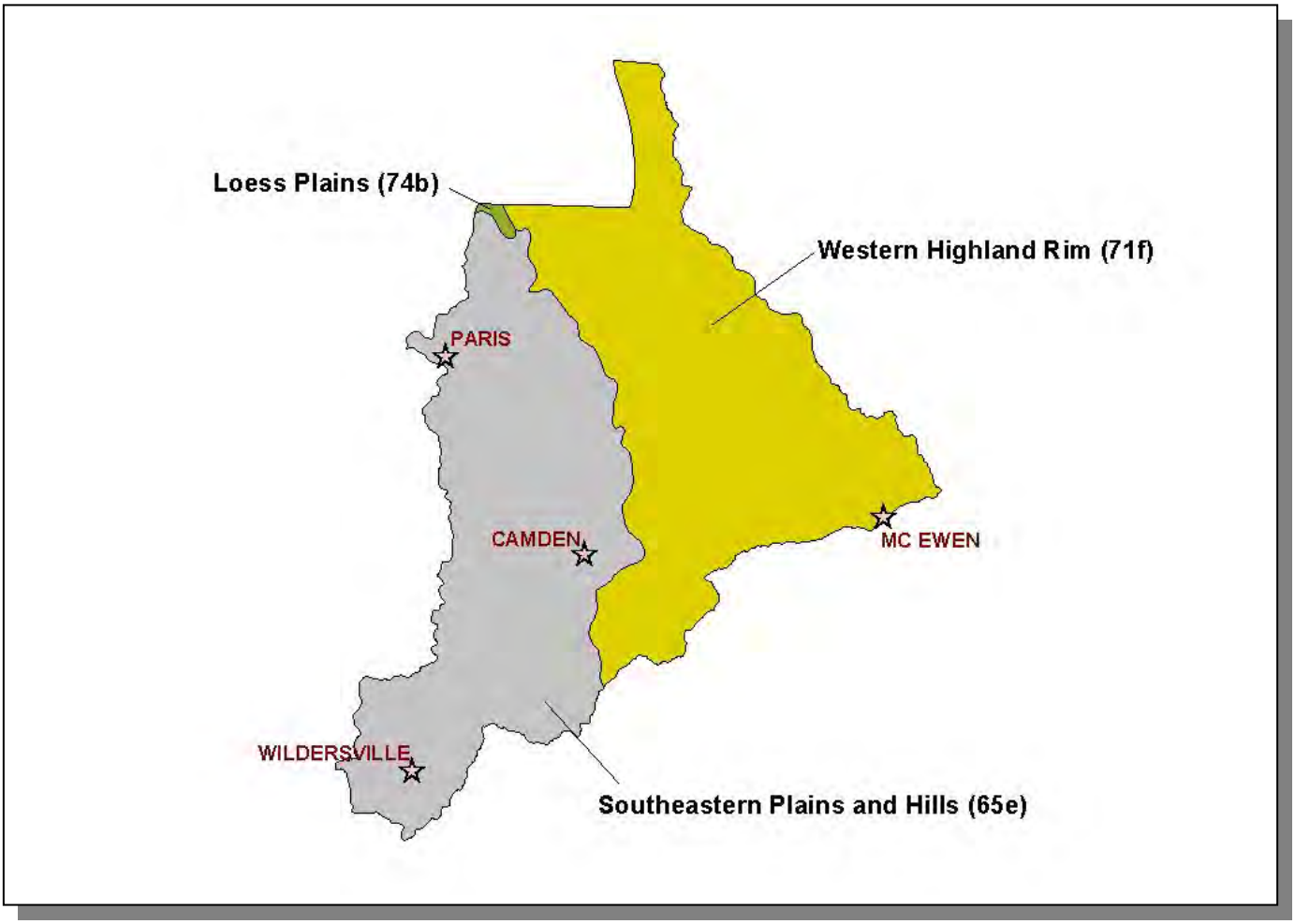


Figure 2-9. Level IV Ecoregions in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Locations of Camden, McEwen, Paris, and Wildersville are shown for reference.*

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.

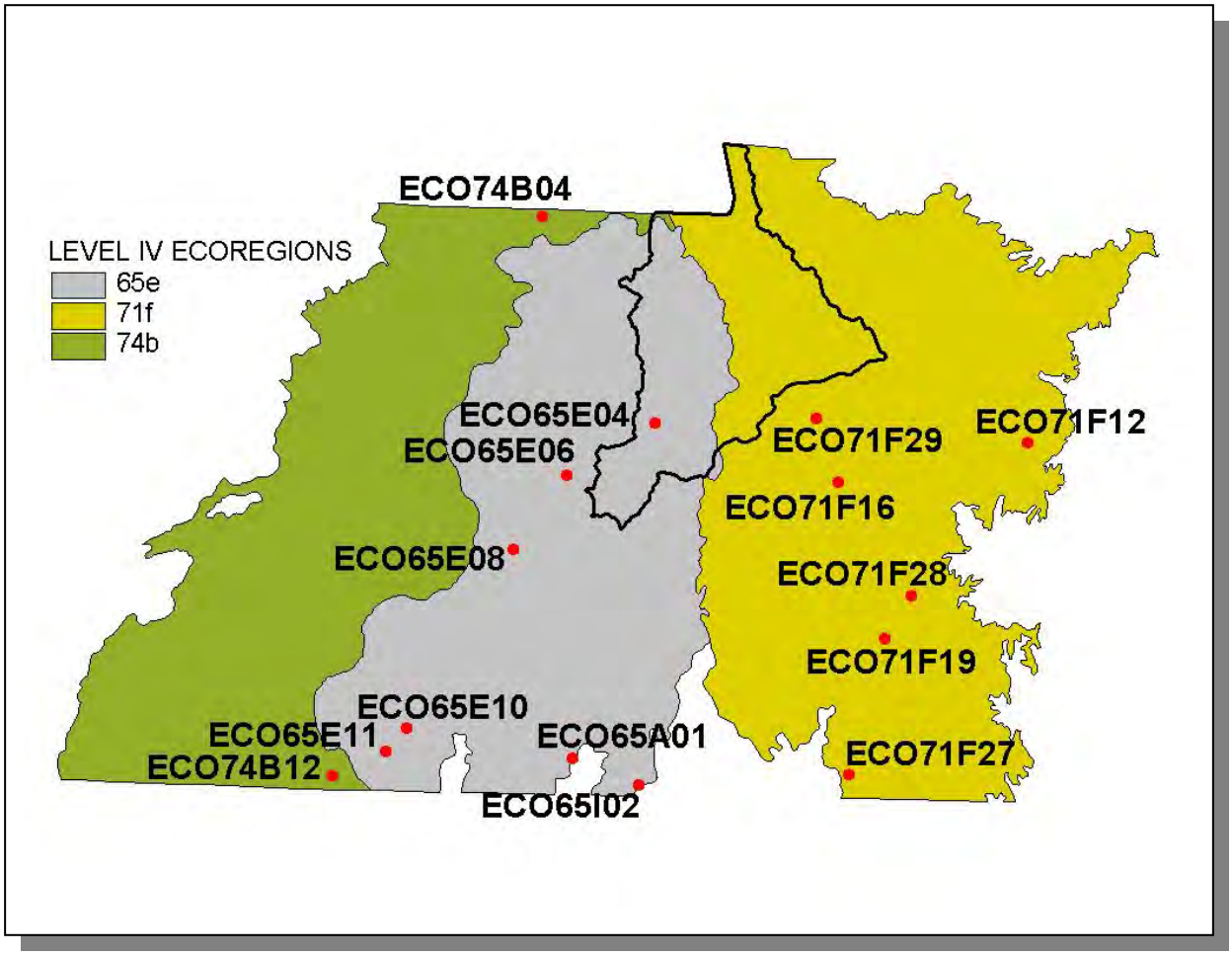


Figure 2-10. Ecoregion Monitoring Sites in Level IV Ecoregions 65e, 71f, and 74b in Tennessee. *The Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed boundary is shown for reference. More information is provided in Appendix II.*

2.6. NATURAL RESOURCES.

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

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	1
Insects and Spiders	1
Mussels	4
Amphibians	1
Birds	7
Fish	4
Mammals	3
Reptiles	4
Plants	23
Total	**48**

Table 2-3. There are 48 Known Rare Plant and Animal Species in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.

In the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed, there are 4 rare fish species, 1 rare crustacean species, and 4 rare mussel species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Ichthymyzon unicuspis	Silver Lamprey		D
Lepistosteus spatula	Alligator Gar		D
Percina burtoni	Blotchside Darter	MC	D
Percina phoxocephala	Slenderhead Darter		D
Orconectes burri	A Crayfish		
Lampsilis abrupta	Pink Mucket	LE	E
Obovaria retusa	Ring Pink	LE	E
Plethobasus cooperianus	Orange-Footed Pimpleback	LE	E
Pleurobema plenum	Rough Pigtoe	LE	E

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service, MC, Management Concern for 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. More information may be found at http://www.state.tn.us/environment/nh/data.php.*

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/nh/wetlands/

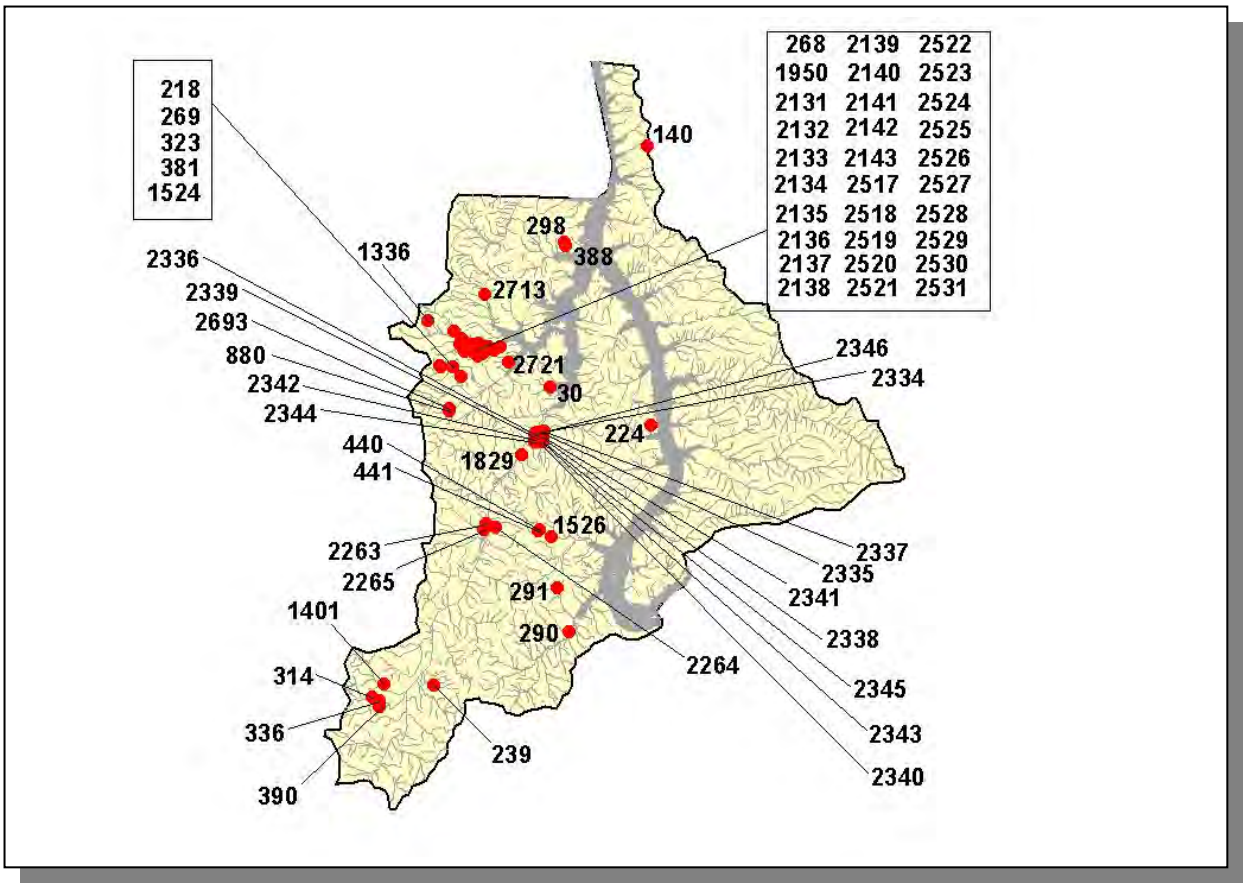


Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands*. More information is provided in Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Greenways. The Tennessee Western Valley (KY Lake) Watershed has at least three greenways/trails:

- Asbury Park Walking Train in Waverly
- Big sandy walking Trail
- Paris Civic center Trail

More information about greenways and trails in the watershed may be found at:

http://www2.state.tn.us/tdec/GREENWAYS/tnmap.htm

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

- Land Between the Lakes National Recreation Area was established in the early 1960's. The 170,000-acre property lies between Kentucky Lake on the west and Lake Barkley on the east. The site is managed by the U.S. Forest Service.
- Nathan Bedford Forrest State Park was named in honor of the greatest military tacticians and leaders of the confederate army. The park was dedicated in 1924 on land acquired, in part, from Benton County. The site is managed by the state of Tennessee.
- Paris Landing State Park is named for a steamboat and freight landing on the Tennessee River that was active in the early 1800's. The 841-acre park is on the western shore of Kentucky Lake. The site is managed by the state of Tennessee.
- Johnsonville State Historic Area is named for Military Governor (and later President) Andrew Johnson. The 600-acre park is located on the eastern shore of Kentucky Lake. The site is managed by the state of Tennessee.
- Tennessee NWR-Duck River and Big Sandy Units, established in 1945, is managed by the U.S. Fish and Wildlife Service as an important resting and feeding area for wintering waterfowl as well as migratory birds and resident wildlife. The sites are managed by the U.S. Fish and Wildlife Service.
- Natchez Trace State Park and Forest was named for the famous Nashville to Natchez Highway, an important wilderness road of the late 18th and early 19th centuries. The sites are managed by the state of Tennessee.

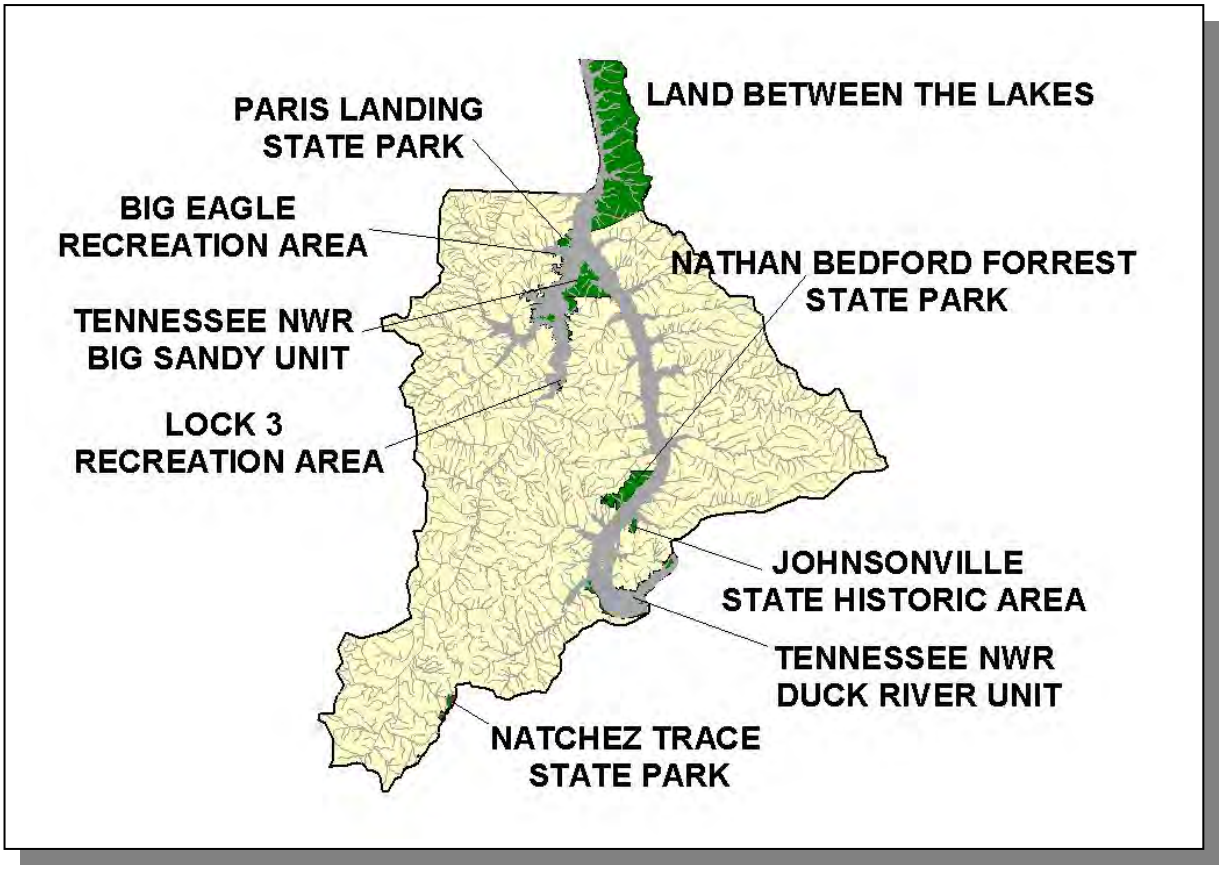


Figure 2-12. Locations of State- and Federally-Managed Lands in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.

2.7.C. Wildlife Management Area. The Tennessee Wildlife Resources Agency manages eight wildlife management areas in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.

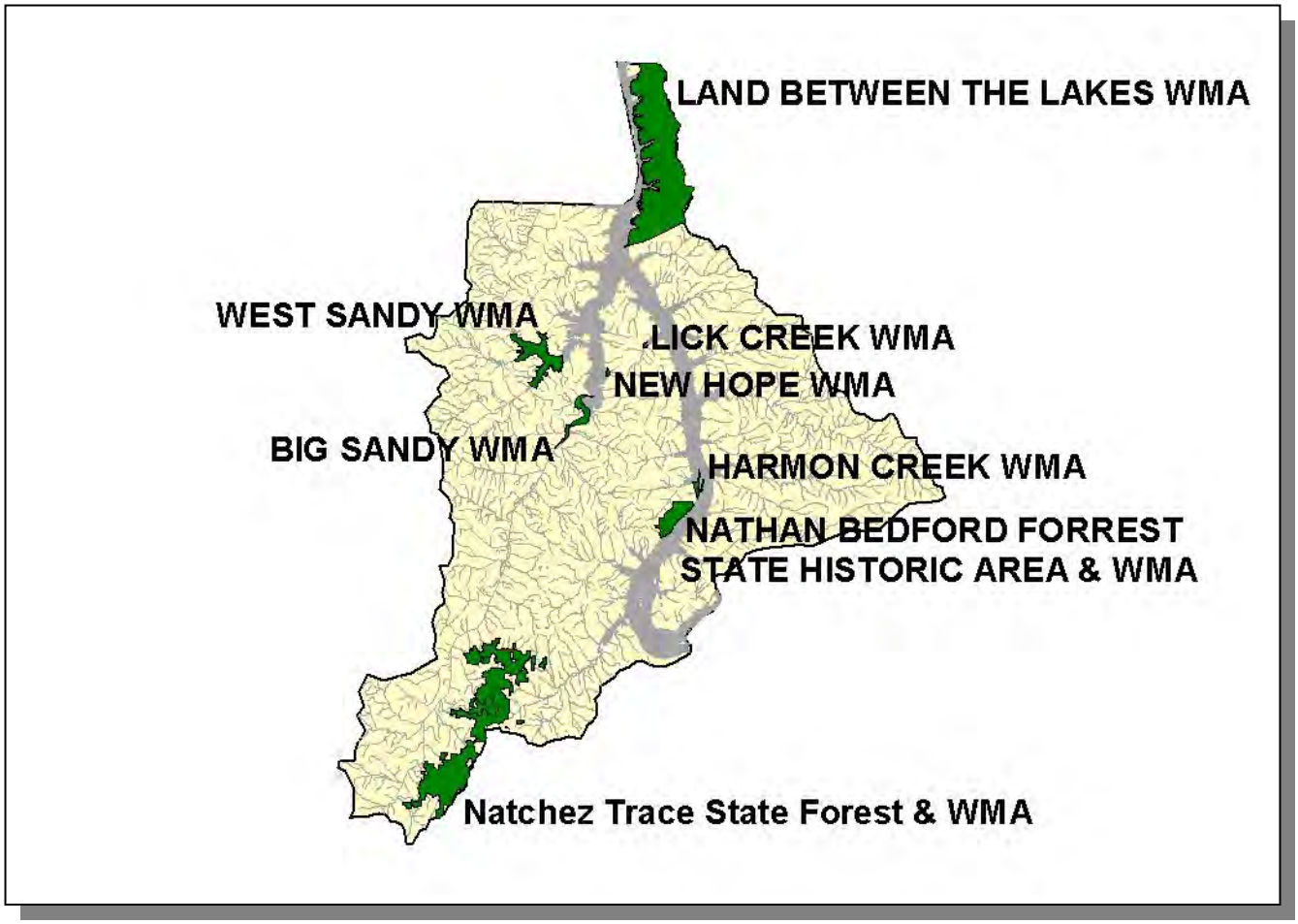


Figure 2-13. TWRA Manages Wildlife Management Areas in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.

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
Allen Creek Canal	4				Jones Bend Creek	3		
Bacon Creek Canal	3				Little Birdsong Creek	3		
Bailey Fork Creek	3				Little Blue Creek	3		
Bear Creek Canal	4		2		Little Eagle Creek	2	2	
Beaverdam Creek (North)	4				Little Richland Creek	3	2	
Beaverdam Creek (South)	3		2		Lost Creek	1		
Big Beaver Creek	4				Maple Creek	3		
Big Richland Creek	2,3		4		Martin Creek	4		
Big Sandy River	3	2,3			North Fork Leatherwood Creek	2		
Birdsong Creek	2		1,2		North Fork Mud Creek	3		
Blood River	1	2	2		Panther Creek	1		
Cane Creek					Ramble Creek	3		2
Clifty Creek	4				Roan Creek Canal	3		
Cotton Creek	3				Rushing Creek Drainage Ditch	3		2
Crooked Creek					Scarce Creek	2		
Cypress Creek (North)	3				Seventeen Creek	3		
Cypress Creek (South)	4		2		South Creek	3		
Dabbs Creek	3				South Fork Hurricane Creek			2
Deer Creek	2				Standing Rock Creek	2		2
Dry Creek	3		2,3		Sycamore Creek	3		
Eagle Creek	1	2			Threemile Branch Town Creek	3		
East Fork Leatherwood Creek	2		2		Trace Creek	3	3	
Fourteen Creek	3				Turkey Creek	3		
Holly Fork Creek	3		2		West Sandy Creek	2	3	
Horn Creek	3				White Oak Creek	3	3	2
Hurricane Creek	2		1					

Table 2-5. Stream Scoring from the Tennessee Rivers Assessment Project in the Tennessee Western Valley (KY Lake) Watershed.

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

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

CHAPTER 3

WATER QUALITY ASSESSMENT OF THE TENNESSEE WESTERN VALLEY (KY LAKE) 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 fail to support some or all of their classified uses. The 303(d) list does not include streams determined to be fully supporting designated uses 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/2004_303dlist.pdf

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

This chapter provides a summary of water quality in the Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed, summarizes data collection and assessment results, and describes impaired waters.

3.2. DATA COLLECTION. Comprehensive water quality monitoring in the Tennessee Western Valley (KY Lake) Watershed was conducted in 1999-2000. Data are from one of four site types: (1) Ambient sites, (2) Ecoregion sites, (3) Watershed sites, or (4) Tier Evaluation sites.

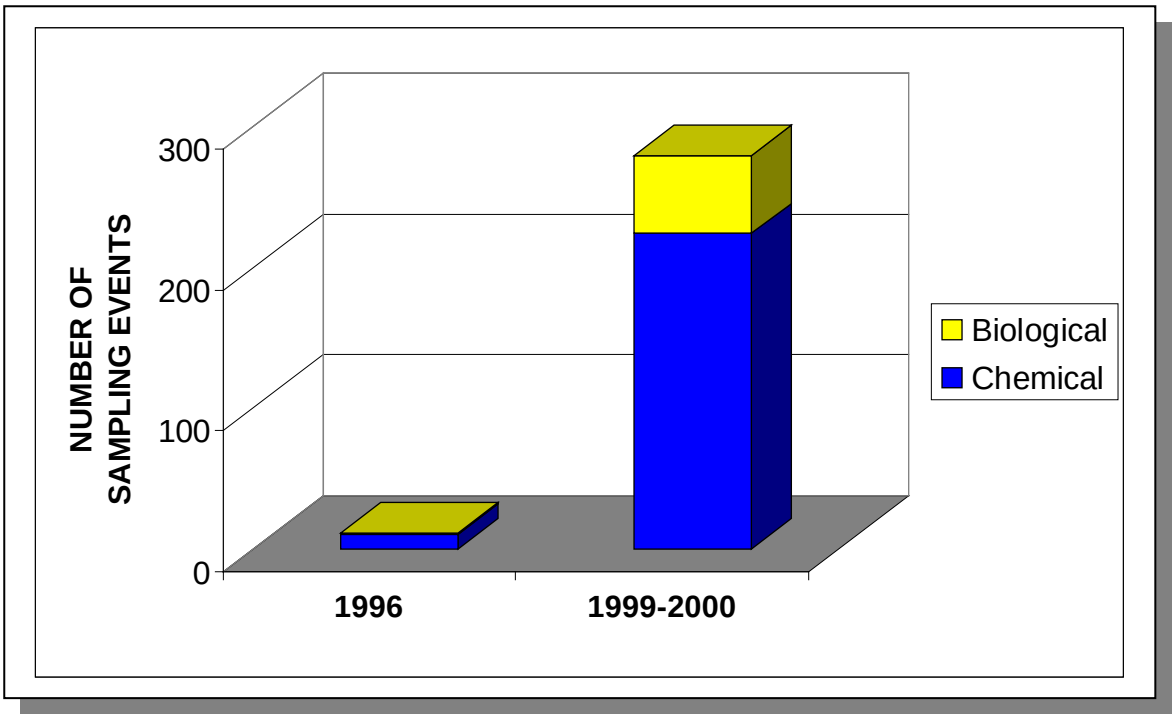


Figure 3-1. Number of Sampling Events Using the Traditional Approach (1996) and Watershed Approach (1999-2000) in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.

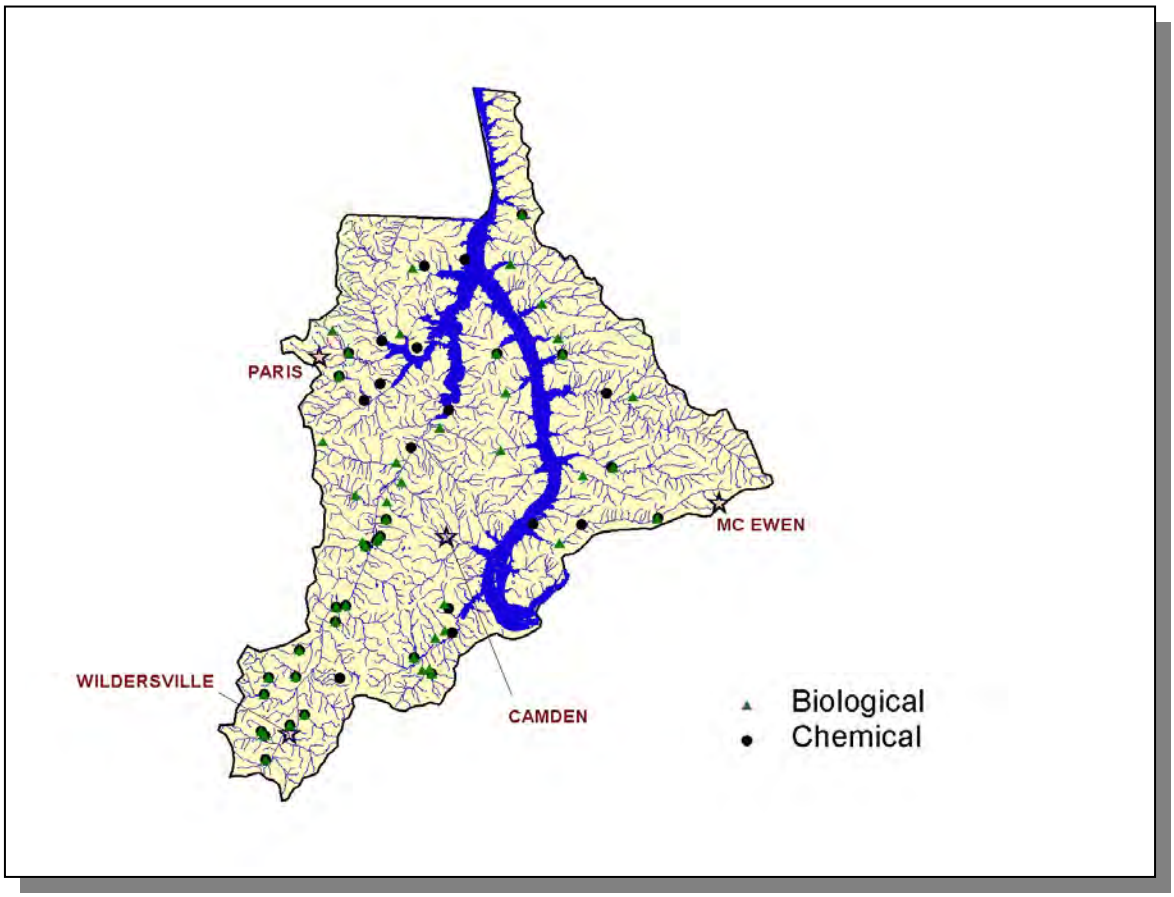


Figure 3-2. Location of Monitoring Sites in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Locations of Camden, McEwen, Paris, and Wildersville are shown for reference.*

	1996	1999-2000
Biological	1	55
Chemical	10	224
Total	**11**	**279**

Table 3-1. Number of Sampling Events in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed During the Data Collection Phase of the Watershed Approach.

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

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

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

- Southeastern Plains and Hills (65e)
- Western Highland Rim (71f)
- 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 during the watershed sampling time period.

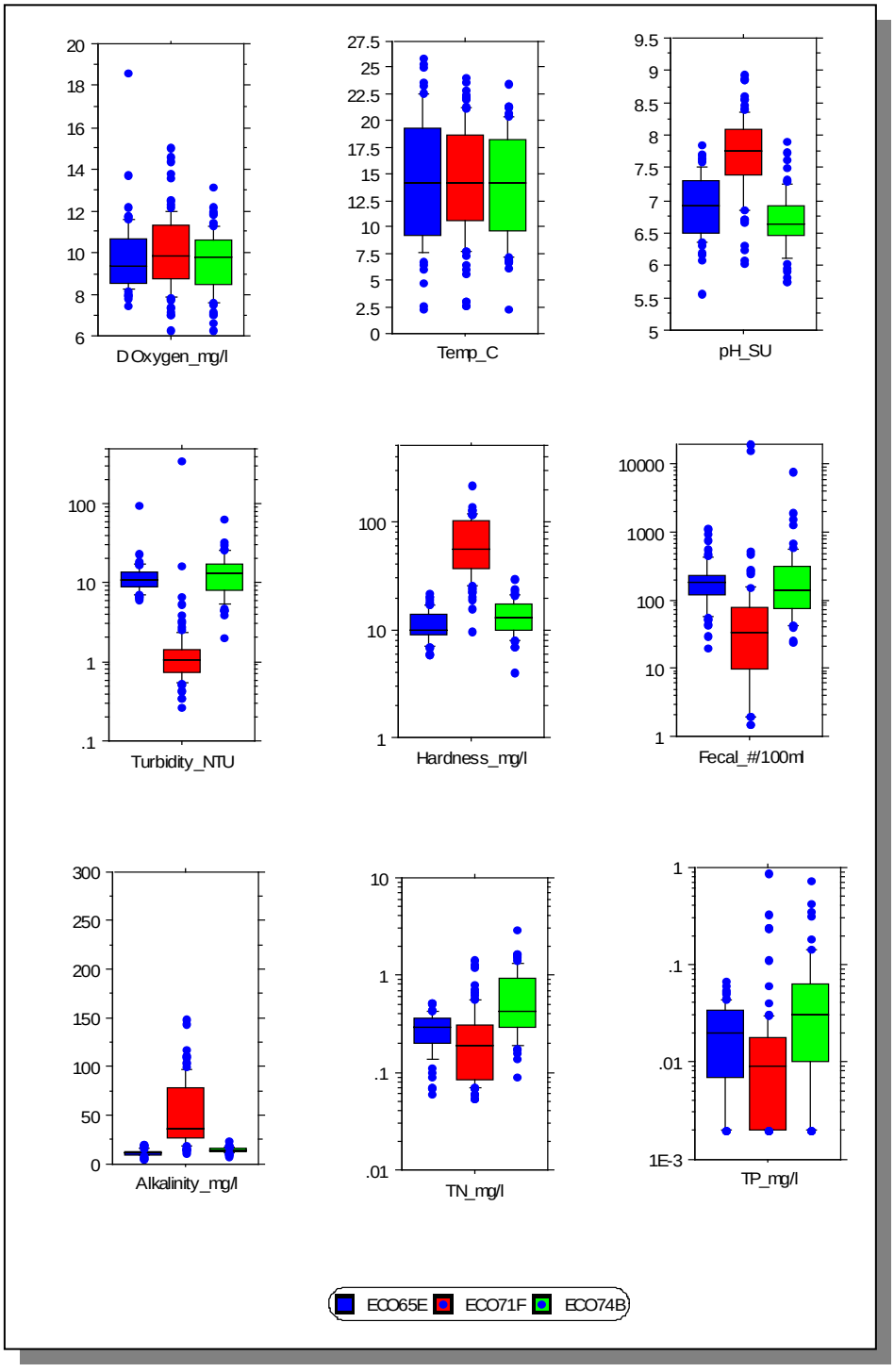


Figure 3-3. Select Chemical Data Collected in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th,*

median, 75th, and 90th percentiles. Extreme values are also shown as dots. Fecal, fecal coliform bacteria; TN, Total Nitrogen; TP, Total Phosphorus.

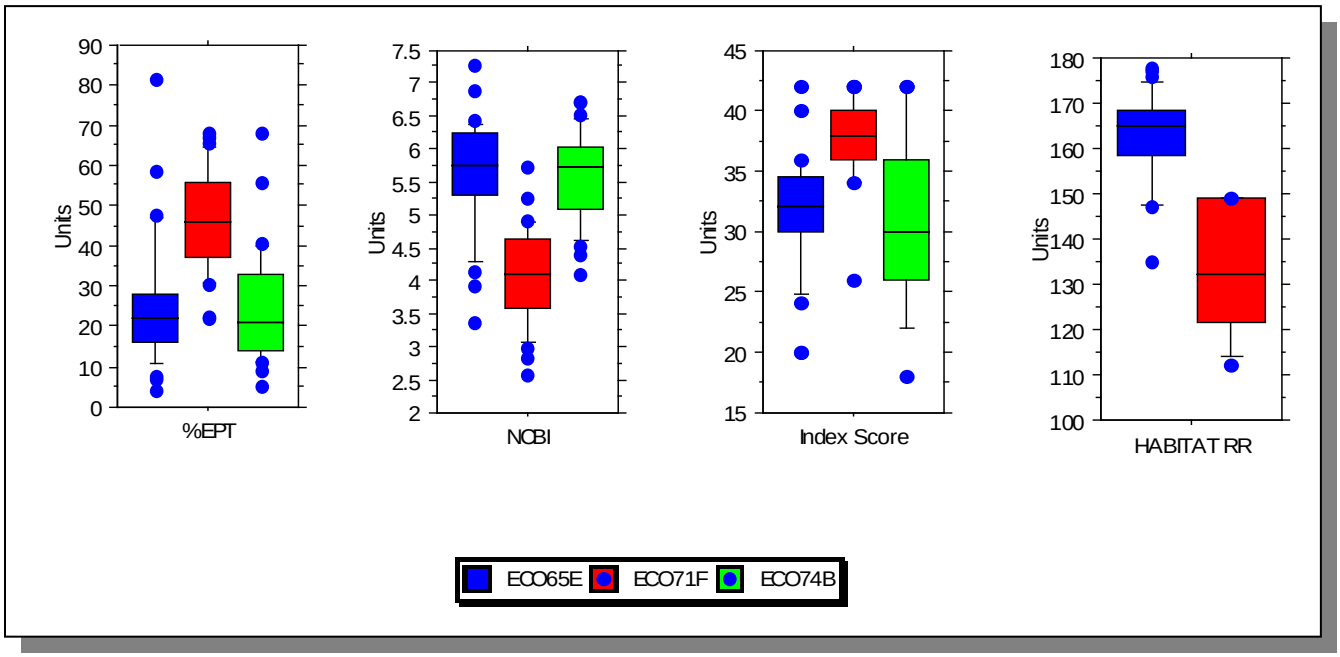


Figure 3-4. Benthic Macroinvertebrate and Habitat Scores for the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th, median, 75th, and 90th percentiles. Extreme values are also shown as dots. NCBI, North Carolina Biotic Index. Index Score and Habitat Riffle/Run scoring system are described in TDEC's Quality System Standard Operating Procedure for Macroinvertebrate 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 Field Offices, Tennessee Department of Health (Aquatic Biology Section of Laboratory Services), Tennessee Wildlife Resources Agency, National Park Service, Tennessee Valley Authority, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Geological Survey, U.S. Forest Service, universities and colleges, the regulated community, and the private sector.

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

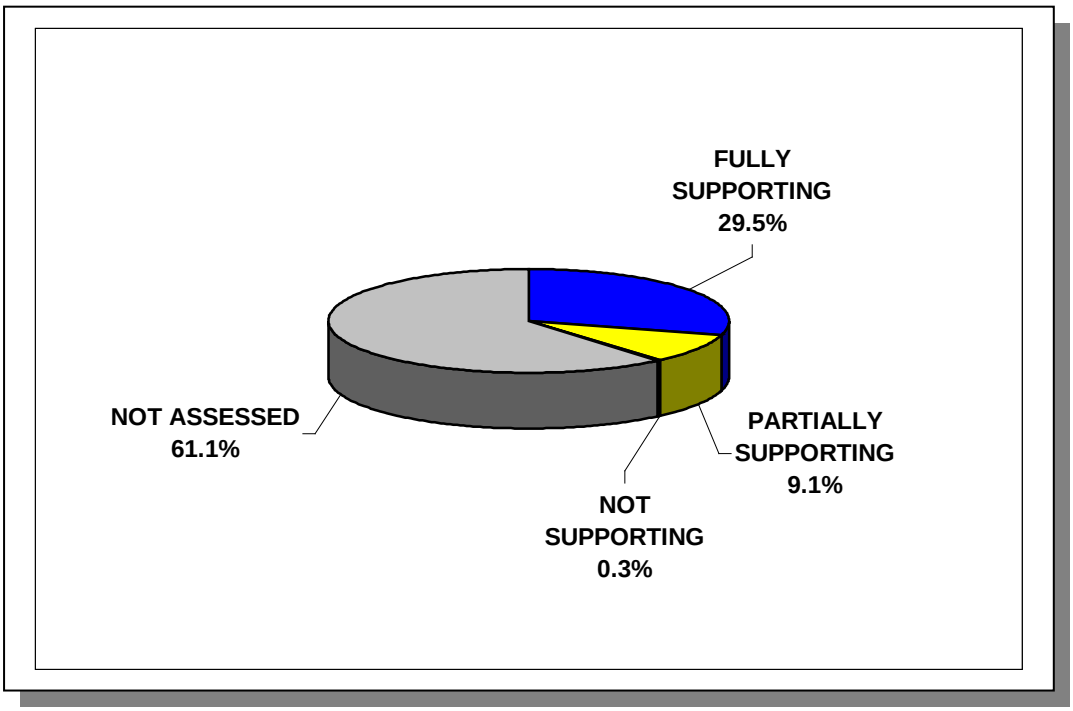


Figure 3-5a. Water Quality Assessment of Streams and Rivers in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment of 2,042.6 miles in the watershed. More information is provided in Appendix III.*

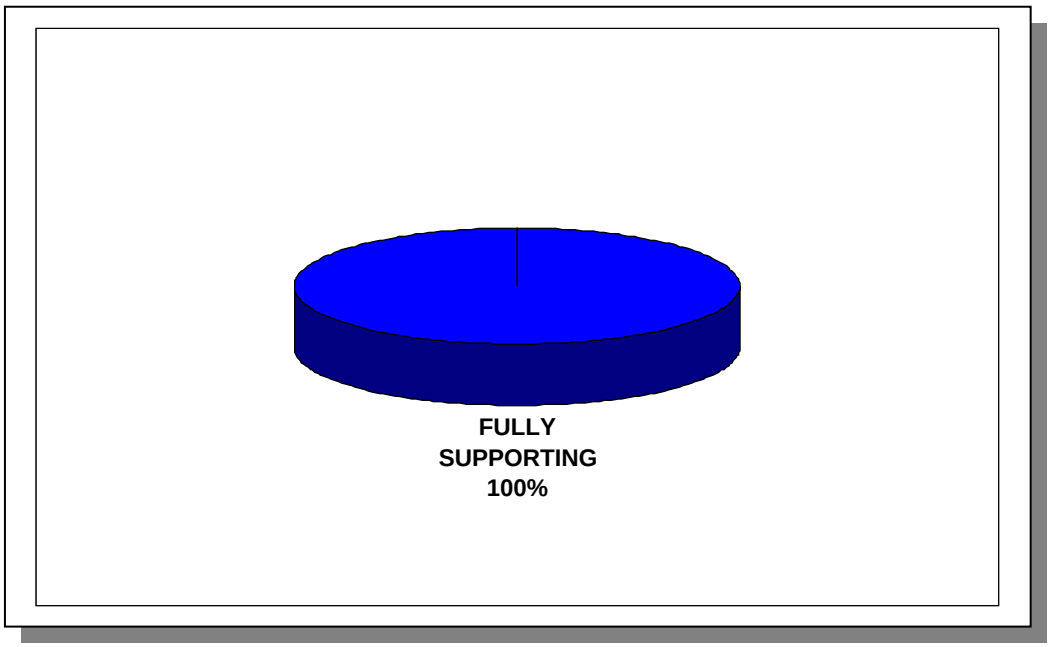


Figure 3-5b. Water Quality Assessment of Lakes in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment of 100,000 lake acres in the watershed. More information is provided in Appendix III.*

3.3.A. Assessment Summary.

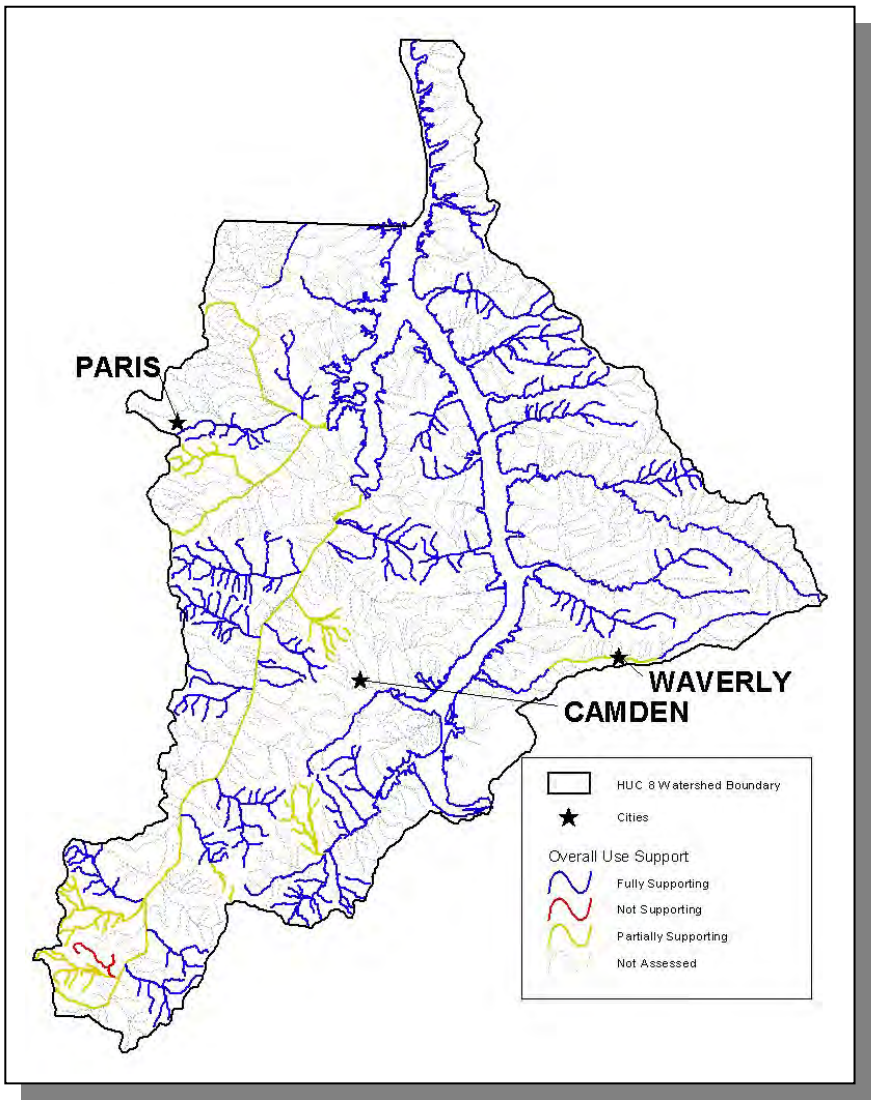


Figure 3-6a. Overall Use Support Attainment in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.*

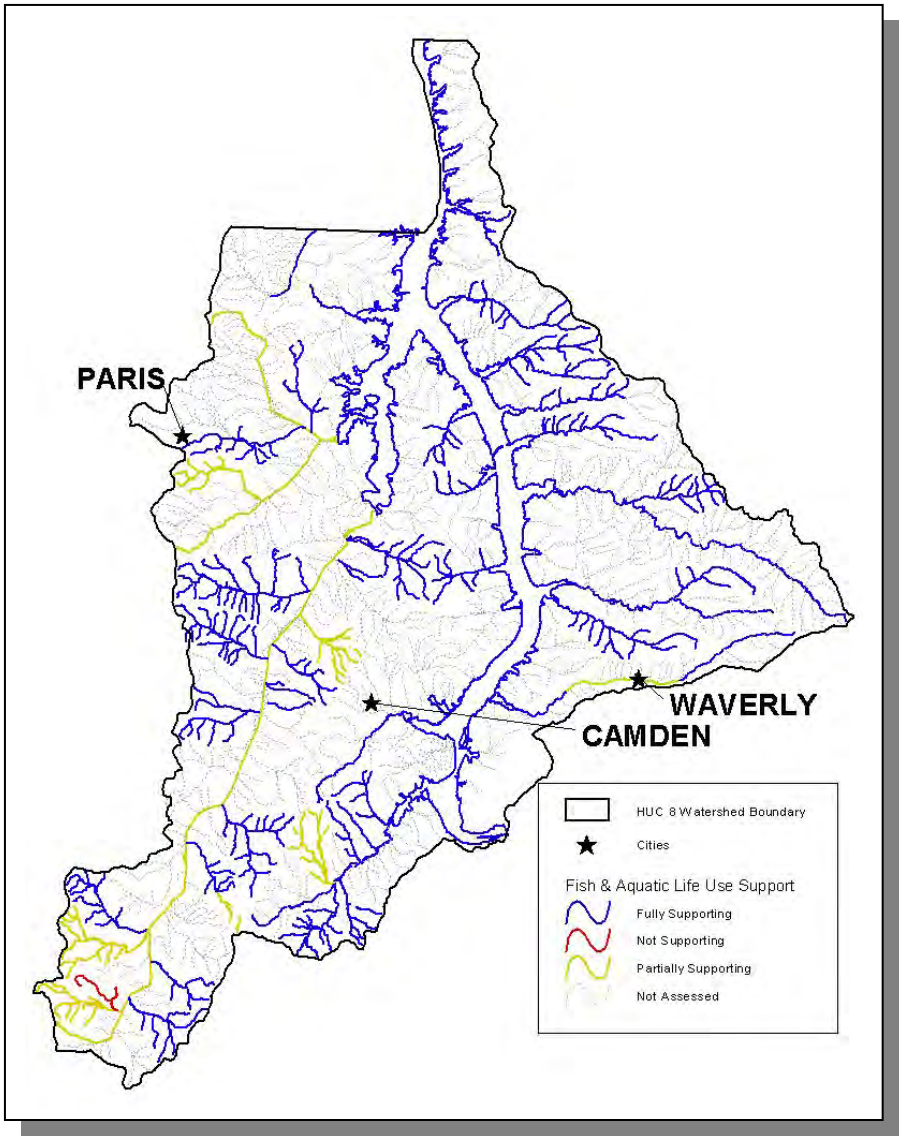


Figure 3-6b. Fish and Aquatic Life Use Support Attainment in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.*

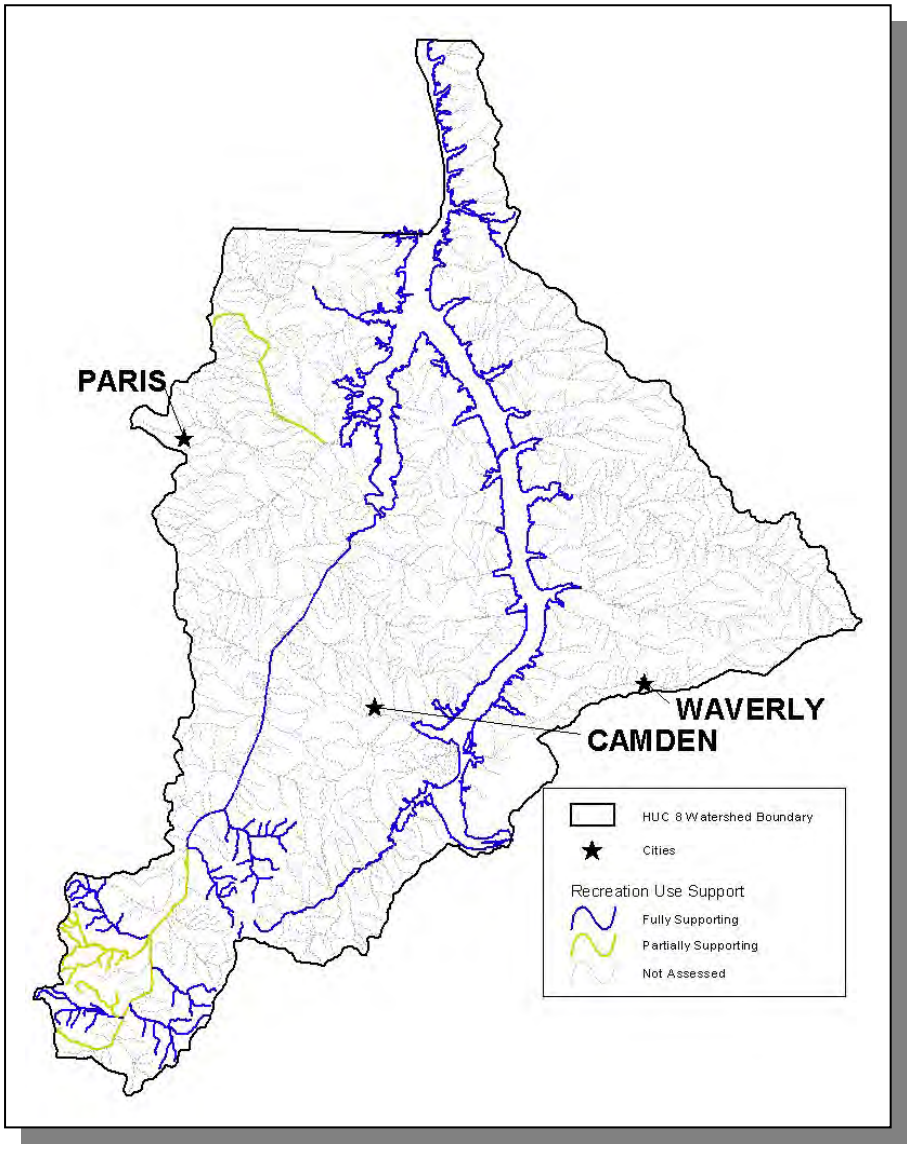


Figure 3-6c. Recreation Use Support Attainment in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.*

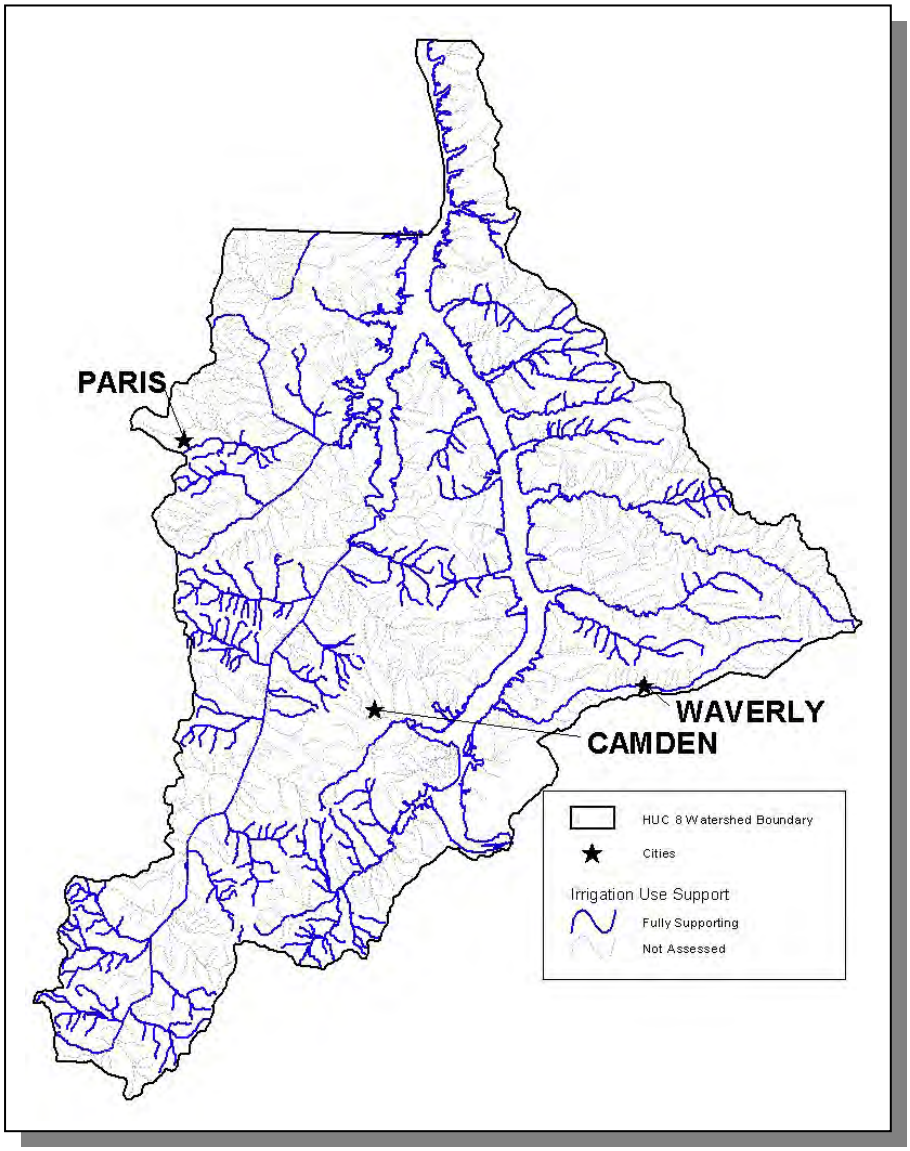


Figure 3-6d. Irrigation Use Support Attainment in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.*

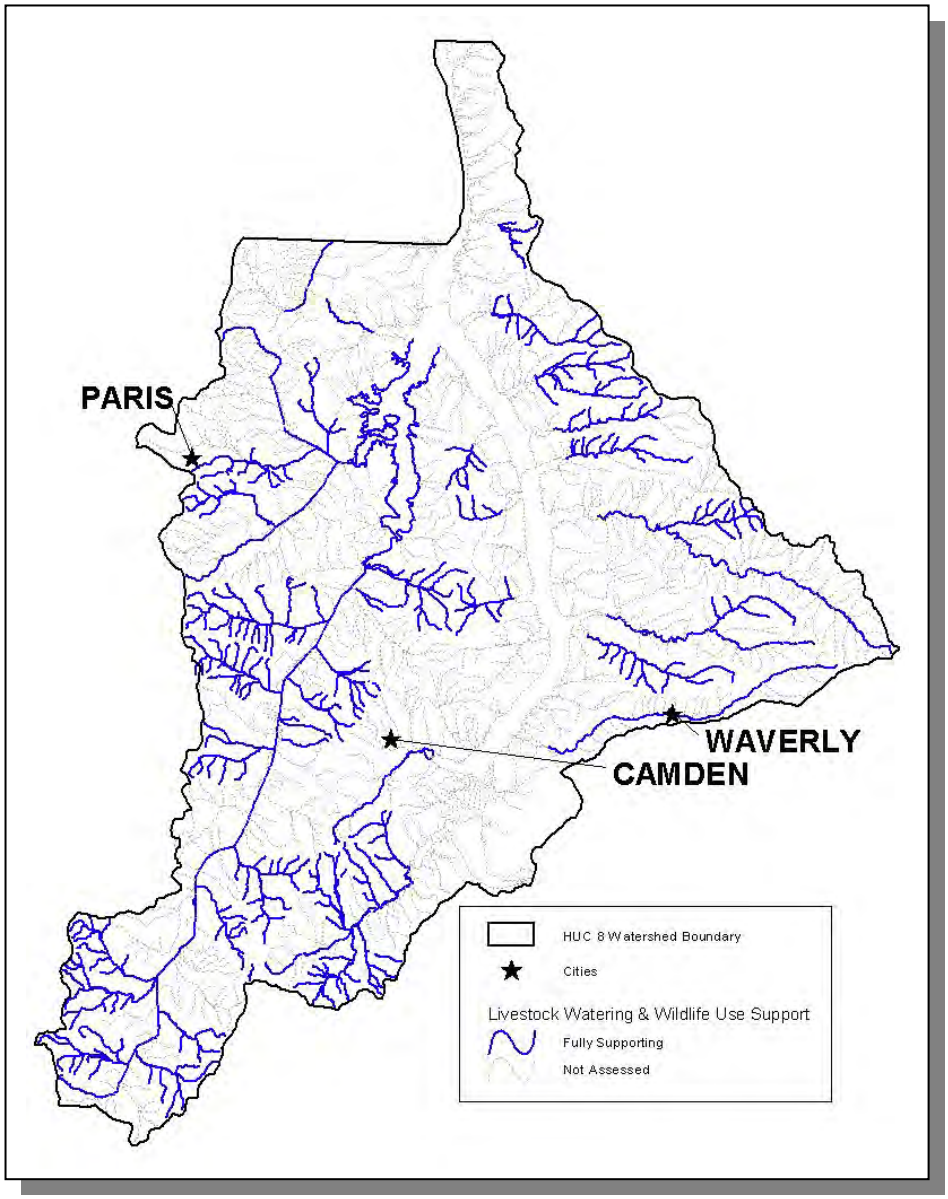


Figure 3-6e. Livestock Watering and Wildlife Use Support Attainment in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.*

3.3.B. Use Impairment Summary.

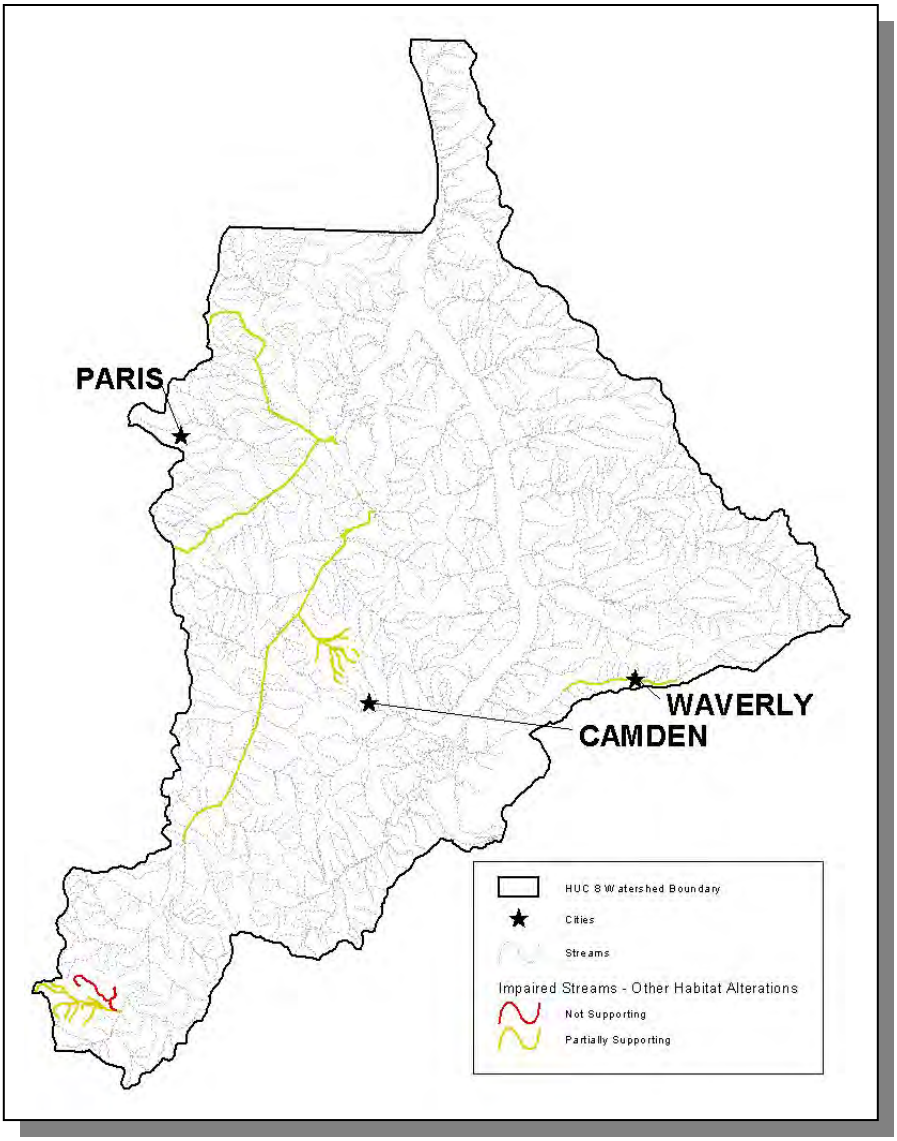


Figure 3-7a. Impaired Streams Due to Habitat Alteration in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002*

Water Quality Assessment. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.

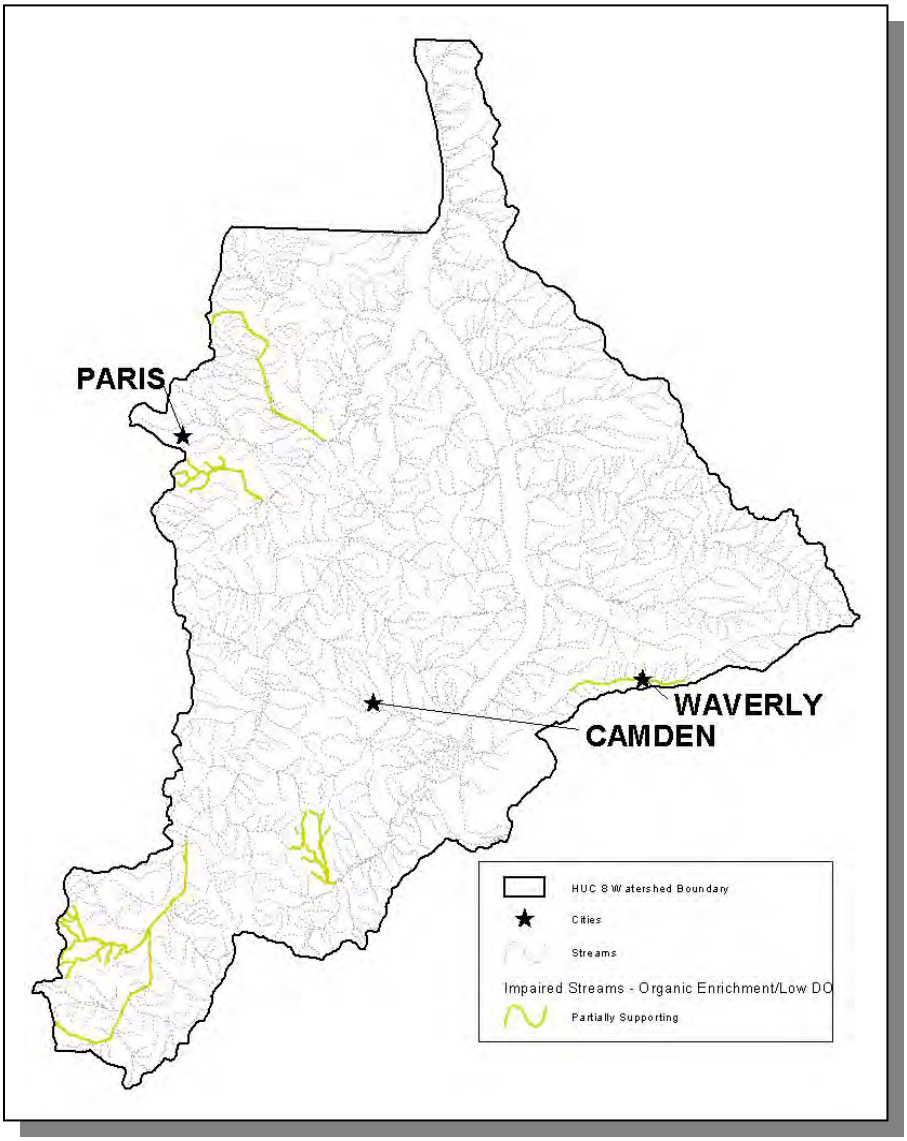


Figure 3-7b. Impaired Streams Due to Organic Enrichment or Low Dissolved Oxygen in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.*

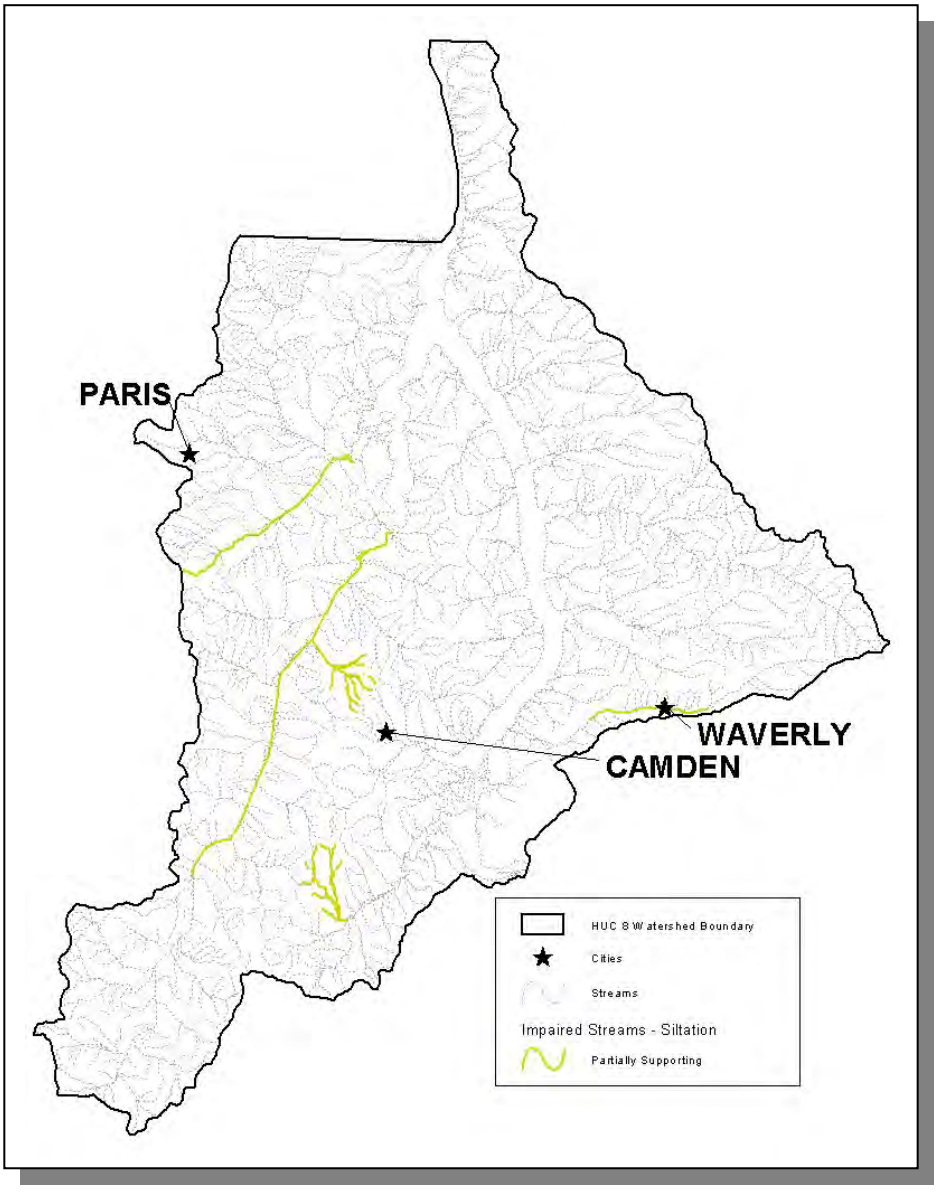


Figure 3-7c. Impaired Streams Due to Siltation in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality*

Assessment. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.

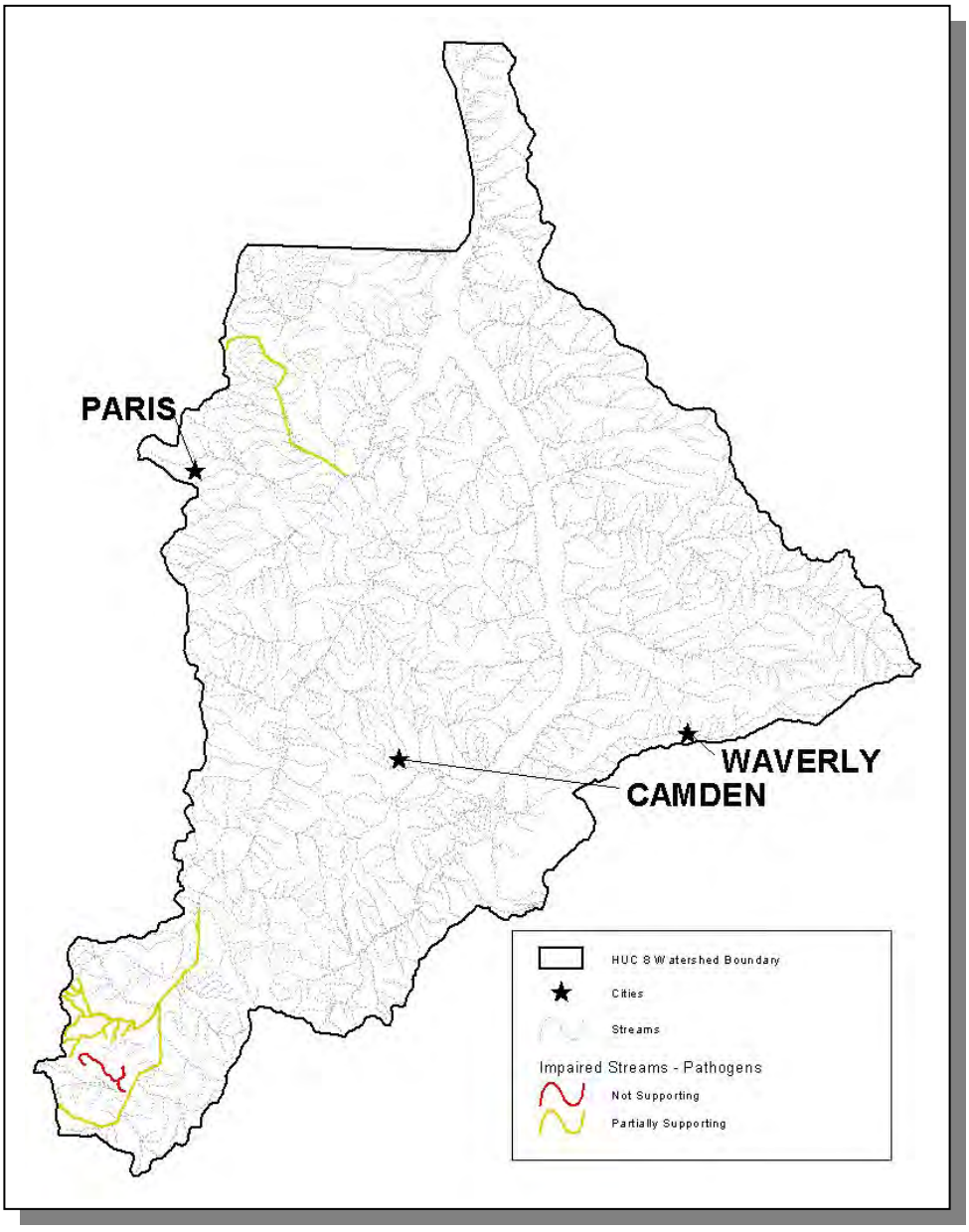


Figure 3-7d. Impaired Streams Due to Pathogens in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Assessment data are based on the 2002 Water Quality Assessment. Locations of Camden, Paris, and Waverly are shown for reference. More information is provided in Appendix III.*

The listing of impaired waters that do not support designated uses (the 303(d) list) is traditionally submitted to EPA every two years. A copy of the most recent 303(d) list may be downloaded from: http://www.state.tn.us/environment/water.htm.

Since the year 2002, the 303(d) list is 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,

CHAPTER 4

POINT AND NONPOINT SOURCE CHARACTERIZATION OF THE TENNESSEE WESTERN VALLEY (KY LAKE) 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 2002 303(d) list
iii. Description of nonpoint source contributions

The Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed (HUC 06040005) has been delineated into eight 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 2.0 (developed by Tetra Tech, Inc for EPA Region 4) released in 2003.

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

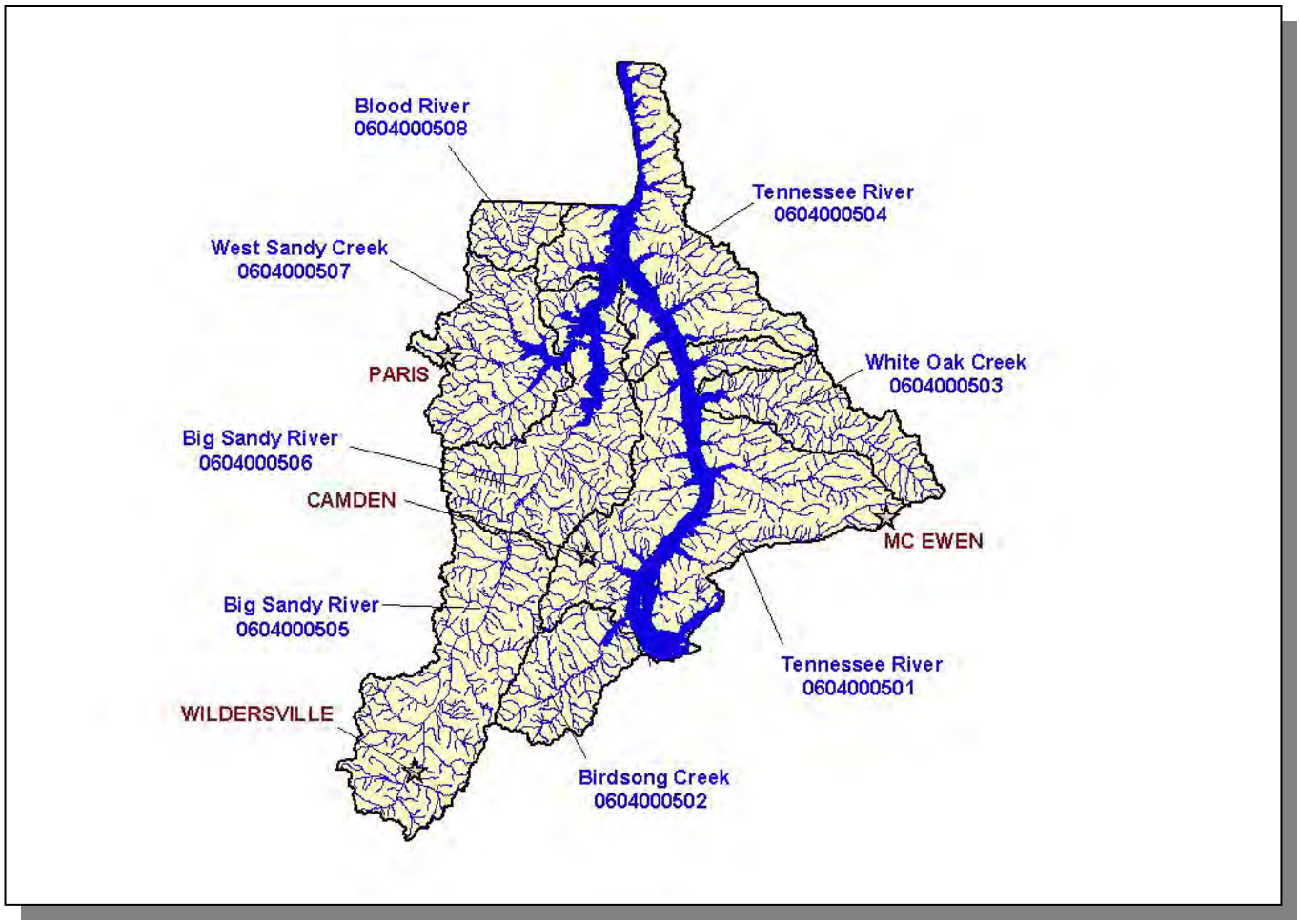


Figure 4-1. The Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed is Composed of Eight USGS-Delineated Subwatersheds (10-Digit Subwatersheds). *Locations of Camden, McEwen, Paris, and Wildersville are shown for reference.*

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 Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed.

HUC-10	HUC-12	
0604000501	060400050101 (Tennessee River)	060400050106 (Big Richland Creek)
	060400050102 (Cypress Creek)	060400050107 (Tennessee River)
	060400050103 (Tennessee River)	060400050108 (Turkey Creek)
	060400050104 (Trace Creek)	060400050109 (Cane Creek)
	060400050105 (Little Richland Creek)	
0604000502	060400050201 (Birdsong Creek)	060400050202 (Birdsong Creek)
0604000503	060400050301 (Upper White Oak Creek)	060400050302 (Lower White Oak Creek)
0604000504	060400050401 (Kentucky Lake)	060400050405 (Eagle Creek)
	060400050402 (Hurricane Creek)	060400050406 (Kentucky Lake)
	060400050403 (Leatherwood Creek)	060400050407 (Kentucky Lake)
	060400050404 (Standing Rock Creek)	
0604000505	060400050501 (Big Sandy River)	060400050504 (Big Sandy River)
	060400050502 (Big Sandy River)	060400050505 (Big Sandy River)
	060400050503 (Big Sandy River)	
0604000506	060400050601 (Martin Creek)	060400050603 (Big Sandy River)
	060400050602 (Big Sandy River)	060400050604 (Big Sandy River Outlet)
0604000507	060400050701 (West sandy Creek)	060400050703 (Bailey Fork Creek)
	060400050702 (West Sandy Dyke)	060400050704 (Holly Fork Creek)
0604000508	060400050801 (Blood River	

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. 0604000501 (Tennessee River).

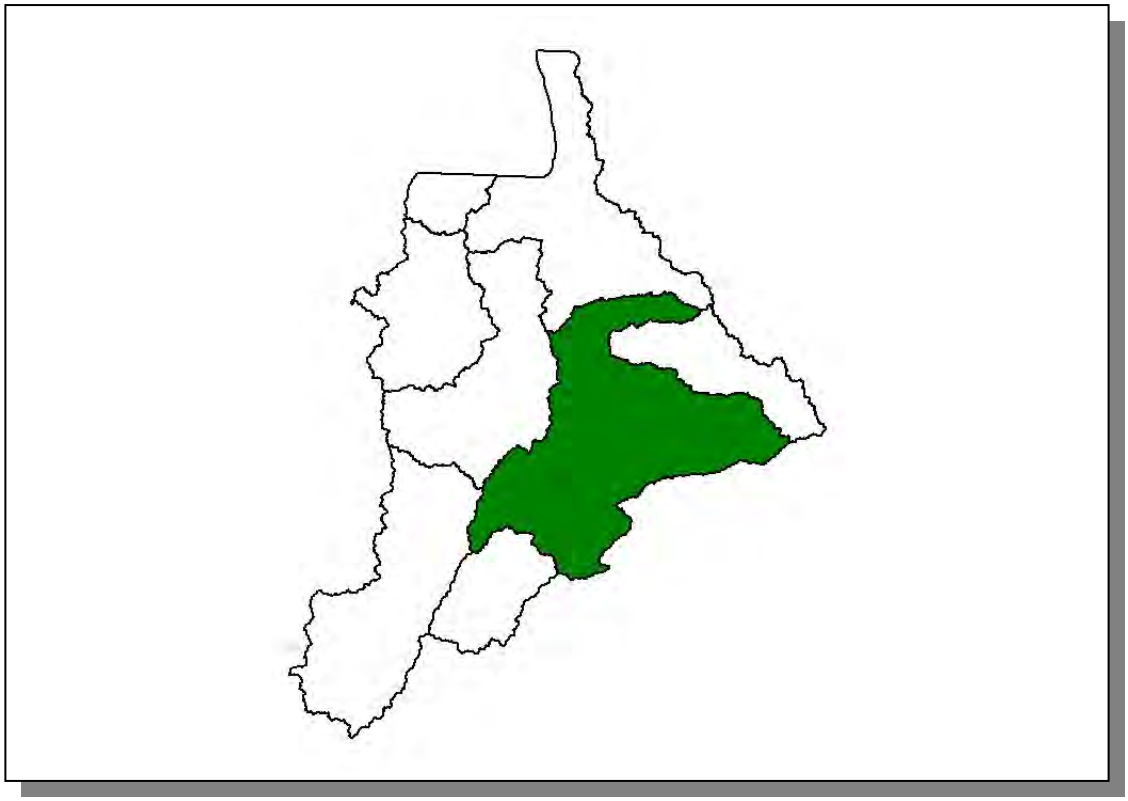


Figure 4-2. Location of Subwatershed 0604000501. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.A.i. General Description.

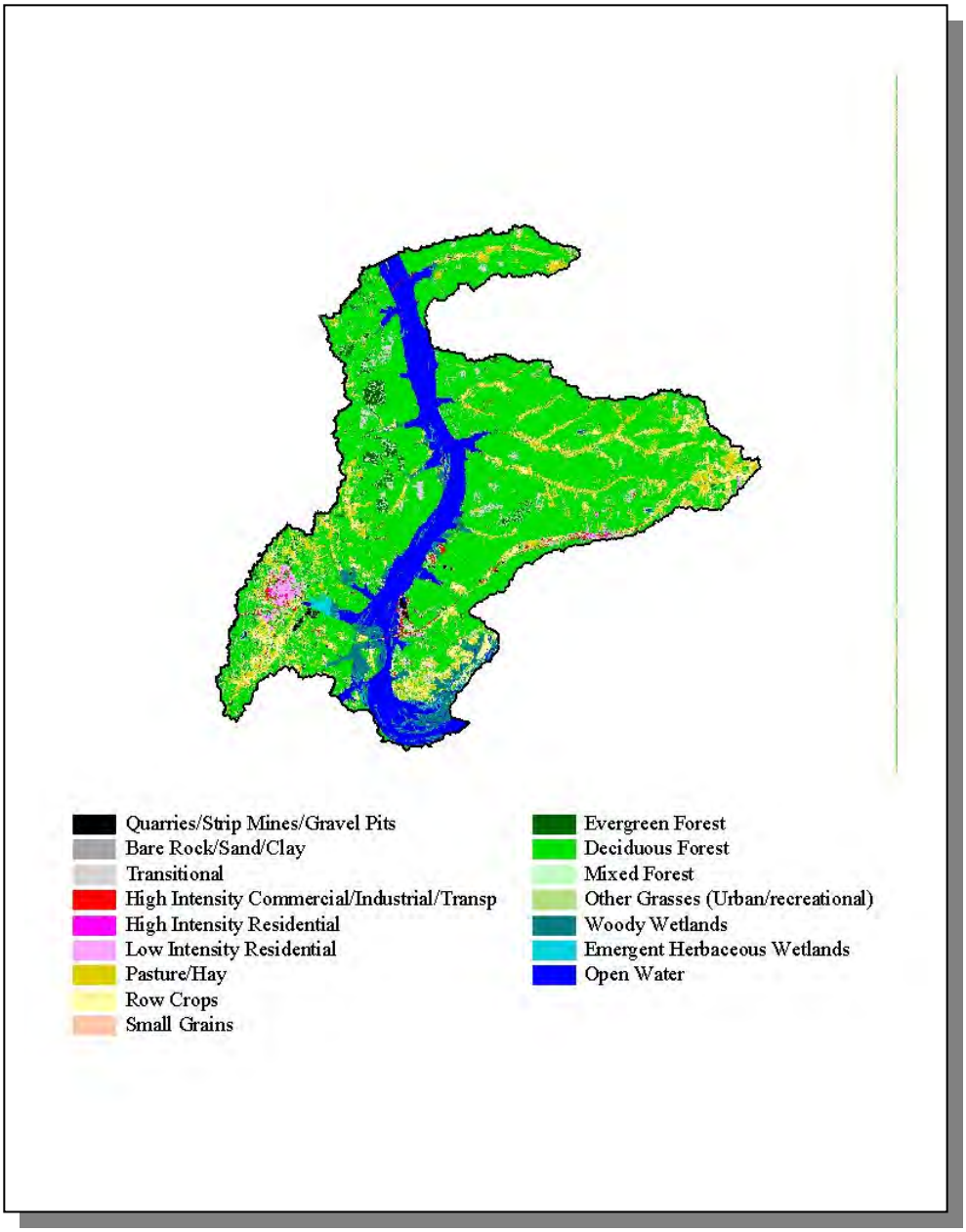


Figure 4-3. Illustration of Land Use Distribution in Subwatershed 0604000501.

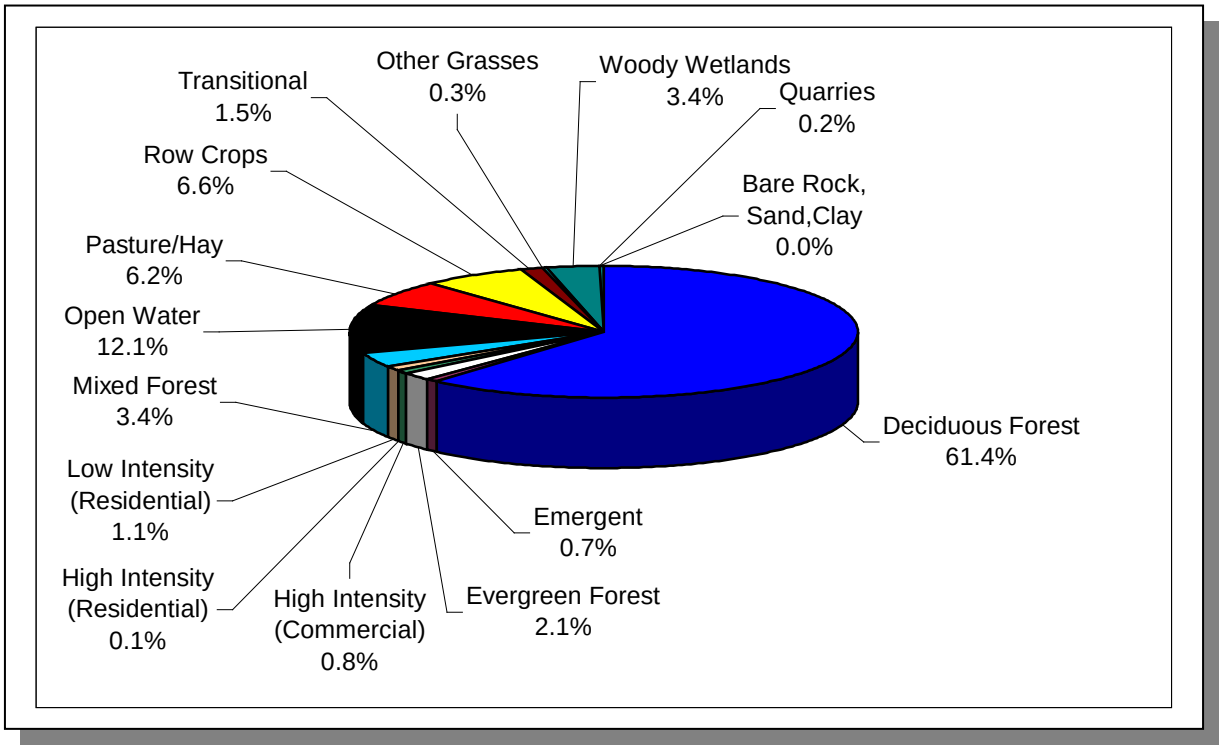


Figure 4-4. Land Use Distribution in Subwatershed 0604000501. *More information is provided in Appendix IV.*

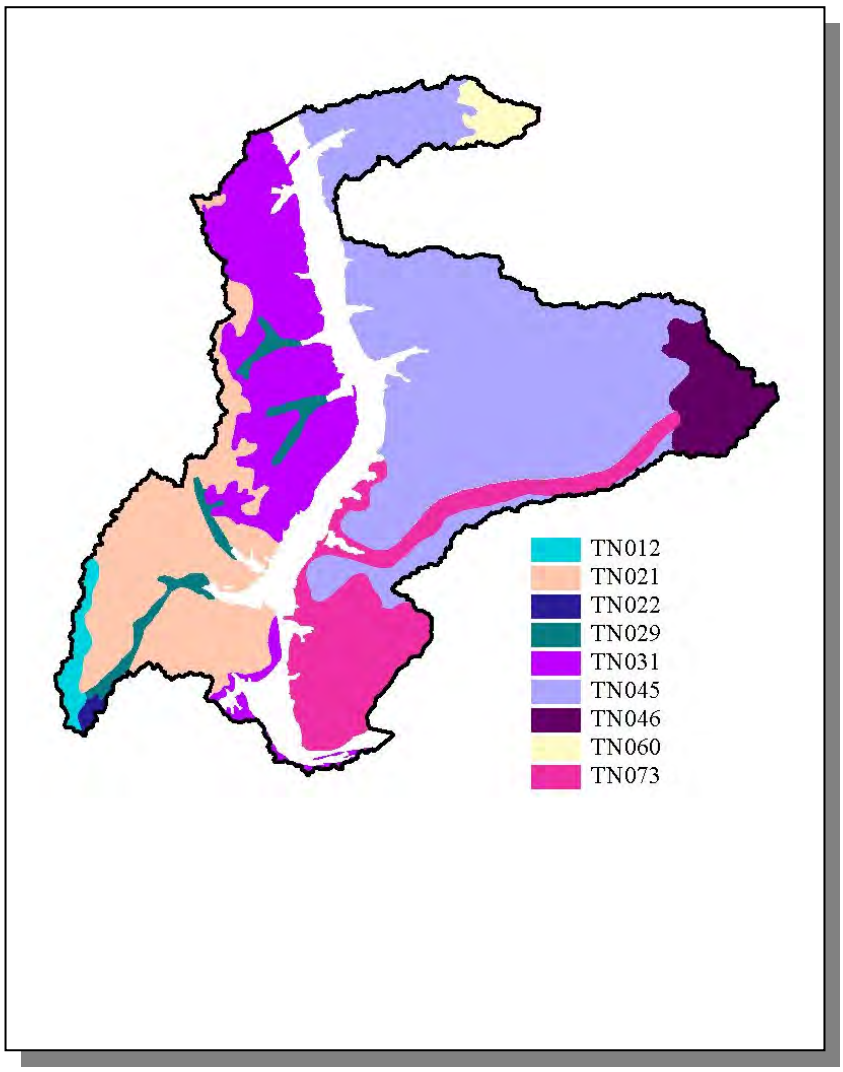


Figure 4-5. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000501.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN012	3.00	C	2.52	5.13	Silty Loam	0.39
TN021	15.00	C	1.30	5.00	Silty Loam	0.43
TN022	20.00	C	1.98	5.07	Loam	0.37
TN029	32.00	C	2.96	5.40	Loam	0.33
TN031	0.00	C	3.27	4.88	Loam	0.33
TN045	0.00	B	1.95	5.45	Loam	0.35
TN046	0.00	B	1.98	5.09	Silty Loam	0.38
TN060	20.00	B	1.30	5.32	Silty Loam	0.39
TN073	0.00	B	2.97	5.21	Loam	0.34

Table 4-2. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000501. *More details are provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Benton	14,524	16,243	16,537	37.24	5,408	6,049	6,158	13.9
Houston	7,018	7,769	8,088	14.32	1,005	1,113	1,159	15.3
Humphreys	15,795	16,839	17,929	35.56	5,616	5,987	6,375	13.5
Stewart	9,479	11,241	12,370	0.11	10	12	13	30.0
Totals	**46,816**	**52,092**	**54,924**		**12,039**	**13,161**	**13,705**	**13.8**

Table 4-3. Population Estimates in Subwatershed 0604000501.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Camden	Benton	3,643	1,667	1,422	245	0
McEwen	Humphreys	1,442	632	561	71	0
New Johnsonville	Humphreys	1,643	680	507	167	6
Tennessee Ridge	Houston	1,271	499	117	377	5
Waverly	Humphreys	3,925	1,787	1,471	304	12
Totals		**11,924**	**5,265**	**4,078**	**1,164**	**23**

Table 4-4. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0604000501.

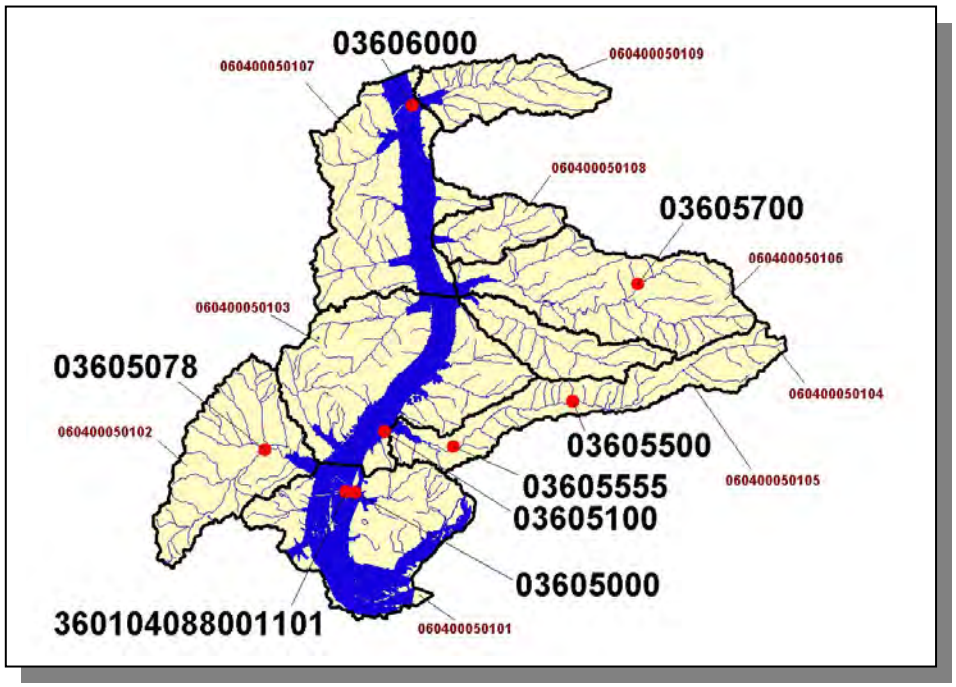


Figure 4-6. Location of Historical Streamflow Data Collection Sites in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information is provided in Appendix IV.*

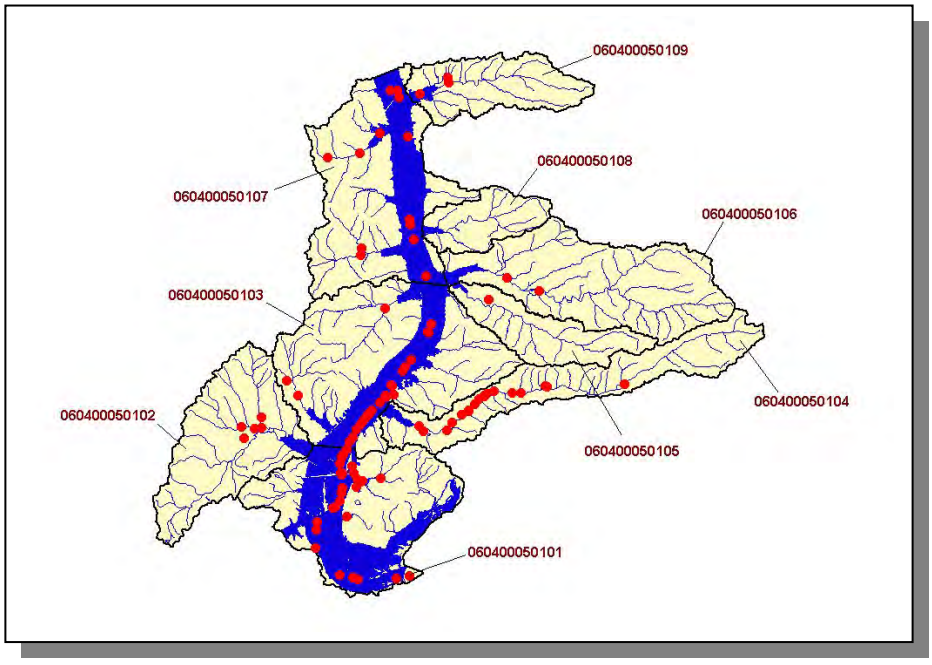


Figure 4-7. Location of STORET Monitoring Sites in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

4.2.A.ii Point Source Contributions.

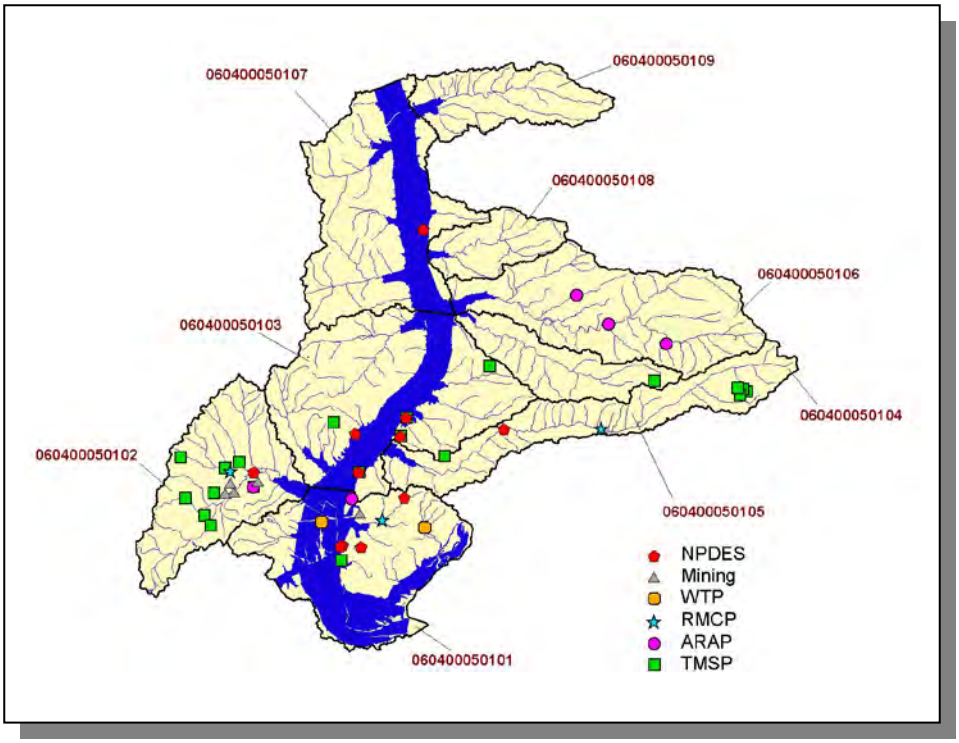


Figure 4-8. Location of Active Point Source Facilities in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

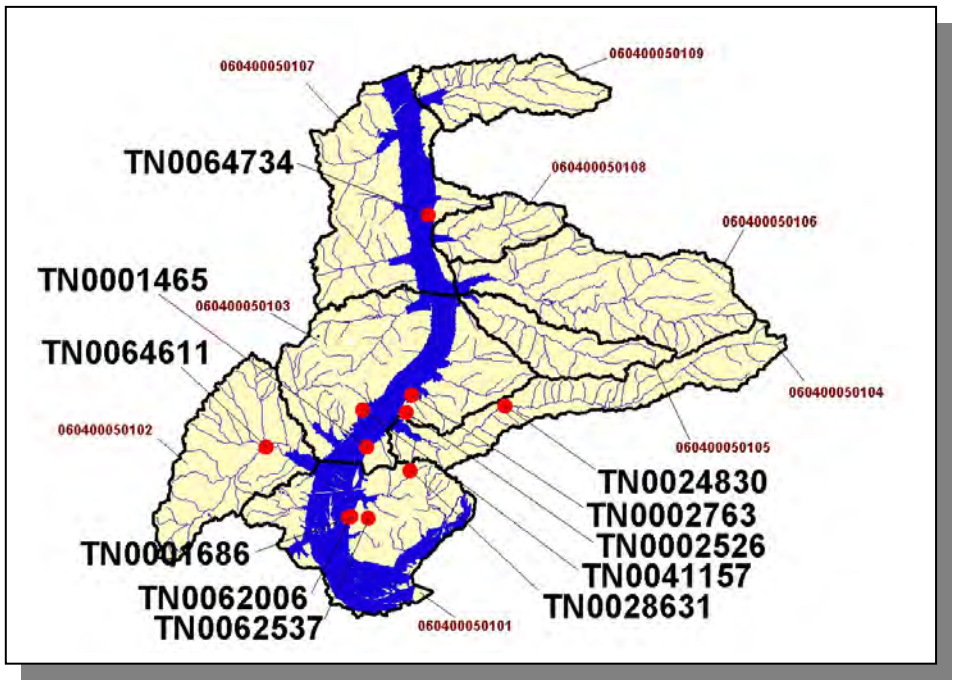


Figure 4-9. Location of NPDES Facilities in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

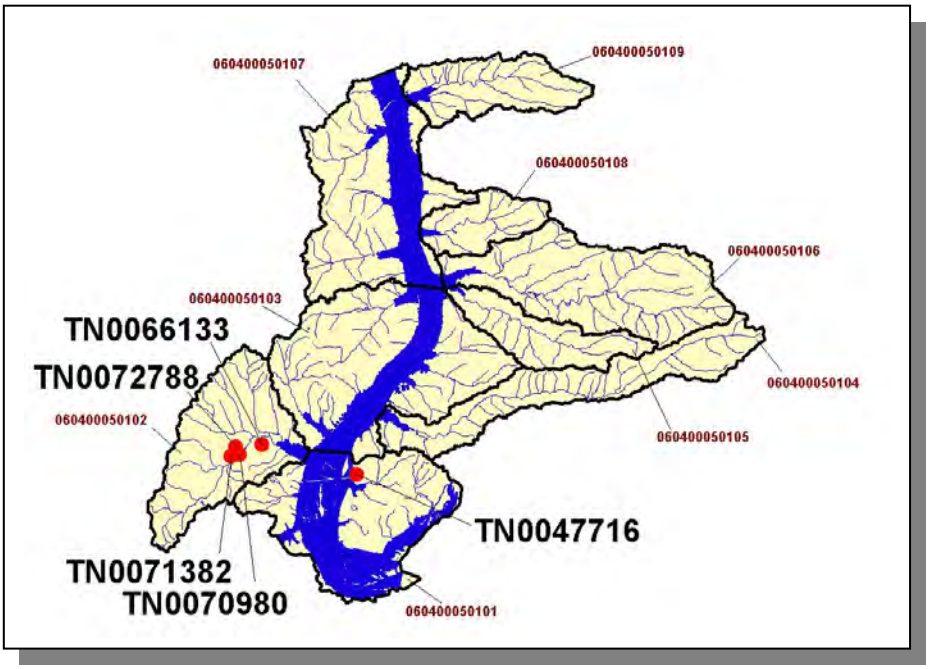


Figure 4-10. Location of Active Mining Facilities in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

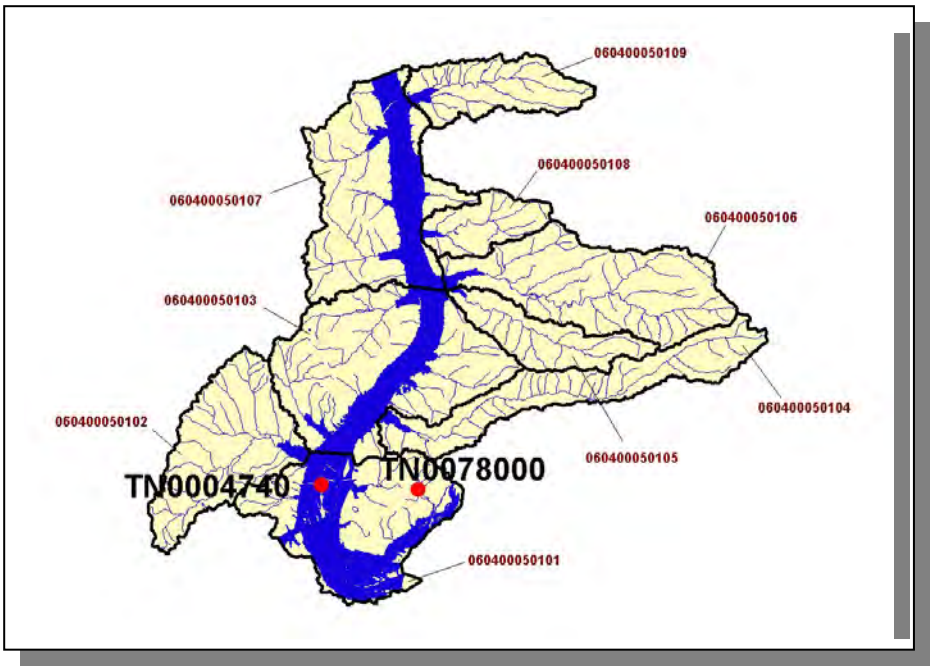


Figure 4-11. Location of Water Treatment Plants in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

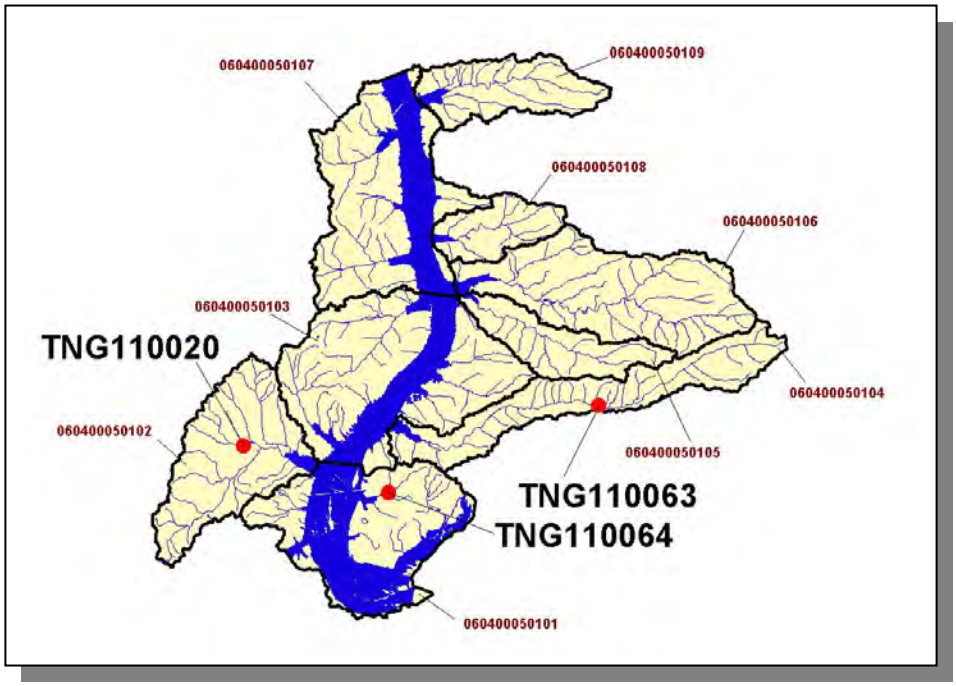


Figure 4-12. Location of Ready Mix Concrete Plants in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

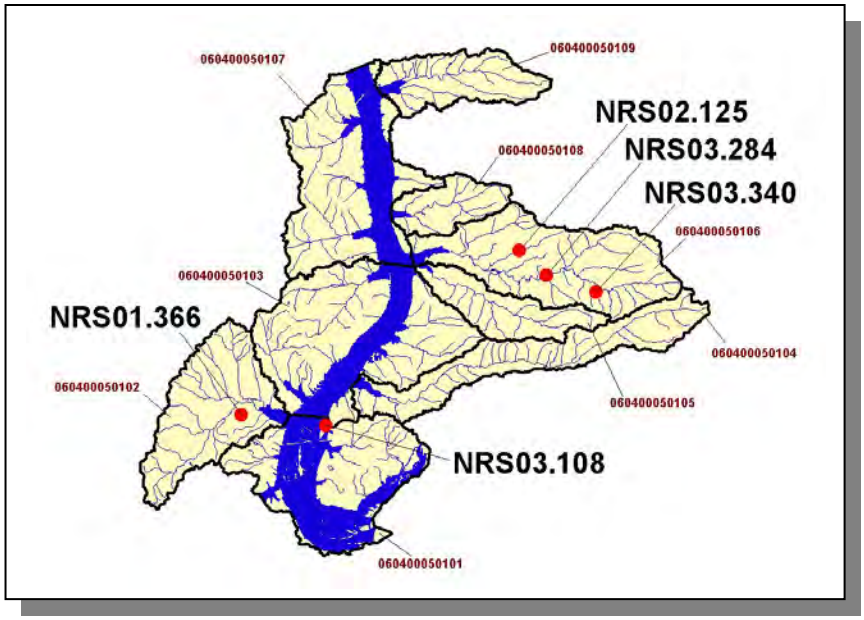


Figure 4-13. Location of ARAP Sites (Individual Permits) in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

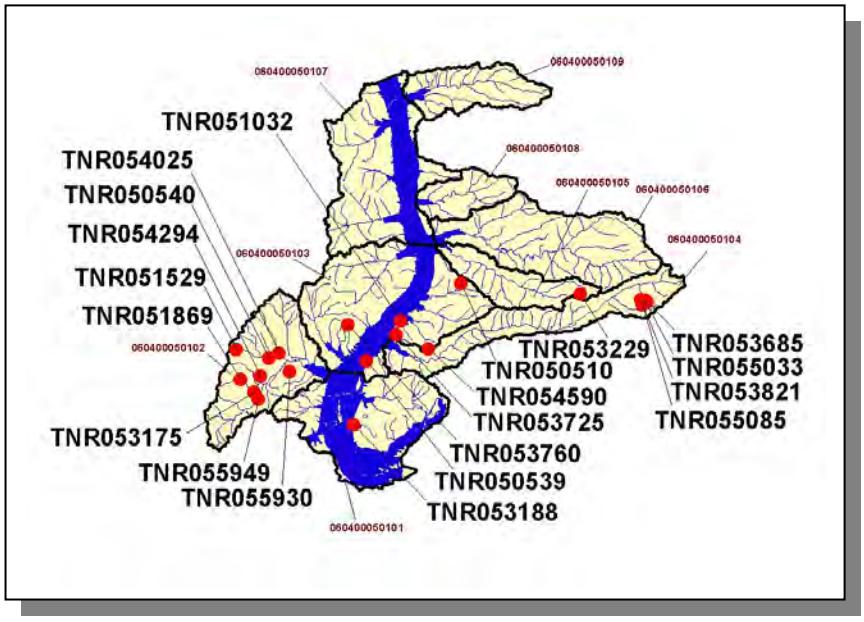


Figure 4-14. Location of TMSP Facilities in Subwatershed 0604000501. *Subwatershed 060400050101, 060400050102, 060400050103, 060400050104, 060400050105, 060400050106, 060400050107, 060400050108, and 060400050109 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

4.2.A.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens Sold	Hogs	Sheep
3,682	8,418	100	14	<5	734	<5

Table 4-5. Summary of Livestock Count Estimates in Subwatershed 0604000501. *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)
Benton	172.7	172.7	2.1	6.9
Houston	94.2	94.2	0	0
Humphreys	241.2	241.2	3.7	14.4
Stewart	219.7	219.7	5.4	25.4
Total	**727.8**	**727.8**	**11.2**	**46.7**

Table 4-6. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 0604000501.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.90
Grass (Hayland)	0.24
Legumes (Hayland)	1.37
Legumes, Grass (Hayland)	0.12
Grass, Forbs, Legumes (Mixed Pasture)	0.79
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	15.20
Sorghum (Row Crops)	5.80
Soybeans (Row Crops)	14.46
Tobacco (Row Crops)	6.01
Other Cropland not Planted	0.62
Conservation Reserve Program Lands	0.19
Other Land in Farms	0.05
Farmsteads and Ranch Headquarters	0.46

Table 4-7. Annual Estimated Total Soil Loss in Subwatershed 0604000501.

4.2.B. 0604000502 (Birdsong Creek).

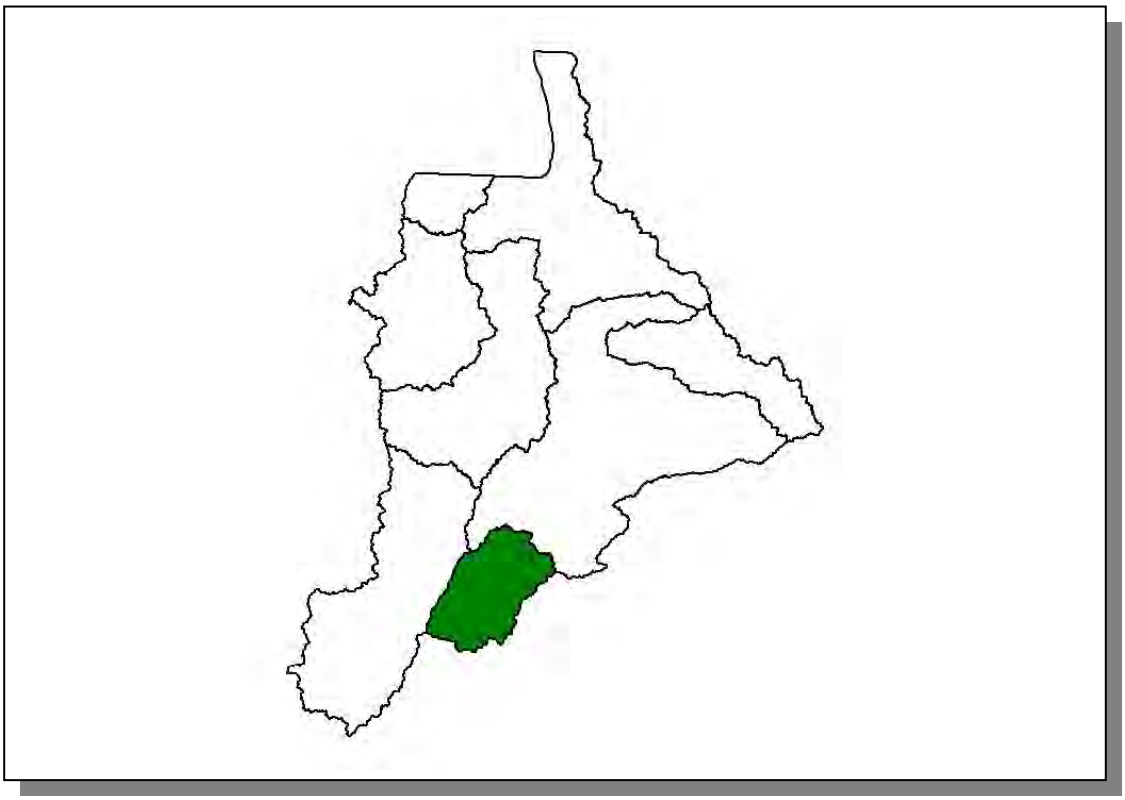


Figure 4-15. Location of Subwatershed 0604000502. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.B.i. General Description.

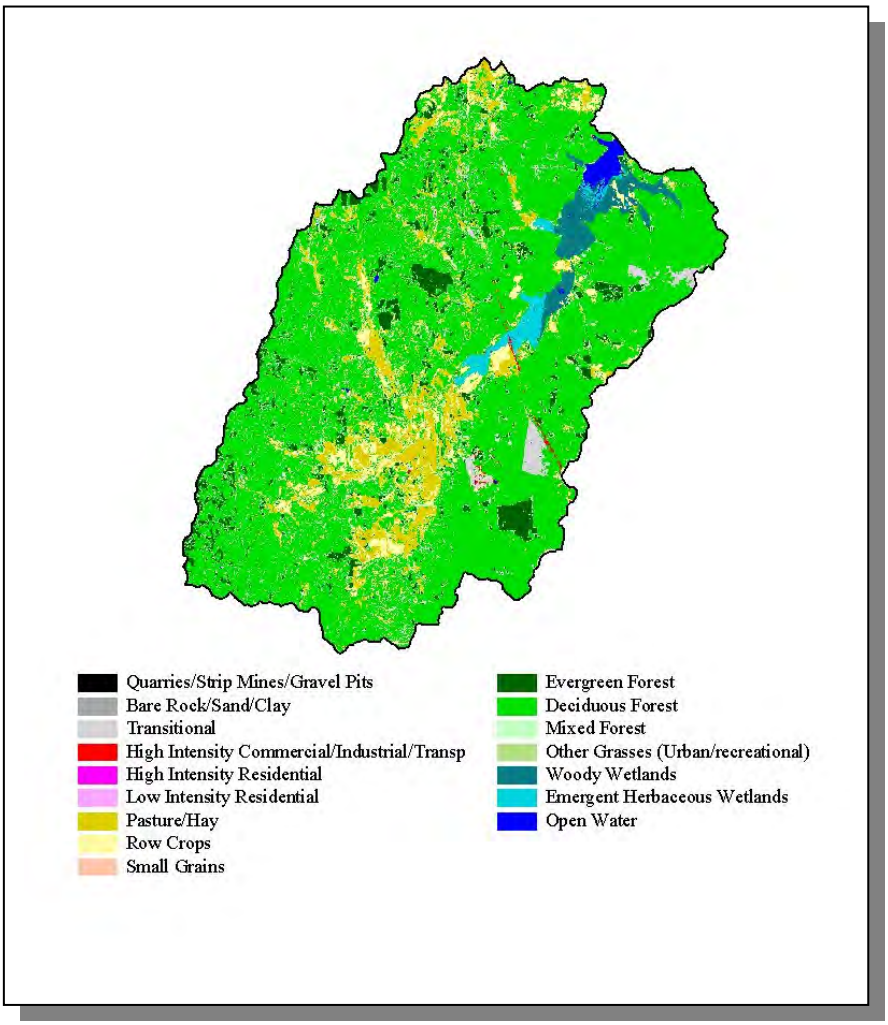


Figure 4-16. Illustration of Land Use Distribution in Subwatershed 0604000502.

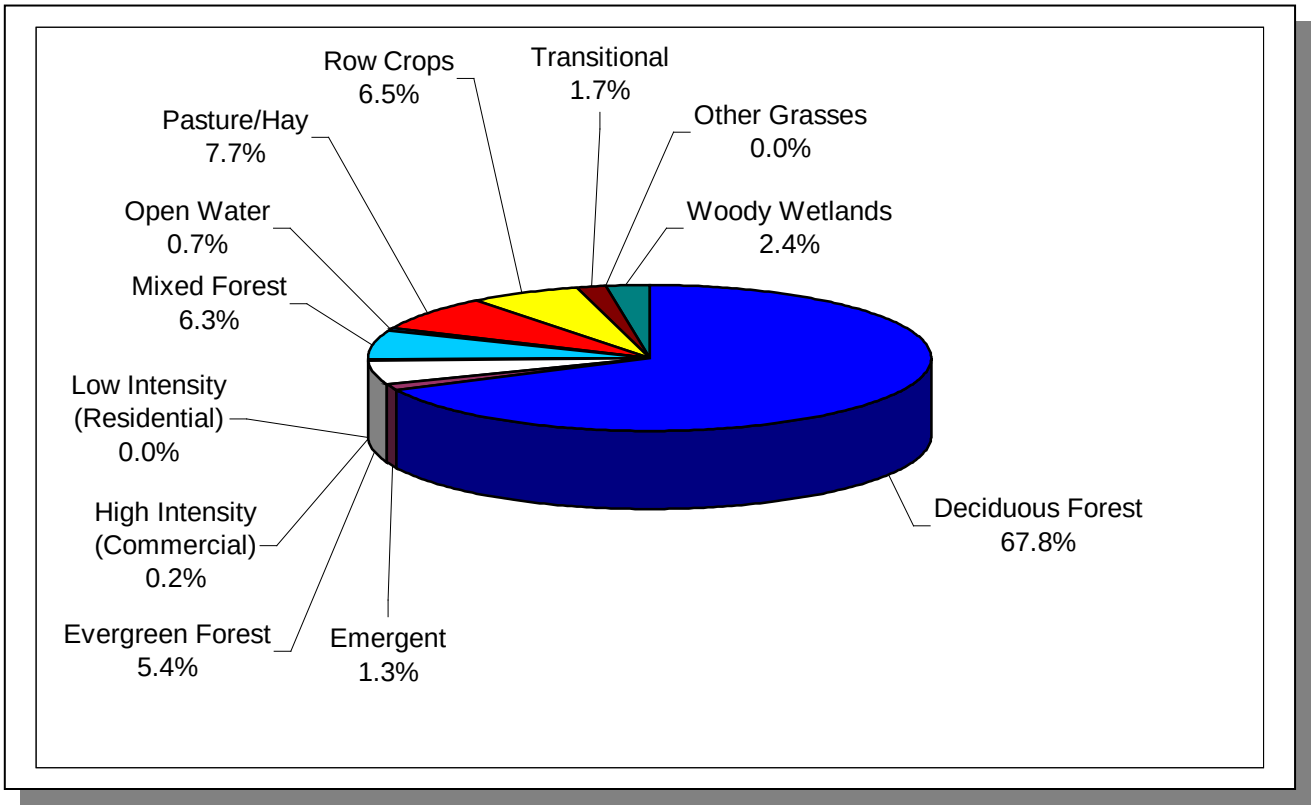


Figure 4-17. Land Use Distribution in Subwatershed 0604000502. *More information is provided in Appendix IV.*

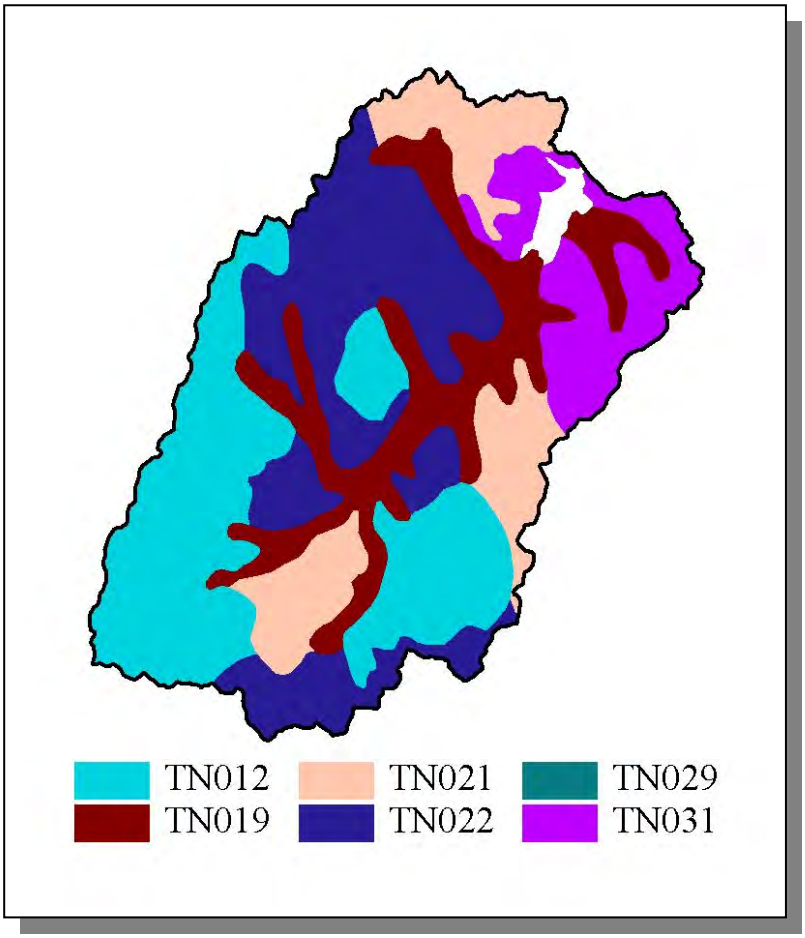


Figure 4-18. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000502.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN012	3.00	C	2.52	5.13	Silty Loam	0.39
TN019	186.00	C	1.54	4.76	Loam	0.26
TN021	15.00	C	1.30	5.00	Silty Loam	0.43
TN022	20.00	C	1.98	5.07	Loam	0.37
TN029	32.00	C	2.96	5.40	Loam	0.33
TN031	0.00	C	3.27	4.88	Loam	0.33

Table 4-8. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000502. *More information is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Benton	14,524	16,243	16,537	17.7	2,573	2,878	2,903	13.9
Carroll	27,514	28,990	29,475	1.05	288	303	308	6.9
Decatur	10,472	10,799	11,731	1.98	207	214	232	12.1
Henderson	21,844	24,000	25,522	0.02	5	5	5	0.0
Totals	**74,354**	**80,032**	**83,265**		**3,073**	**3,400**	**3,475**	**13.1**

Table 4-9. Population Estimates in Subwatershed 0604000502.

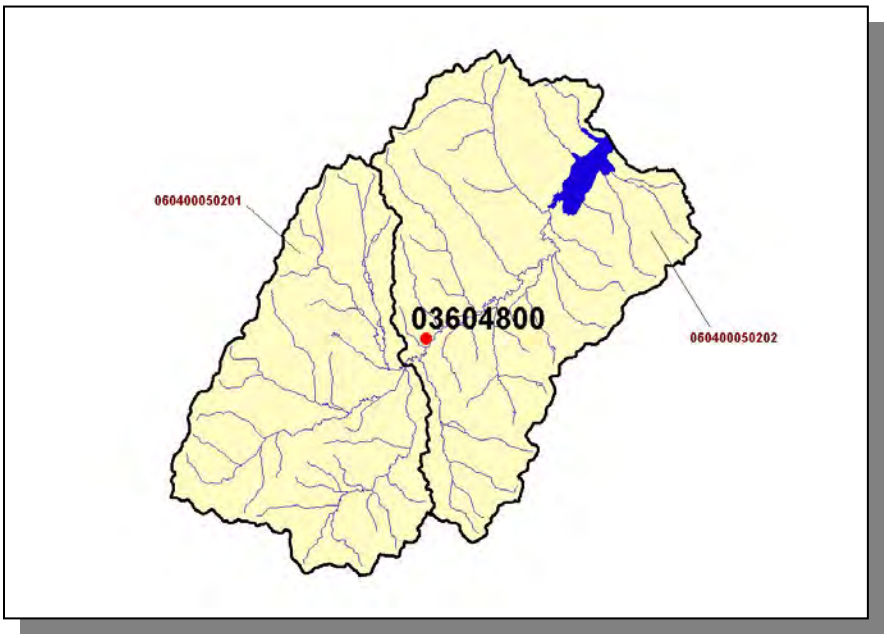


Figure 4-19. Location of Historical Streamflow Data Collection Sites in Subwatershed 0604000502. *Subwatershed 060400050201 and 060400050202 boundaries are shown for reference. More information is provided in Appendix IV.*

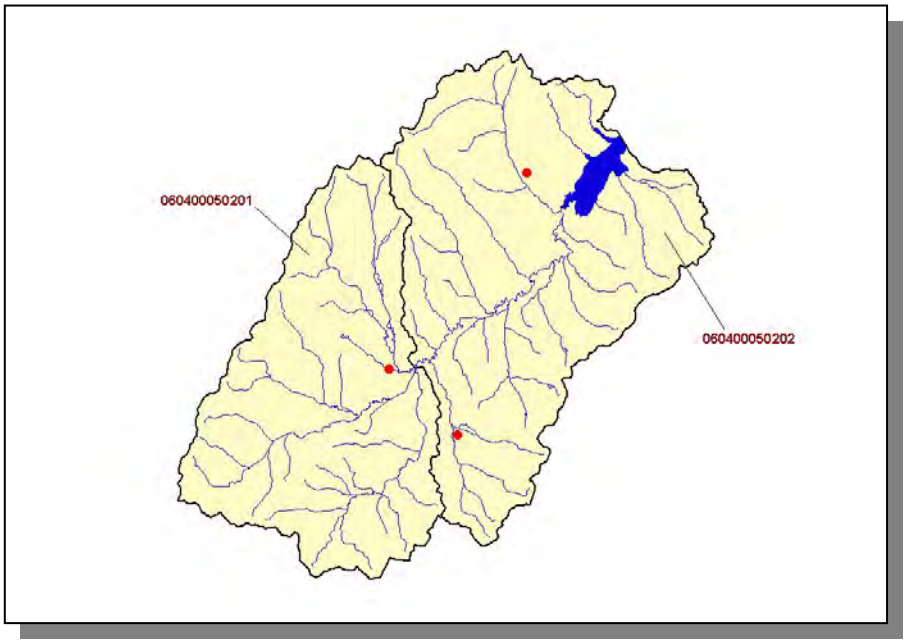


Figure 4-20. Location of STORET Monitoring Sites in Subwatershed 0604000502. *Subwatershed 060400050201 and 060400050202 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

4.2.B.ii. Point Source Contributions.

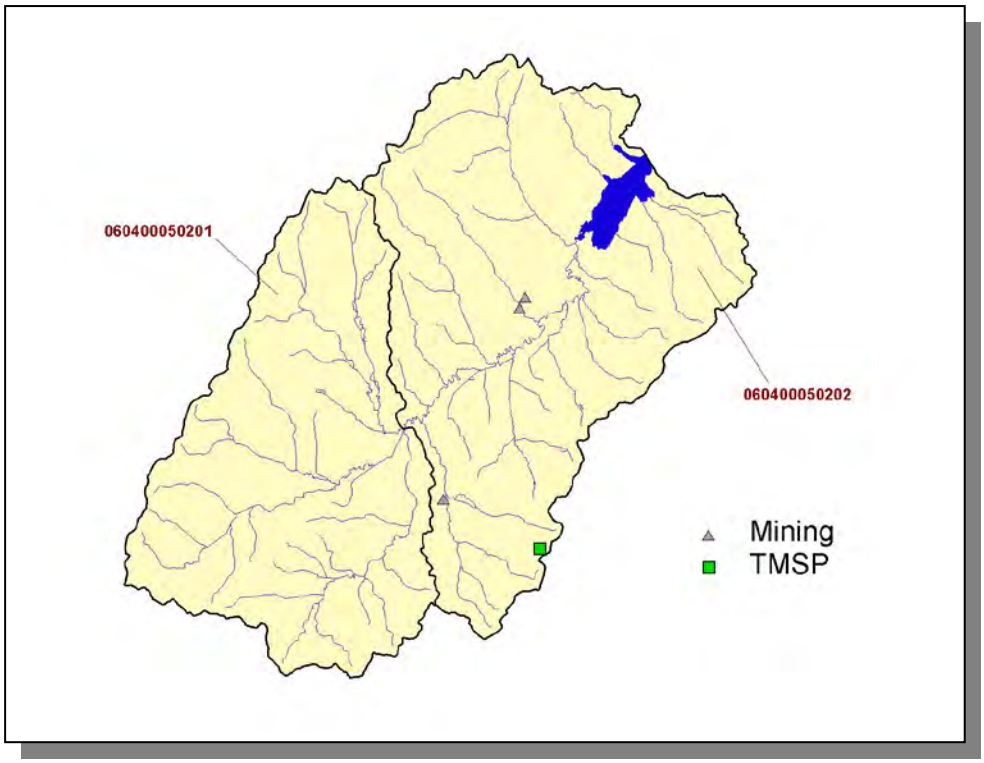


Figure 4-21. Location of Active Point Source Facilities in Subwatershed 0604000502. *Subwatershed 060400050201, 060400050202, 060400050203, 060400050204, 060400050205, 060400050206, 060400050207, 060400050208, and 060400050209 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

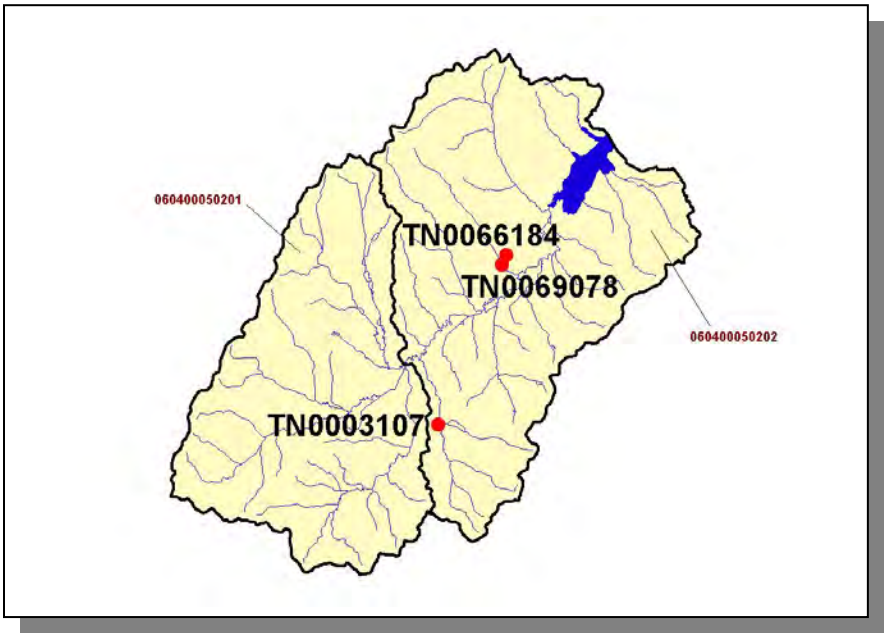


Figure 4-22. Location of Active Mining Facilities in Subwatershed 0604000502. *Subwatershed 060400050201, 060400050202, 060400050203, 060400050204, 060400050205, 060400050206, 060400050207, 060400050208, and 060400050209 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

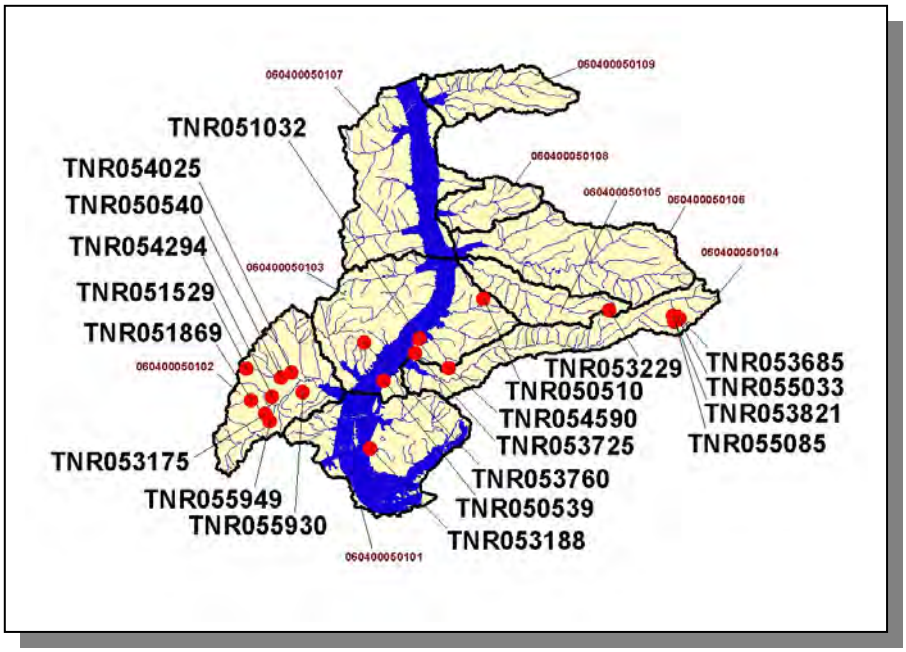


Figure 4-23. Location of TMSP Facilities in Subwatershed 0604000502. *Subwatershed 060400050201, 060400050202, 060400050203, 060400050204, 060400050205, 060400050206, 060400050207, 060400050208, and 060400050209 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens Sold	Hogs	Sheep
969	1,887	<5	<5	<5	394	<5

Table 4-10. Summary of Livestock Count Estimates in Subwatershed 0604000502. *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)
Benton	172.7	172.7	2.1	6.9
Carroll	169.1	169.1	0.6	2.0
Henderson	158.5	158.5	3.6	12.8
Total	**500.3**	**500.3**	**6.3**	**21.7**

Table 4-11. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0604000502.

CROPS	TONS/ACRE/YEAR
Legume (Pastureland)	0.41
Grass (Pastureland)	0.35
Grass (Hayland)	0.23
Legumes (Hayland)	0.52
Legumes, Grass (Hayland)	0.21
Grass, Forbs, Legumes (Mixed Pasture)	0.21
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	4.01
Cotton (Row Crops)	7.54
Sorghum (Row Crops)	1.71
Soybeans (Row Crops)	3.96
Wheat (Close Grown Cropland)	10.36
Other Cropland not Planted	1.58
Conservation Reserve Program Lands	0.38
Other Land in Farms	0.51
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.45

Table 4-12. Annual Estimated Total Soil Loss in Subwatershed 0604000502.

4.2.C. 0604000503 (White Oak Creek).

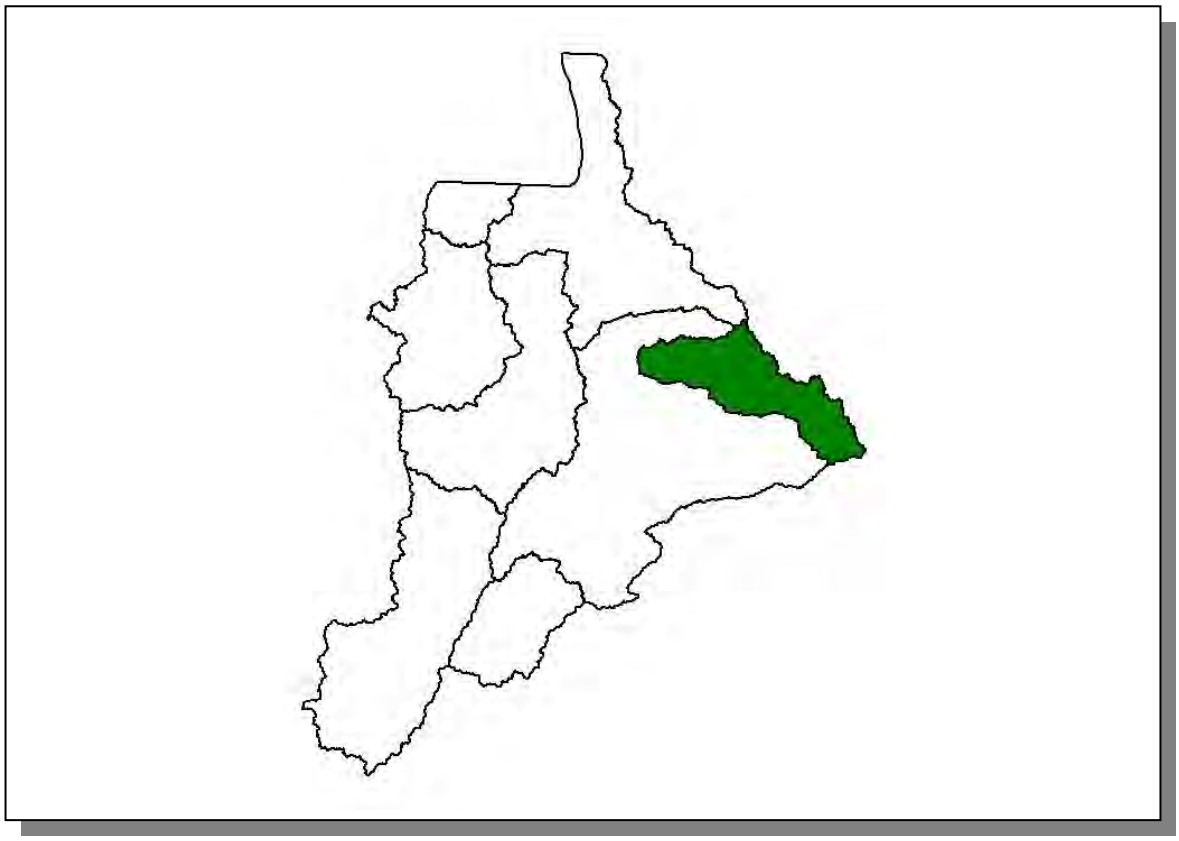


Figure 4-24. Location of Subwatershed 0604000503. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.C.i. General Description.

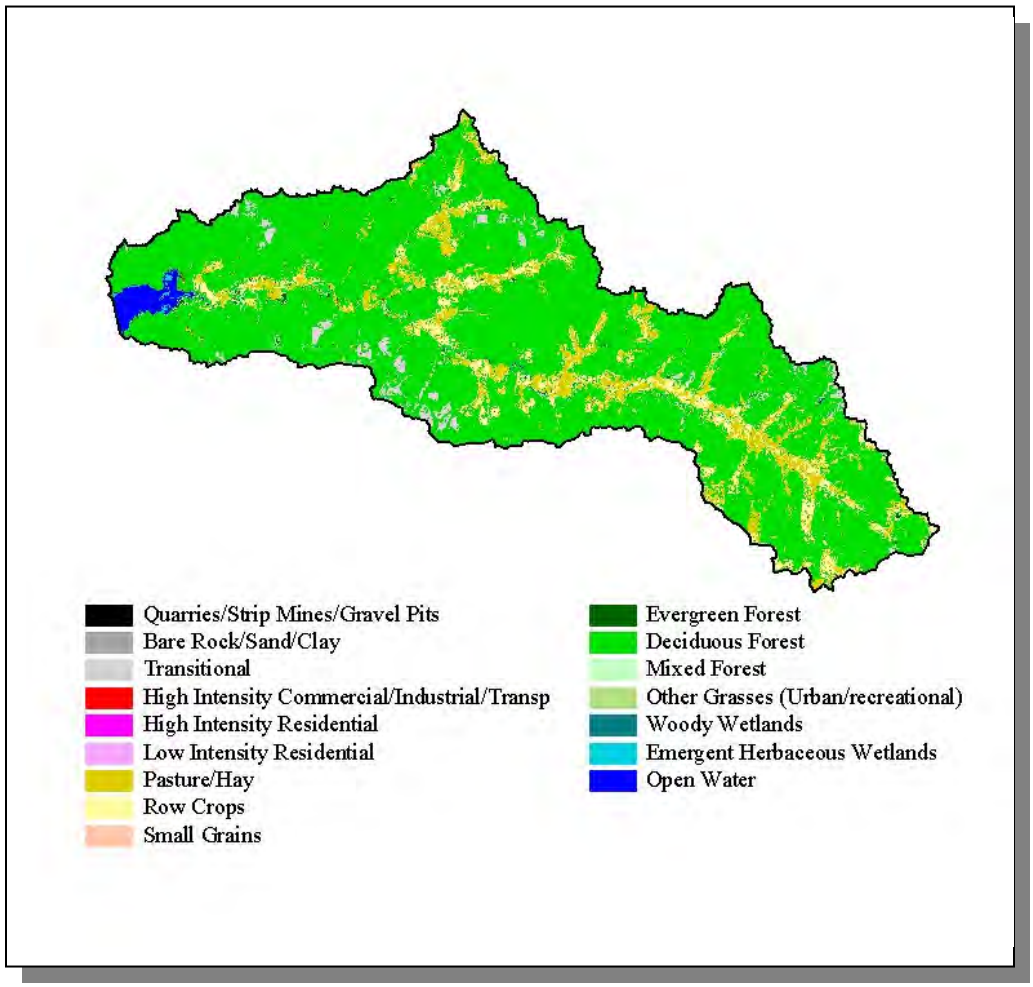


Figure 4-25. Illustration of Land Use Distribution in Subwatershed 0604000503.

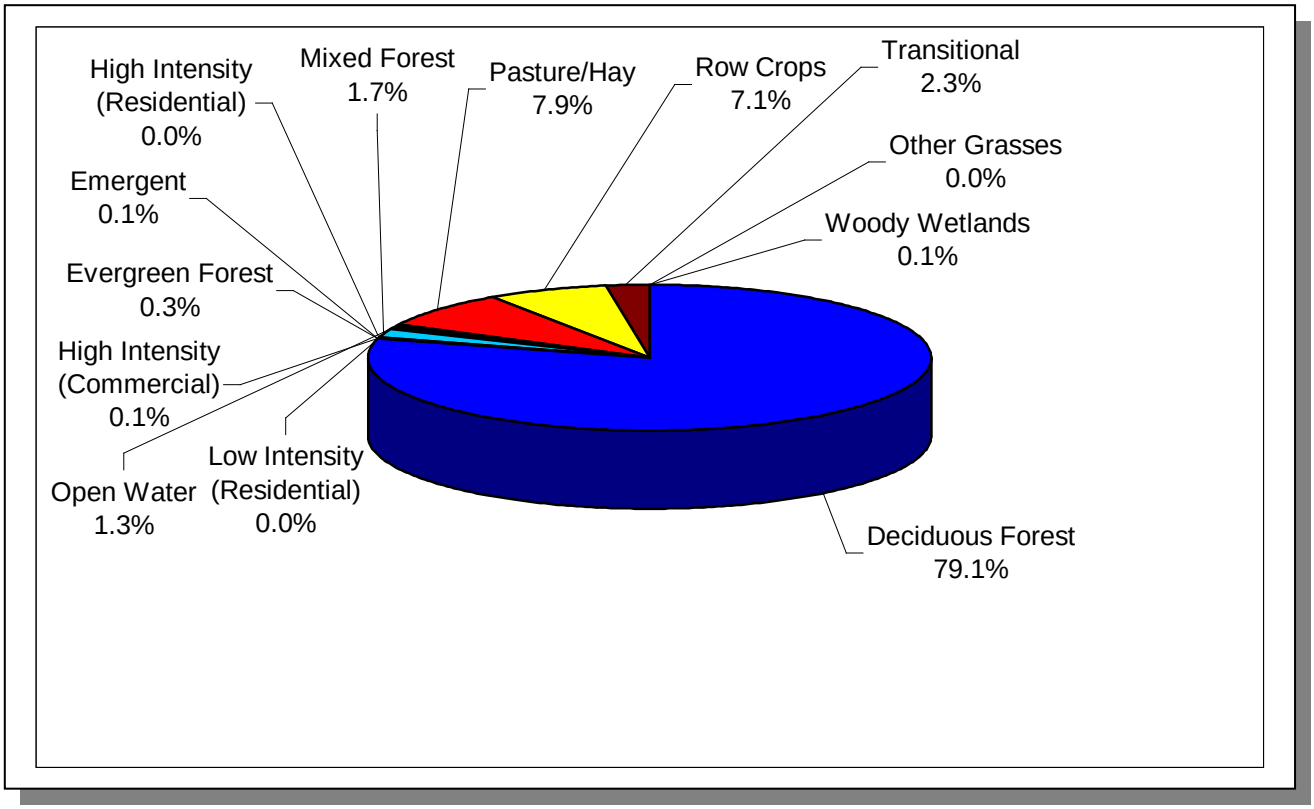


Figure 4-26. Land Use Distribution in Subwatershed 0604000503. *More information is provided in Appendix IV.*

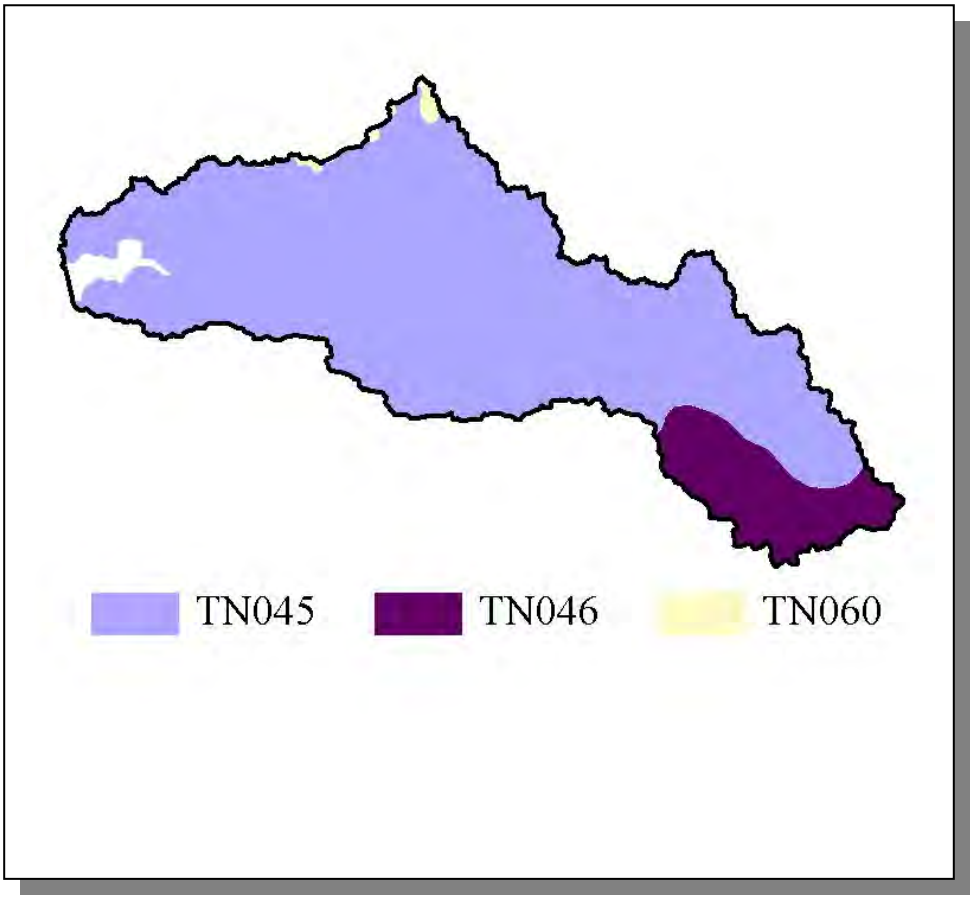


Figure 4-27. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000503.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN045	0.00	B	1.95	5.45	Loam	0.35
TN046	0.00	B	1.98	5.09	Silty Loam	0.38
TN060	20.00	B	1.30	5.32	Silty Loam	0.39

Table 4-13. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000503. *More information is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Dickson	35,061	40,937	43,156	0.01	4	5	5	25.0
Houston	7,018	7,769	8,088	27.14	1,905	2,109	2,195	15.2
Humphreys	15,795	16,839	17,929	9.18	1,449	1,545	1,645	13.5
Totals	**57,874**	**65,545**	**69,173**		**3,358**	**3,659**	**3,845**	**14.5**

Table 4-14. Population Estimates in Subwatershed 0604000503.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Tennessee Ridge	Houston	1,271	499	117	377	5

Table 4-15. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0604000503.

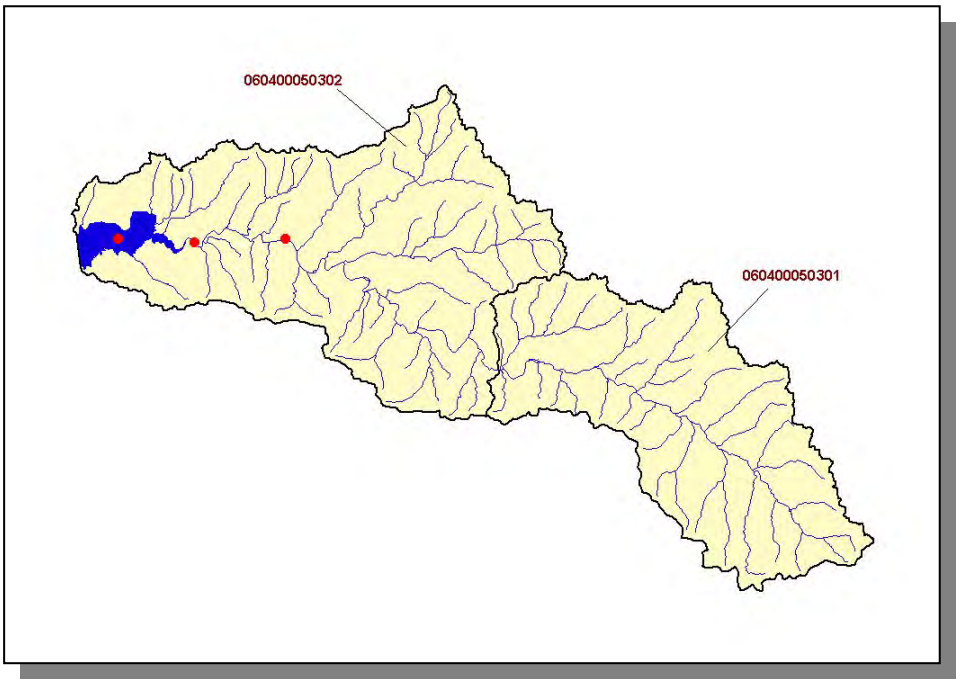


Figure 4-28. Location of STORET Monitoring Sites in Subwatershed 0604000503. *Subwatershed 060400050301 and 060400050302 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

4.2.C.ii. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.C.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
1,022	3,793	38	5	<5	140	<5

Table 4-16. Summary of Livestock Count Estimates in Subwatershed 0604000503. *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)
Dickson	174.3	174.3	1.8	7.7
Houston	94.2	94.2	0.0	0.0
Humphreys	241.2	241.2	3.7	14.4
Totals	**509.7**	**509.7**	**5.5**	**22.1**

Table 4-17. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0604000503.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	1.14
Grass (Hayland)	0.21
Legumes (Hayland)	2.01
Legumes, Grass (Hayland)	0.06
Grass, Forbs, Legumes (Mixed Pasture)	1.01
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	15.93
Sorghum (Row Crops)	5.80
Soybeans (Row Crops)	23.49
Other Vegetable and Truck Crops	7.71
Vineyard (Horticultural)	1.05
Conservation Reserve Program Lands	0.10
Other Land in Farms	0.12
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.40

Table 4-18. Annual Estimated Total Soil Loss in Subwatershed 0604000503.

4.2.D. 0604000504 (Tennessee River).

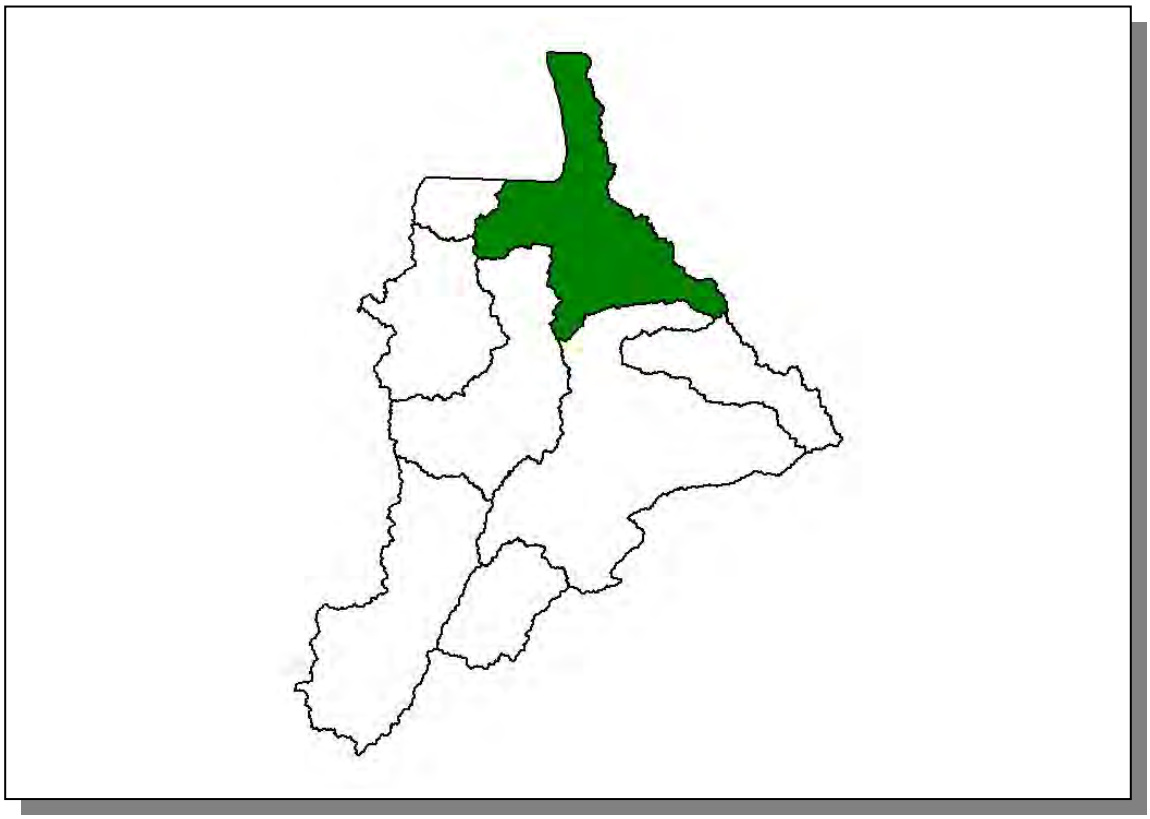


Figure 4-29. Location of Subwatershed 0604000504. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.D.i. General Description.

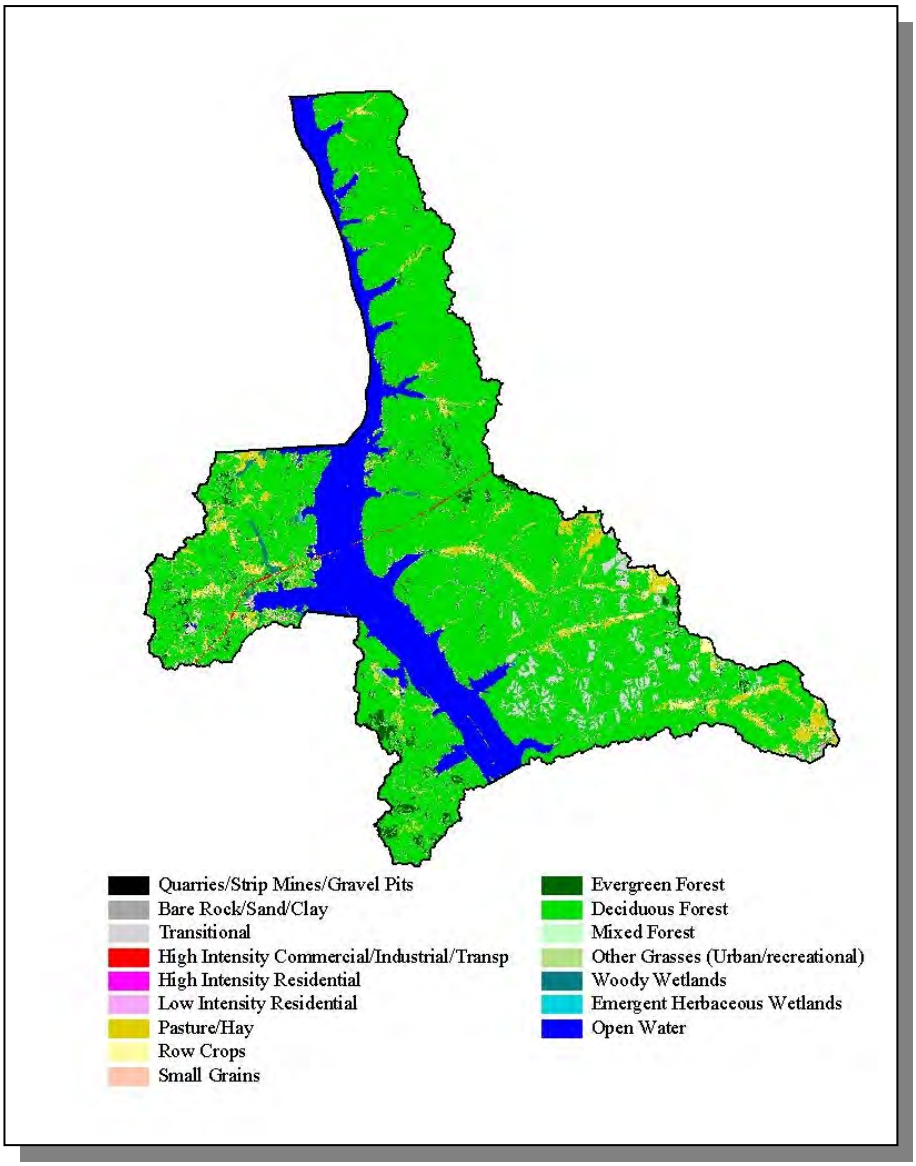


Figure 4-30. Illustration of Land Use Distribution in Subwatershed 0604000504.

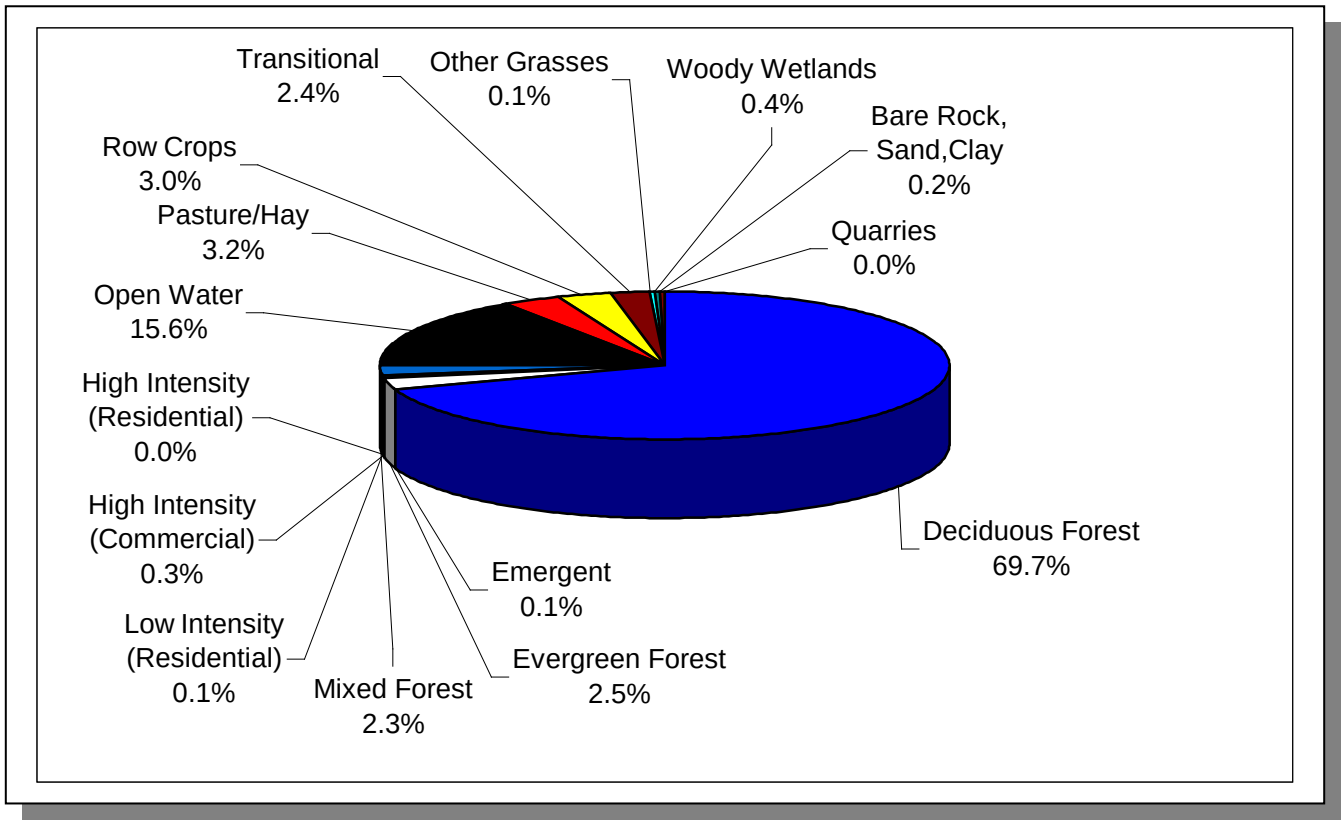


Figure 4-31. Land Use Distribution in Subwatershed 0604000504. *More information is provided in Appendix IV.*

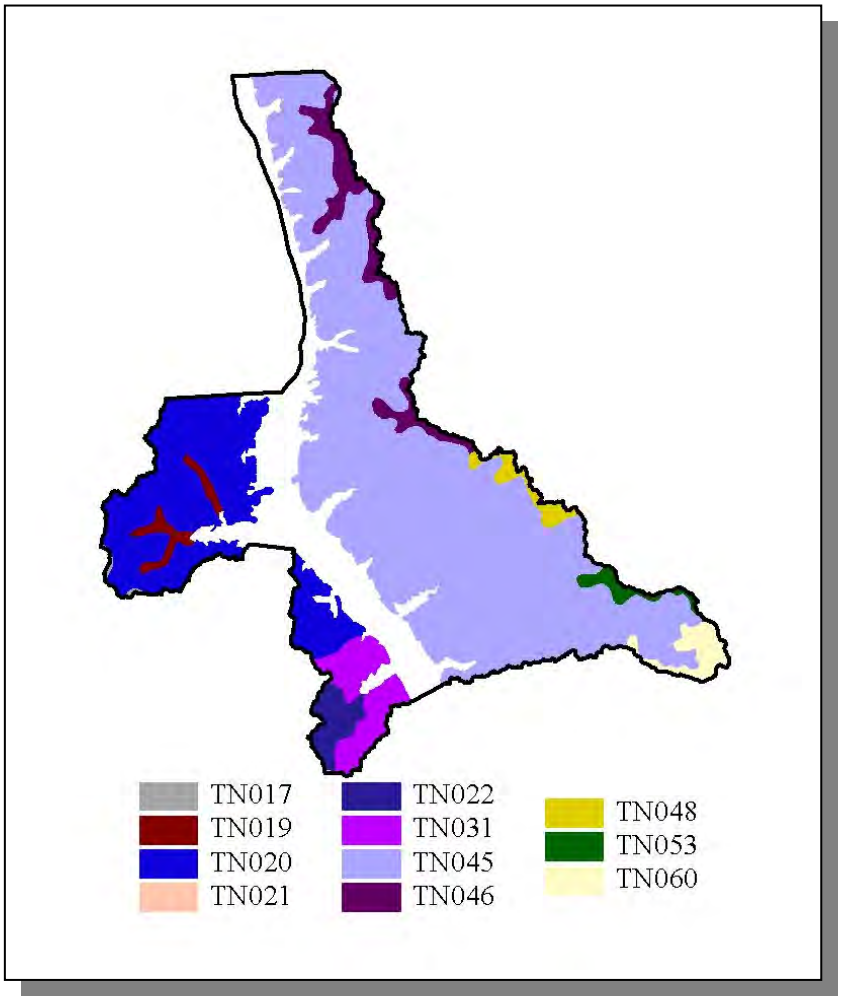


Figure 4-32. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000504.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN017	0.00	B	1.81	5.26	Silty Loam	0.45
TN019	186.0	C	1.54	4.76	Loam	0.26
TN020	0.00	C	1.57	5.11	Silty Loam	0.40
TN021	15.00	C	1.30	5.00	Silty Loam	0.43
TN022	20.00	C	1.98	5.07	Loam	0.37
TN031	0.00	C	3.27	4.88	Loam	0.33
TN045	0.00	B	1.95	5.45	Loam	0.35
TN046	0.00	B	1.98	5.09	Silty Loam	0.38
TN048	16.00	C	1.38	5.06	Silty Loam	0.42
TN053	0.00	B	1.29	5.45	Loam	0.33
TN060	20.00	B	1.30	5.32	Silty Loam	0.39

Table 4-19. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000504. *More information is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Benton	14,524	16,243	16,537	4.39	638	714	727	13.9
Henry	27,888	29,830	31,115	9.40	2,622	2,804	2,925	11.6
Houston	7,018	7,769	8,088	6.05	424	470	489	15.3
Stewart	9,479	11,241	12,370	28.18	2,671	3,168	3,486	30.5
Totals	**58,909**	**65,083**	**68,110**		**6,355**	**7,156**	**7,627**	**20.0**

Table 4-20. Population Estimates in Subwatershed 0604000504.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Tennessee Ridge	Houston	1,271	499	117	377	5

Table 4-21. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0604000504.

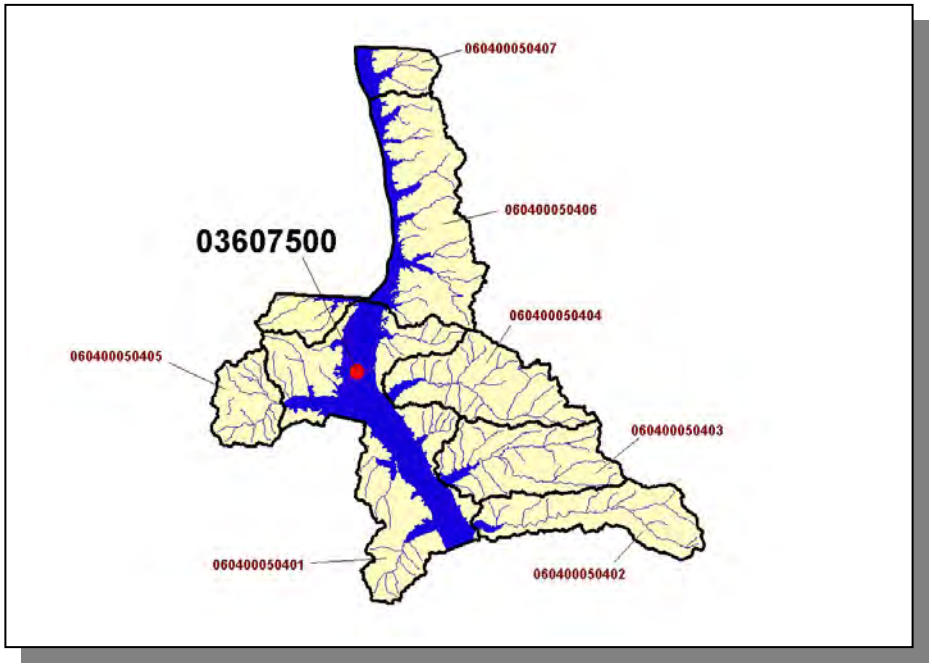


Figure 4-33. Location of Historical Streamflow Data Collection Sites in Subwatershed 0604000504. *Subwatershed 060400050401, 060400050402, 060400050403, 060400050404, 060400050405, 060400050406 and 060400050407 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

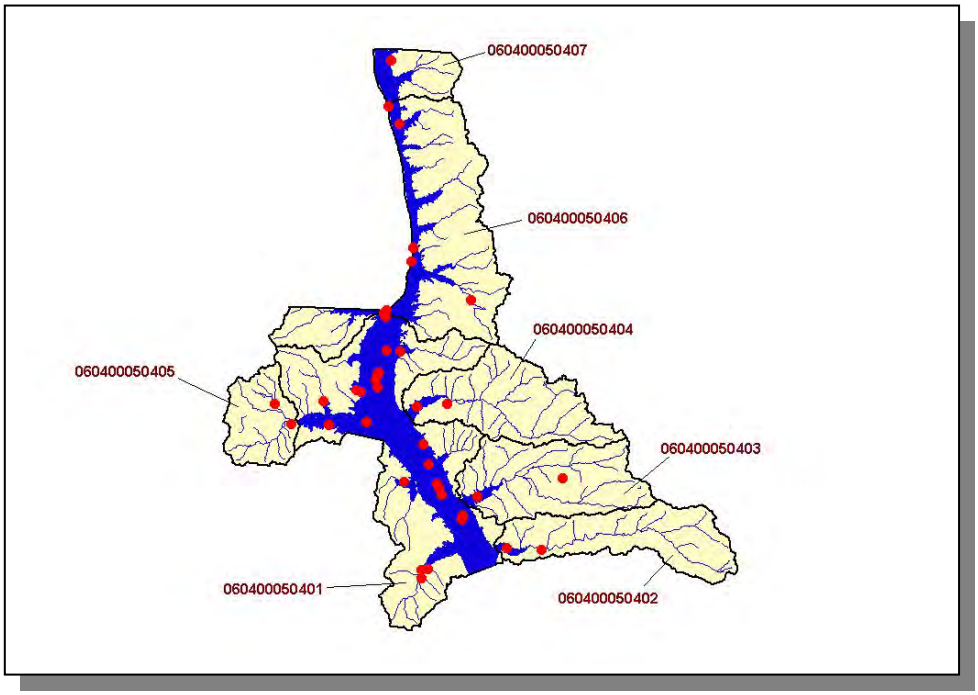


Figure 4-34. Location of STORET Monitoring Sites in Subwatershed 0604000504. *Subwatershed 060400050401, 060400050402, 060400050403, 060400050404, 060400050405, 060400050406 and 060400050407 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

4.2.D.ii. Point Source Contributions.

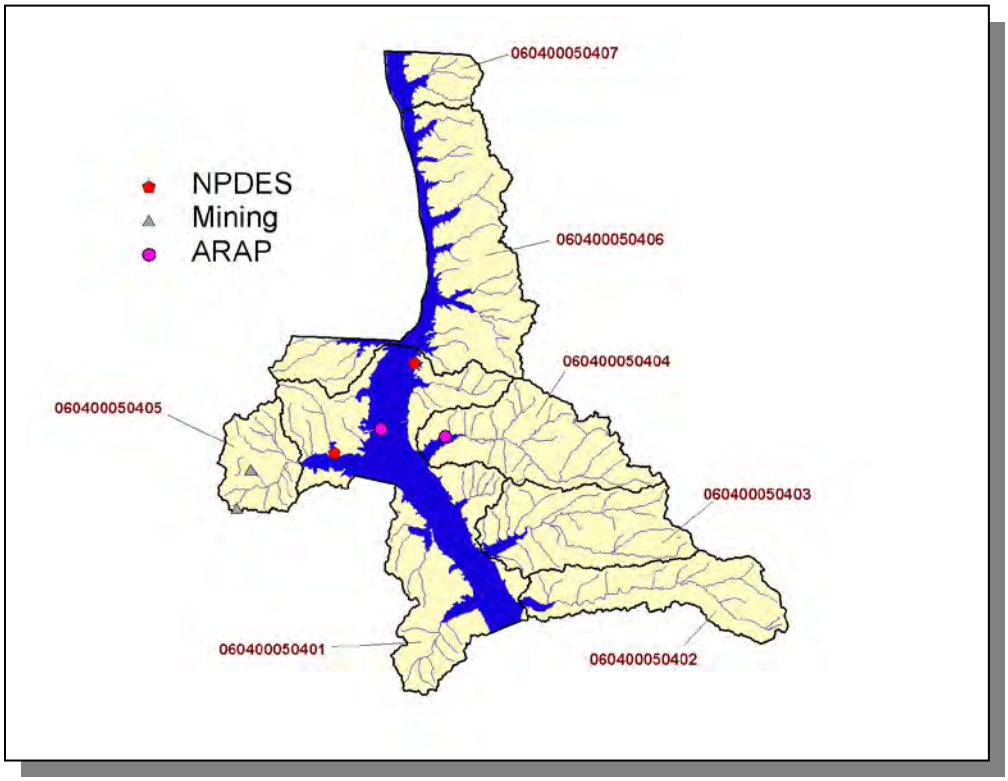


Figure 4-35. Location of Active Point Source Facilities in Subwatershed 0604000504. *Subwatershed 060400050401, 060400050402, 060400050403, 060400050404, 060400050405, 060400050406, and 060400050407 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

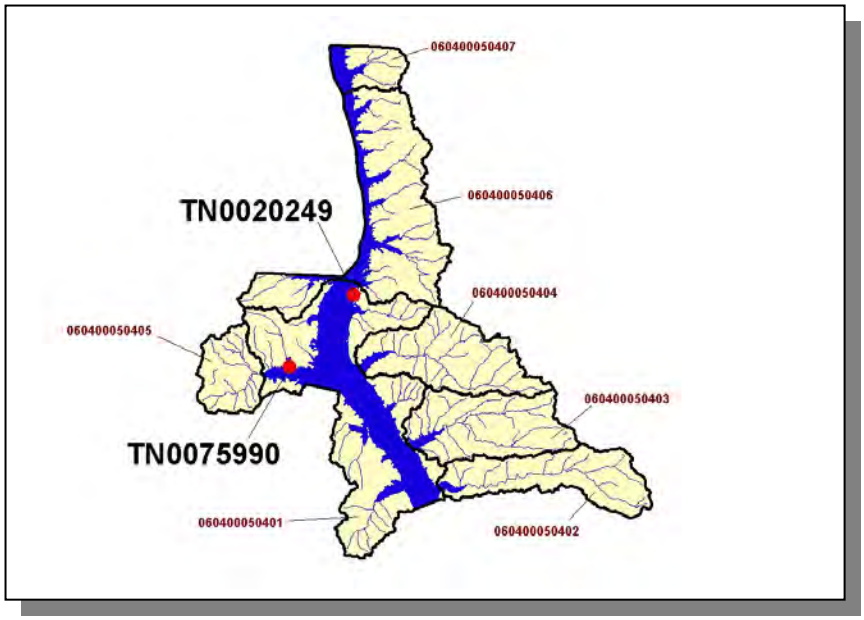


Figure 4-36. Location of NPDES Facilities in Subwatershed 0604000504. *Subwatershed 060400050401, 060400050402, 060400050403, 060400050404, 060400050405, 060400050406, and 060400050407 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

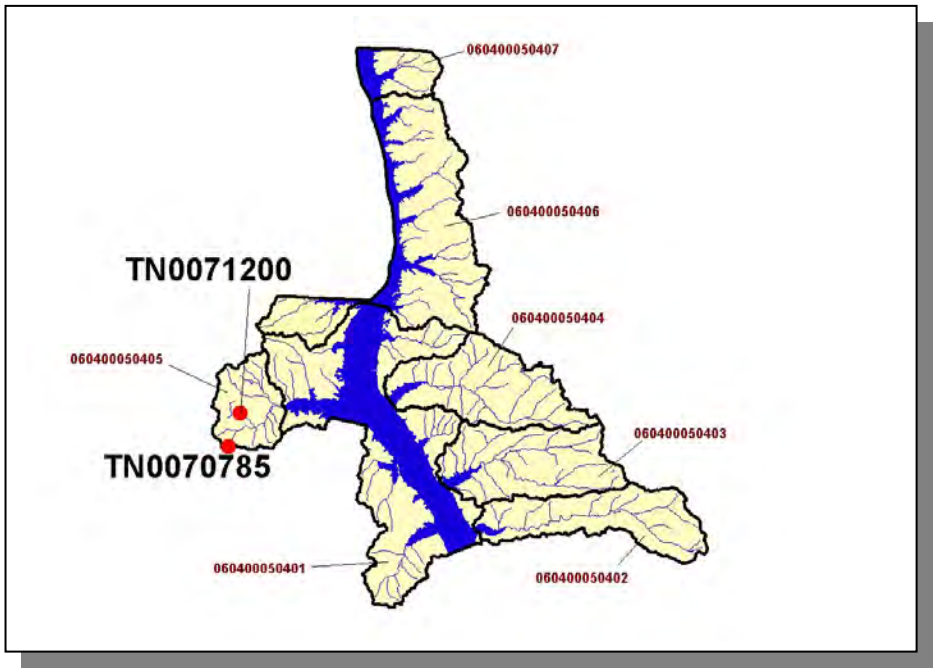


Figure 4-37. Location of Active Mining Facilities in Subwatershed 0604000504. *Subwatershed 060400050401, 060400050402, 060400050403, 060400050404, 060400050405, 060400050406, and 060400050407 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

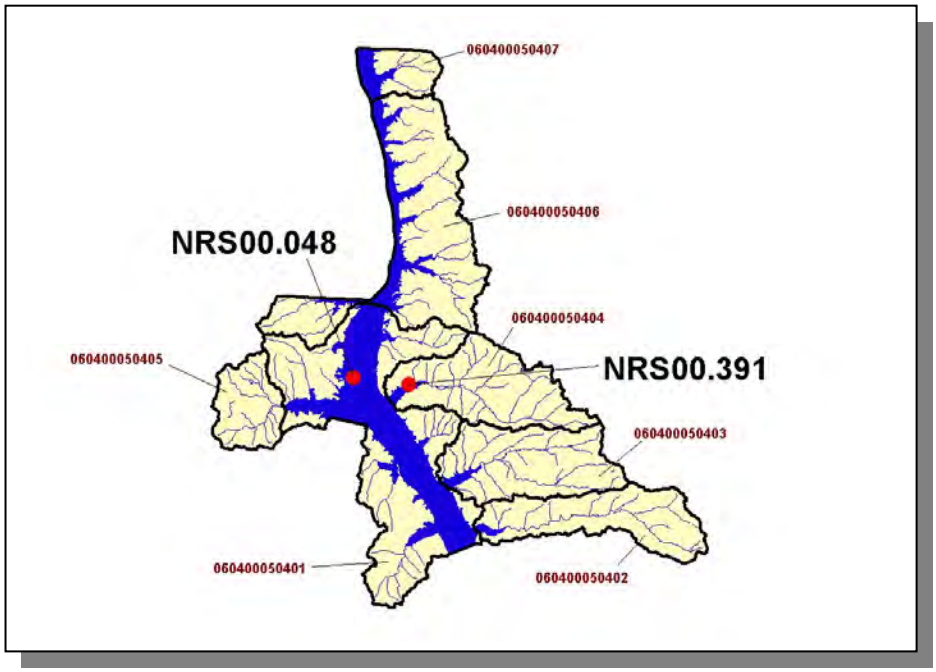


Figure 4-38. Location of ARAP Sites (Individual Permits) in Subwatershed 0604000504. *Subwatershed 060400050401, 060400050402, 060400050403, 060400050404, 060400050405, 060400050406, and 060400050407 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

4.2.D.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Milk Cow	Cattle	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
167	25	2,261	<5	<5	632	5

Table 4-22. Summary of Livestock Count Estimates in Subwatershed 0604000504*. 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)
Benton	172.7	172.7	2.1	6.9
Henry	176.1	176.1	1.9	7.1
Houston	94.2	94.2	0	0
Stewart	219.7	219.7	5.4	25.4
Total	**662.7**	**662.7**	**9.4**	**39.4**

Table 4-23. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0604000504.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	1.01
Grass (Hayland)	0.12
Legumes (Hayland)	0.57
Legumes, Grass (Hayland)	0.13
Grass, Forbs, Legumes (Mixed Pasture)	0.32
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	3.71
Soybeans (Row Crops)	8.13
Tobacco (Row Crops)	6.04
All Other Row Crops	4.68
Wheat (Close Grown Cropland)	6.01
Other (Horticultural)	16.41
Other Cropland not Planted	2.11
Conservation Reserve Program Lands	0.50
Other Land in Farms	0.29
Nonagricultural land Use	0.00
Farmsteads and Ranch Headquarters	0.16

Table 4-24. Annual Soil Loss in Subwatershed 0604000504.

4.2.E. 0604000505 (Big Sandy River).

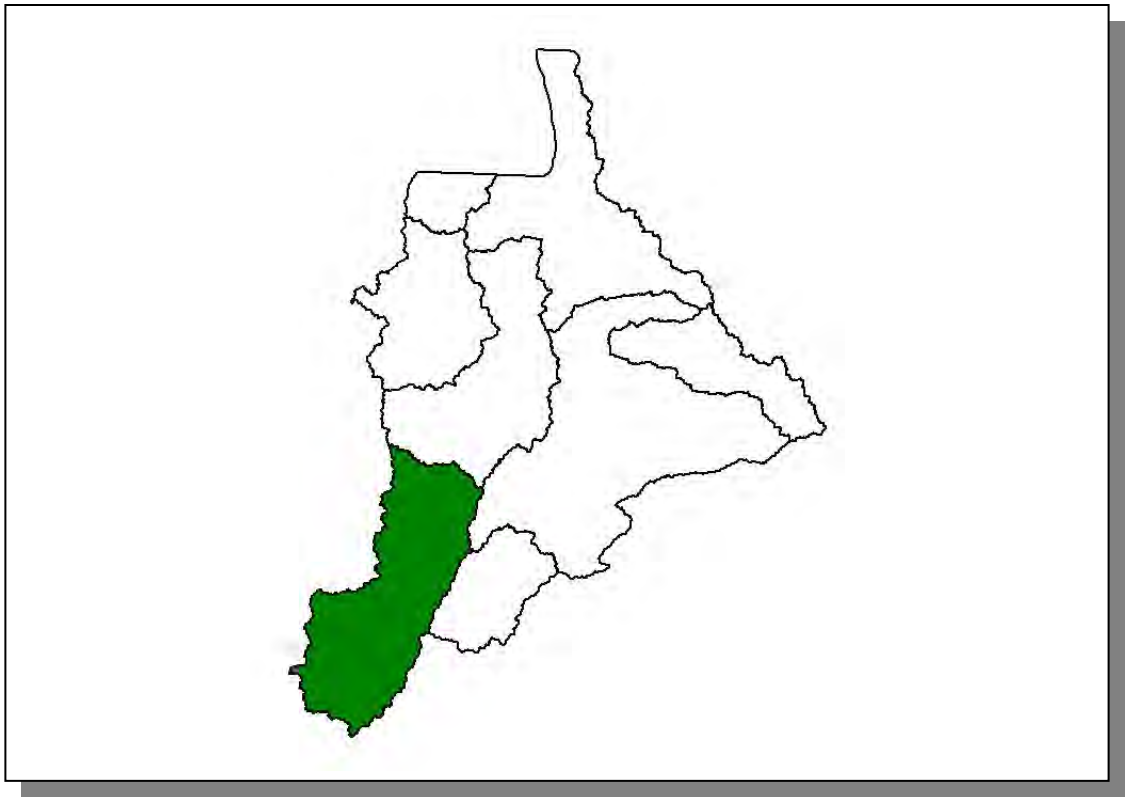


Figure 4-39. Location of Subwatershed 0604000505. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.E.i. General Description.

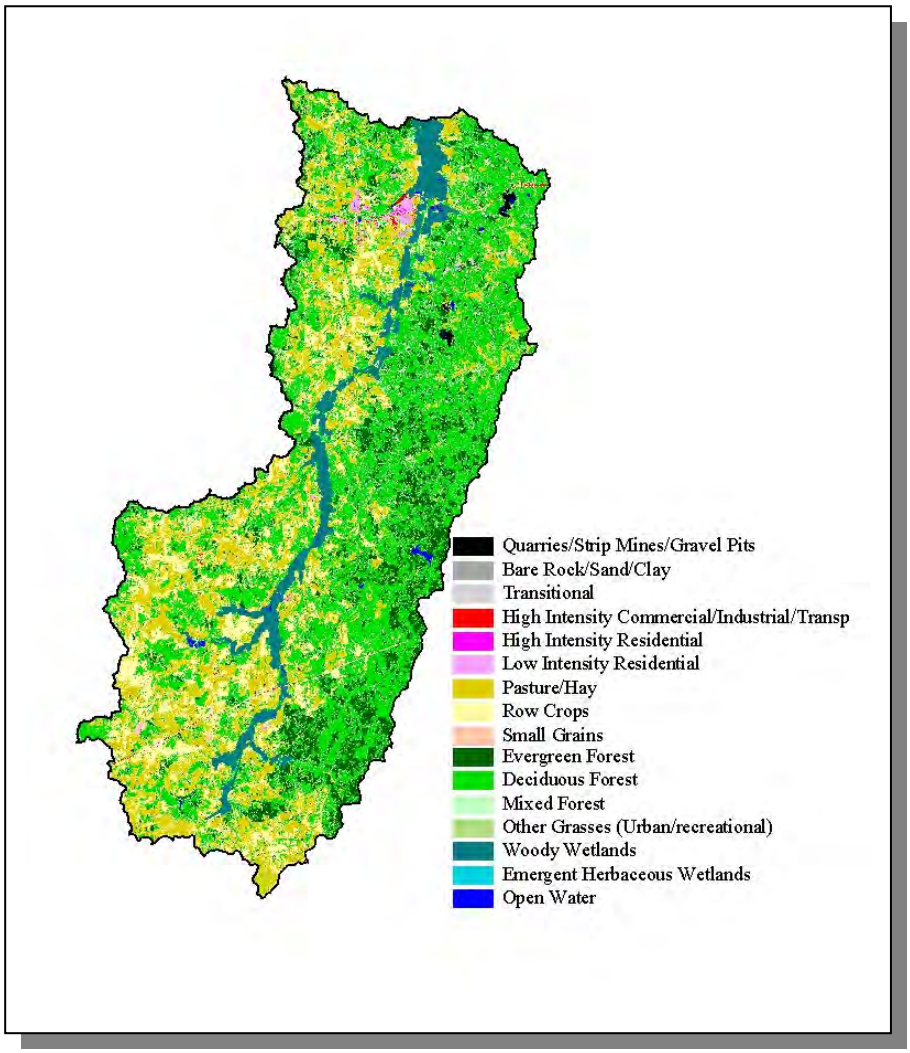


Figure 4-40. Illustration of Land Use Distribution in Subwatershed 0604000505.

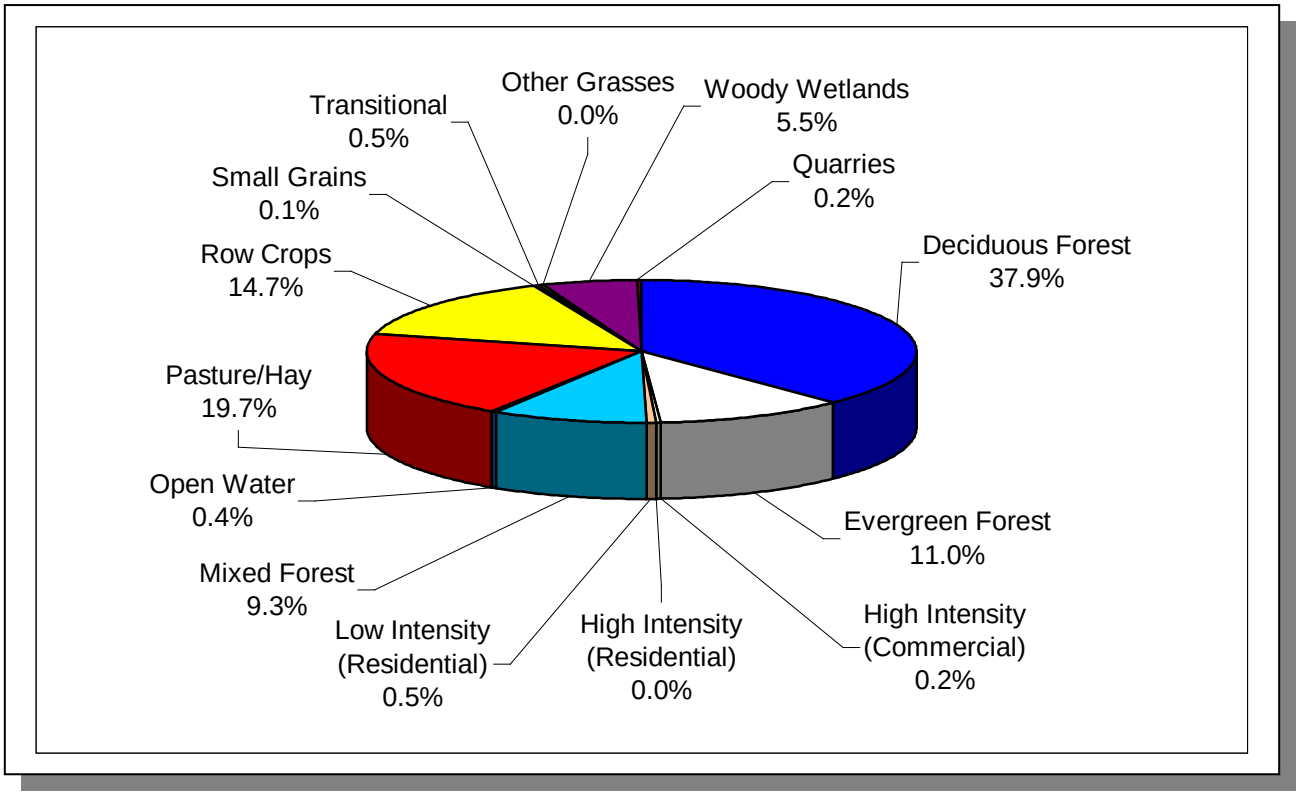


Figure 4-41. Land Use Distribution in Subwatershed 0604000505. *More information is provided in Appendix IV.*

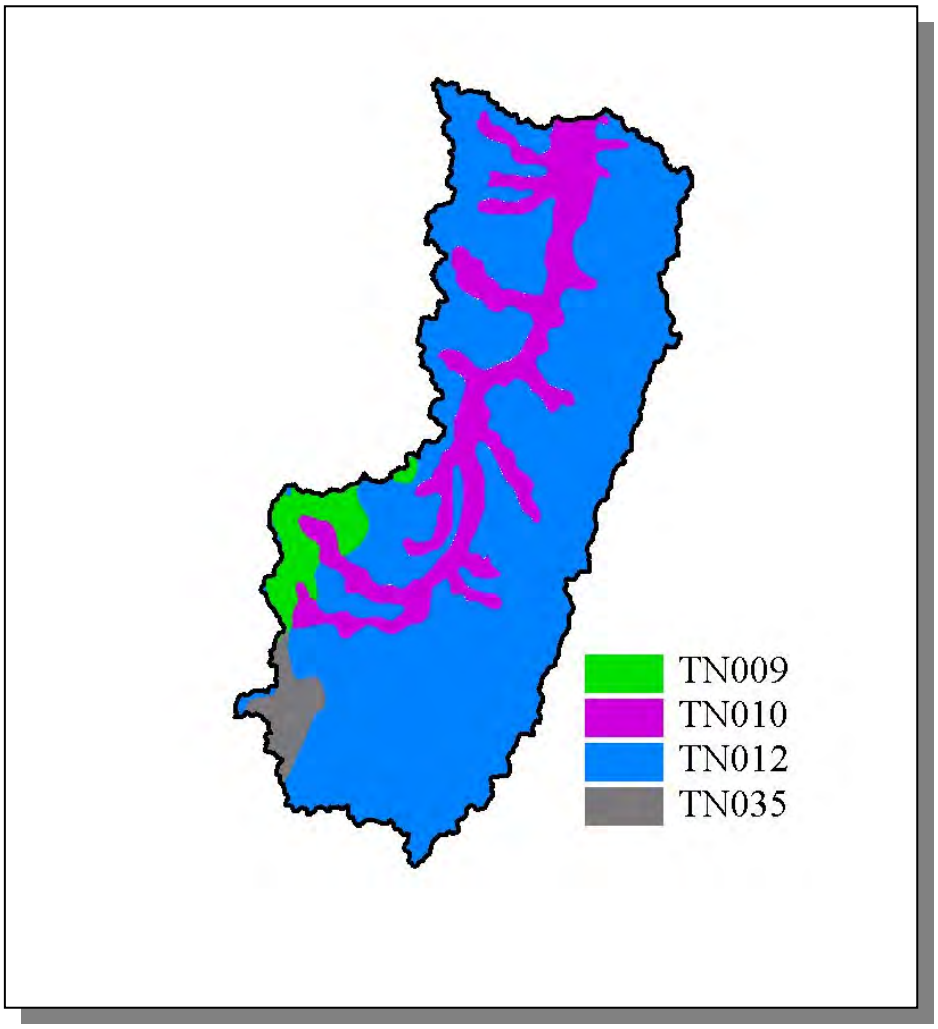


Figure 4-42. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000505.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN009	14.00	C	1.30	5.10	Silty Loam	0.43
TN010	243.00	C	1.33	5.11	Silty Loam	0.44
TN012	3.00	C	2.52	5.13	Silty Loam	0.39
TN035	32.00	C	1.46	4.97	Silty Loam	0.40

Table 4-25. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000505. *More information is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Benton	14,524	16,243	16,537	6.17	896	1,002	1,020	13.8
Carroll	27,514	28,990	29,475	24.27	6,678	7,036	7,154	7.1
Henderson	21,844	24,000	25,522	13.83	3,020	3,318	3,529	16.9
Totals	**63,882**	**69,233**	**71,534**		**10,594**	**11,356**	**11,703**	**10.5**

Table 4-26. Population Estimates in Subwatershed 0604000505.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Bruceton	Carroll	1,586	699	668	31	0
Clarksburg	Carroll	307	138	20	114	4
Hollow Rock	Carroll	902	397	48	339	10
Parker's Crossroads	Henderson	167	82	0	82	0
Totals		**2,952**	**1,316**	**736**	**566**	**14**

Table 4-27. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0604000505.

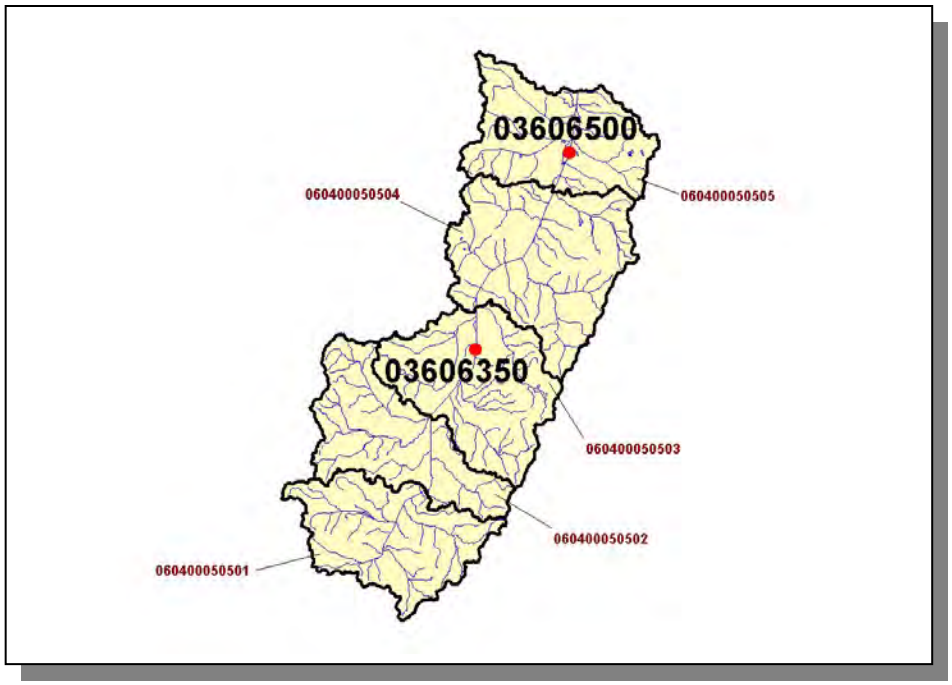


Figure 4-43. Location of Historical Streamflow Data Collection Sites in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504 and 060400050405 boundaries are shown for reference. More information is provided in Appendix IV.*

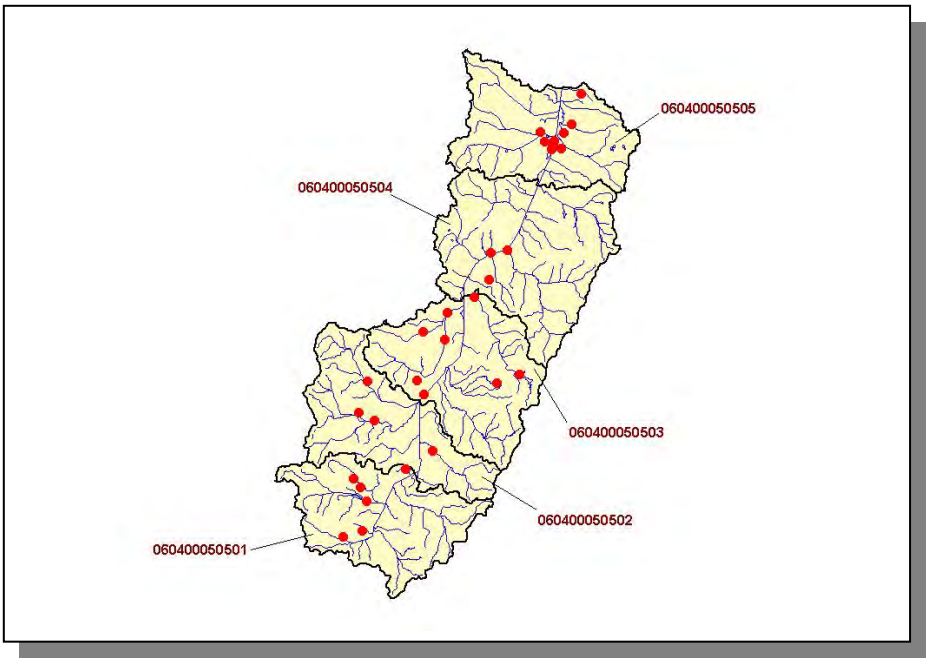


Figure 4-44. Location of STORET Monitoring Sites in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504 and 060400050405 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

4.2.E.ii. Point Source Contributions.

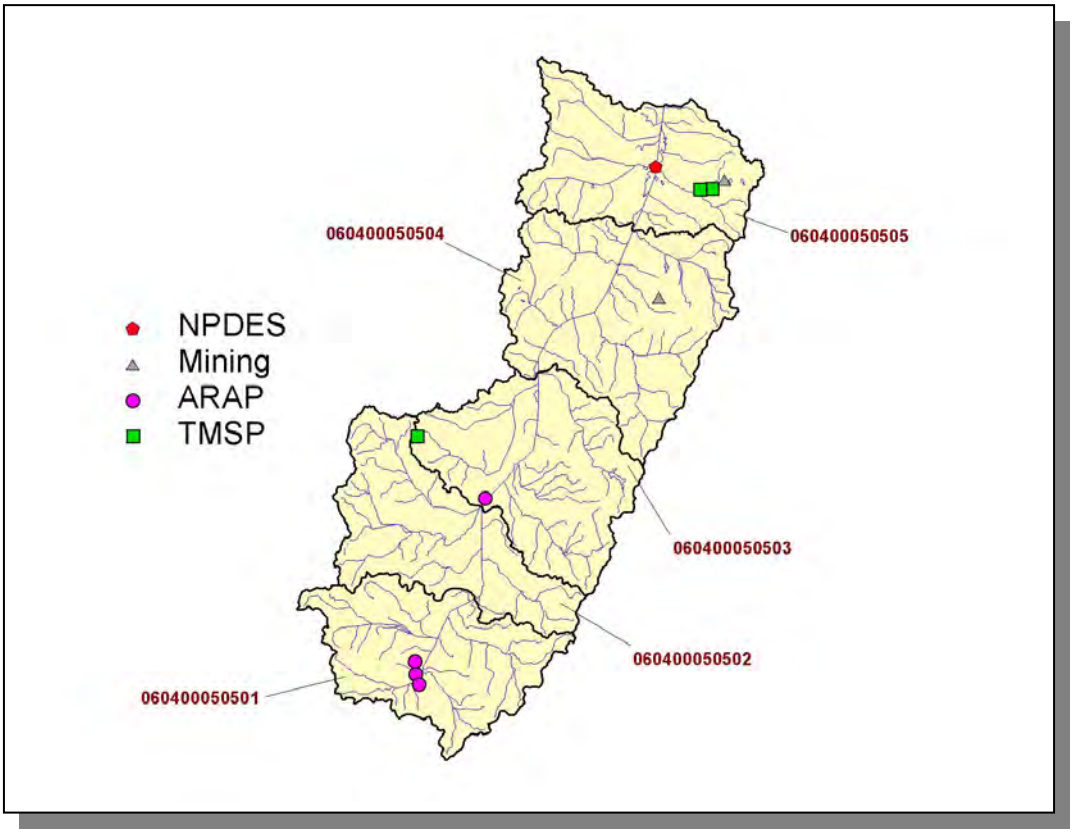


Figure 4-45. Location of Active Point Source Facilities in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504, and 060400050505 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-46. Location of NPDES Facilities in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504, and 060400050505 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-47. Location of Active Mining Facilities in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504, and 060400050505 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

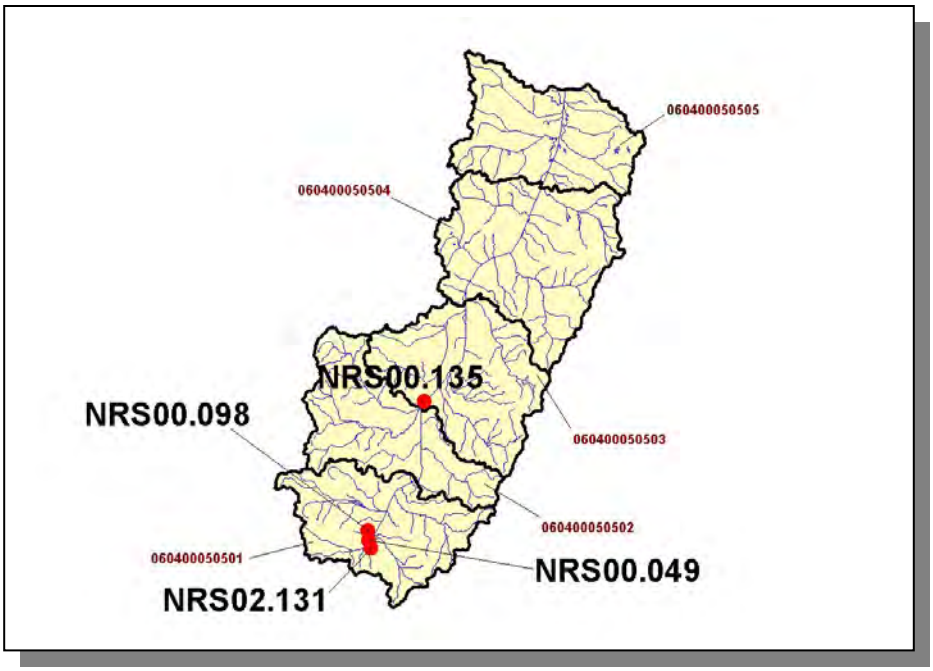


Figure 4-48. Location of ARAP Sites (Individual Permits) in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504, and 060400050505 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

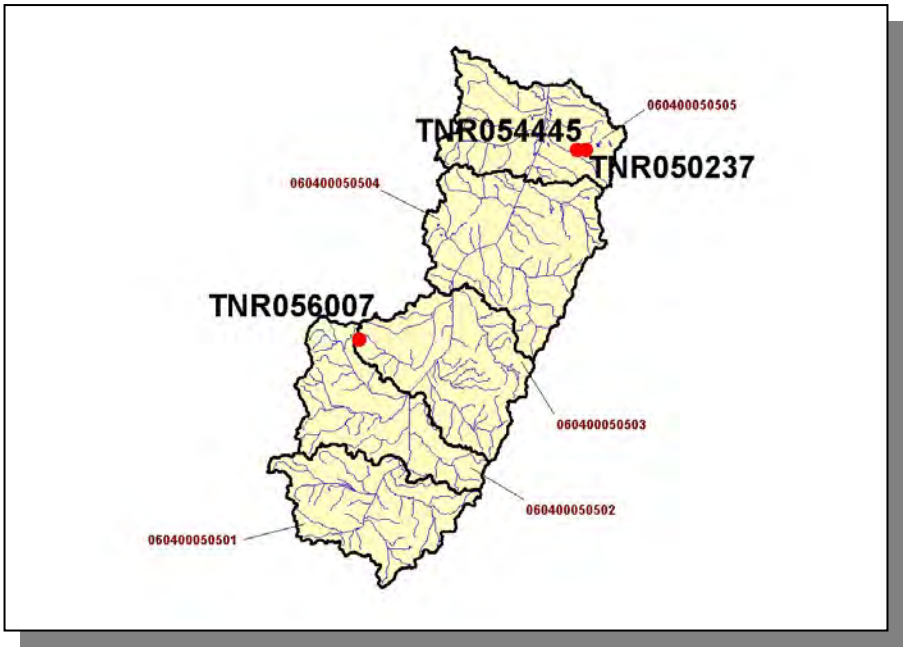


Figure 4-49. Location of TMSP Facilities in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504, and 060400050505 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

4.2.E.ii.a. Dischargers to Water Bodies Listed on the 2002 303(d) List

There is one NPDES facility discharging to water bodies listed on the 2002 303(d) list in Subwatershed 0604000505:

- TN0062014 (Bruceton Wastewater Lagoon) discharges to Big Sandy River @ RM 31.0

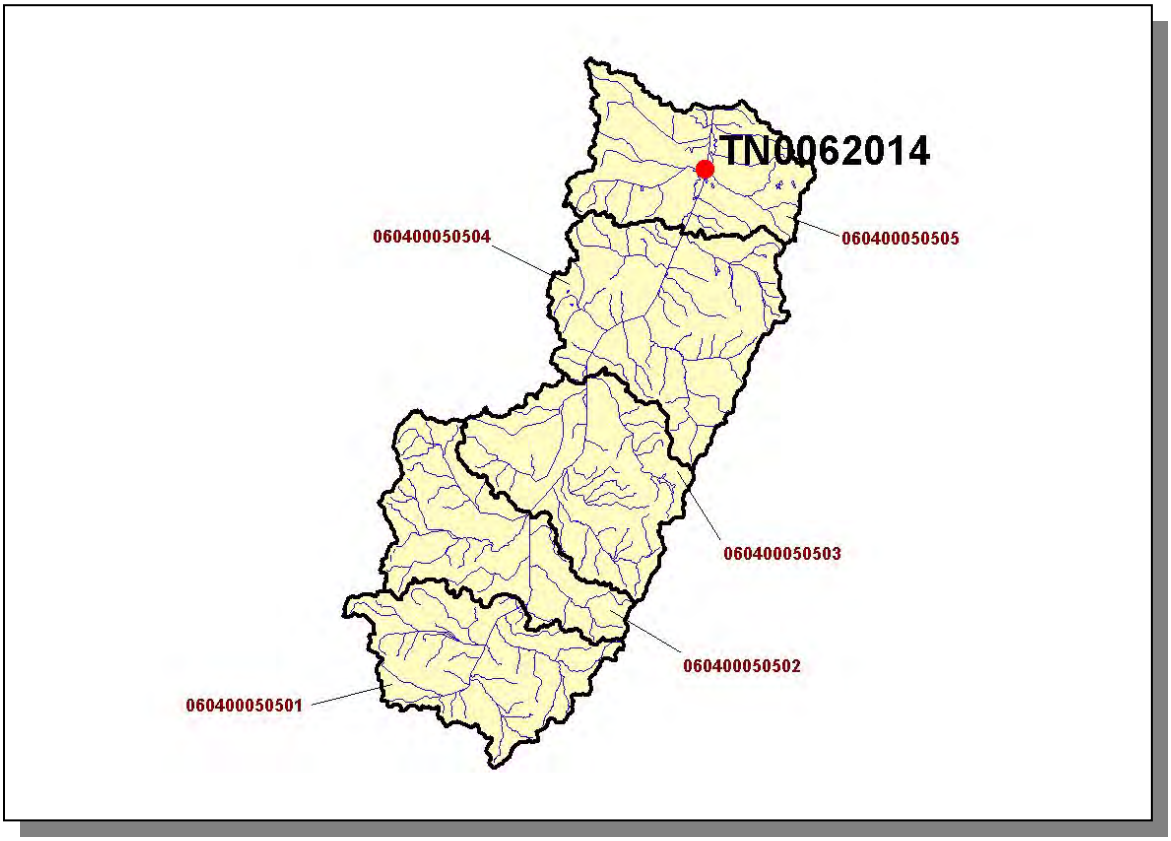


Figure 4-50. Location of NPDES Dischargers to Water Bodies Listed on the 2002 303(d) List in Subwatershed 0604000505. *Subwatershed 060400050501, 060400050502, 060400050503, 060400050504, and 060400050505 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

PERMIT #	1Q10	3Q10	7Q10	3Q20	QDESIGN
TN0062014	4.28	4.44	4.68	3.94	0.572

Table 4-28. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies Listed on the 2002 303(d) List in Subwatershed 0604000505. *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 #	WET	$CBOD_5$	FECAL COLIFORM	*E. COLI*	TRC	TSS	SETTLEABLE SOLIDS	DO	pH
TN0062014	X	X	X	X	X	X	X	X	X

Table 4-29. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2002 303(d) List in Subwatershed 0604000505. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

4.2.E.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Milk Cow	Cattle	Chickens (Layers)	Chickens Sold	Hogs	Sheep
7,313	109	15,096	16	<5	4,932	56

Table 4-30. Summary of Livestock Count Estimates in Subwatershed 0604000505. *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)
Benton	172.7	172.7	2.1	6.9
Carroll	169.1	169.1	0.6	2.0
Henderson	158.5	158.5	3.6	12.8
Totals	**500.3**	**500.3**	**6.3**	**21.7**

Table 4-31. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 0604000505.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.52
Grass (Hayland)	0.16
Legumes (Hayland)	0.15
Legumes, Grass (Hayland)	0.42
Grass, Forbs, Legumes (Mixed Pasture)	0.80
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	6.05
Cotton (Row Crops)	6.82
Soybeans (Row Crops)	8.29
Wheat (Close Grown Cropland)	18.50
Other Cropland not Planted	7.73
Conservation Reserve Program Lands	0.87
Other Land in Farms	0.59
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.85

Table 4-32. Annual Estimated Soil Loss in Subwatershed 0604000505.

4.2.F. 0604000506 (Big Sandy River).

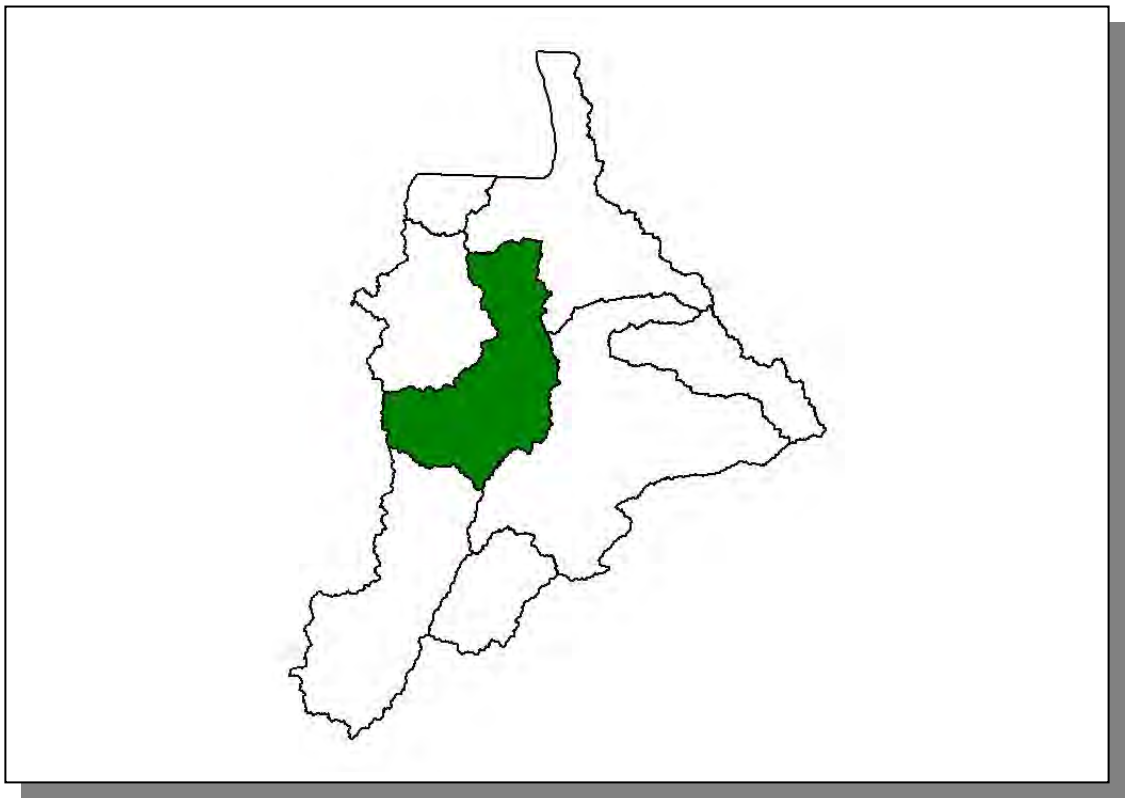


Figure 4-51. Location of Subwatershed 0604000506. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.F.i. General Description.

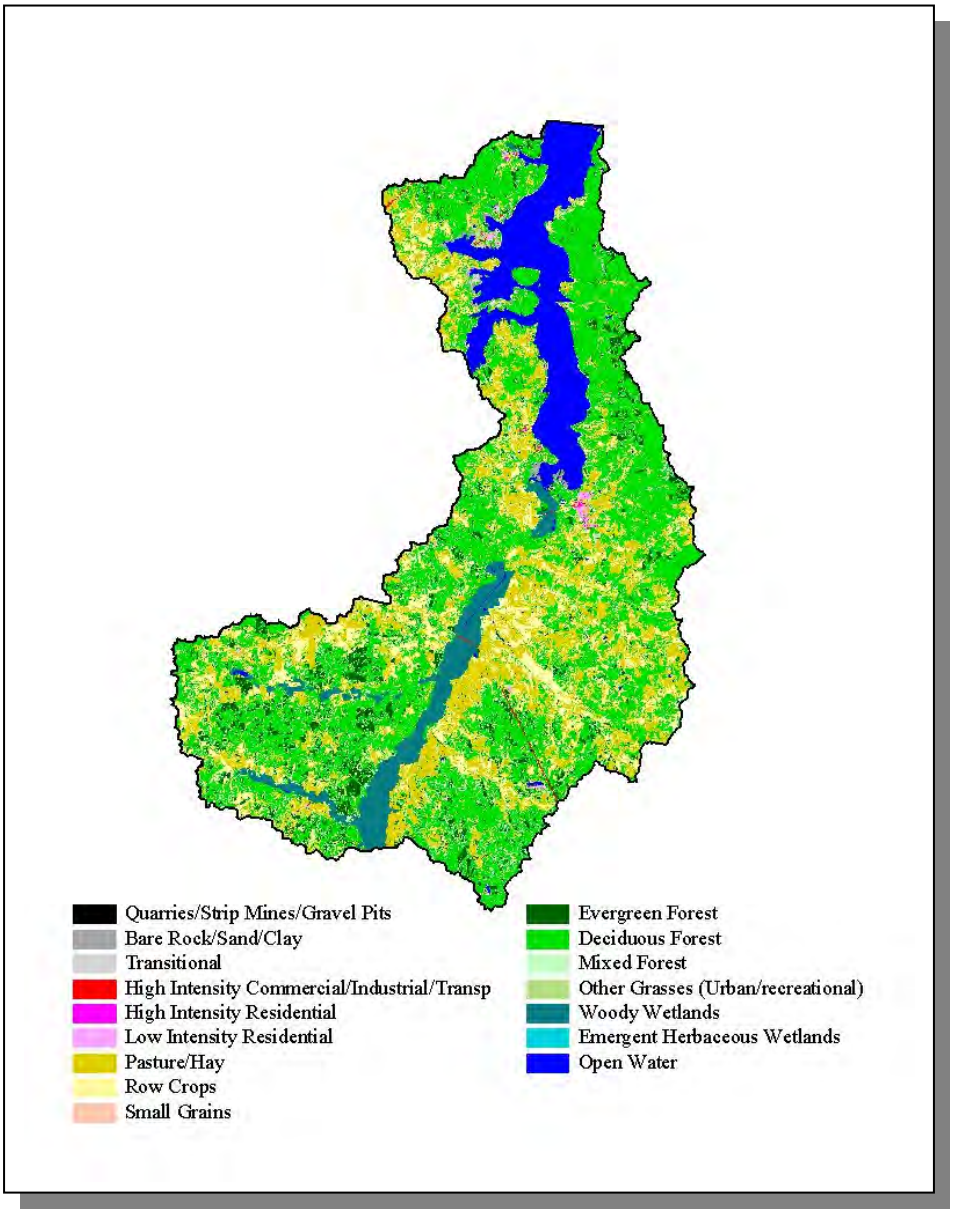


Figure 4-52. Illustration of Land Use Distribution in Subwatershed 0604000506.

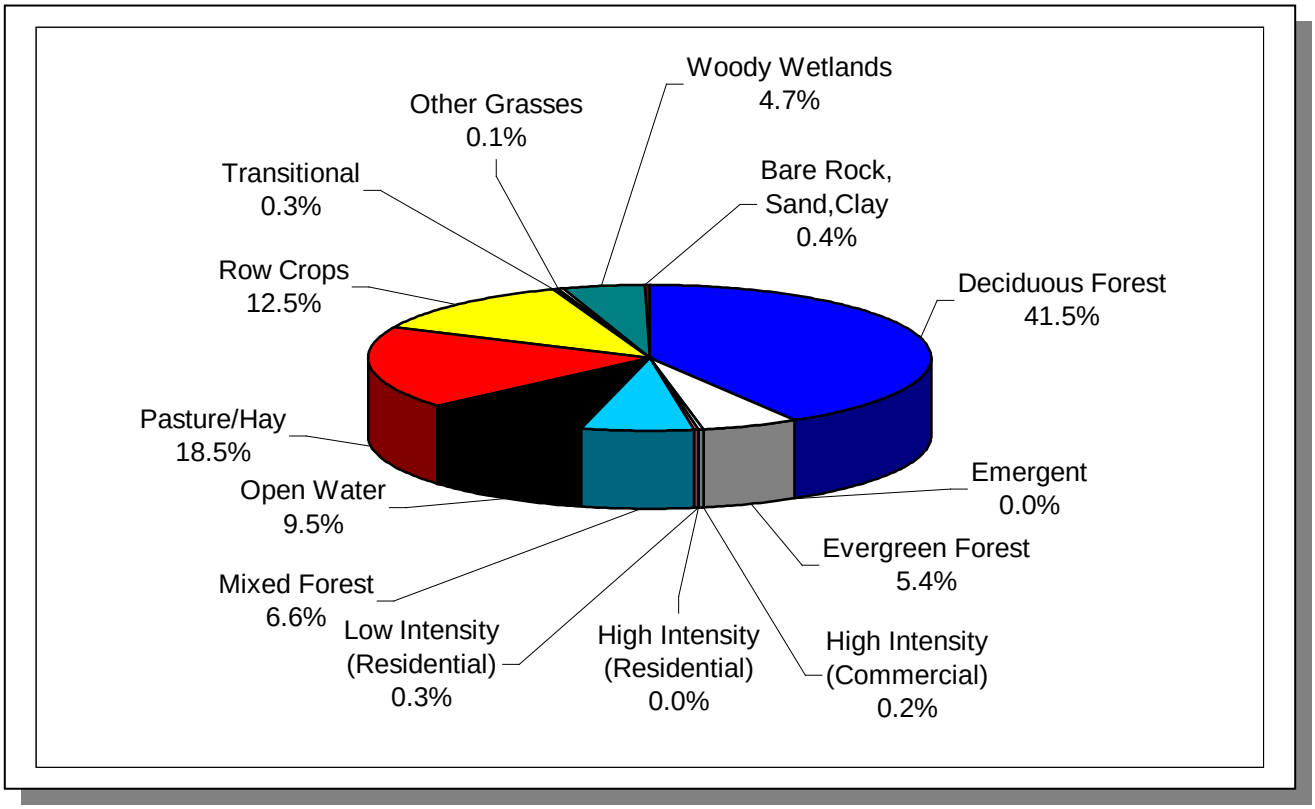


Figure 4-53. Land Use Distribution in Subwatershed 0604000506. *More information is provided in Appendix IV.*

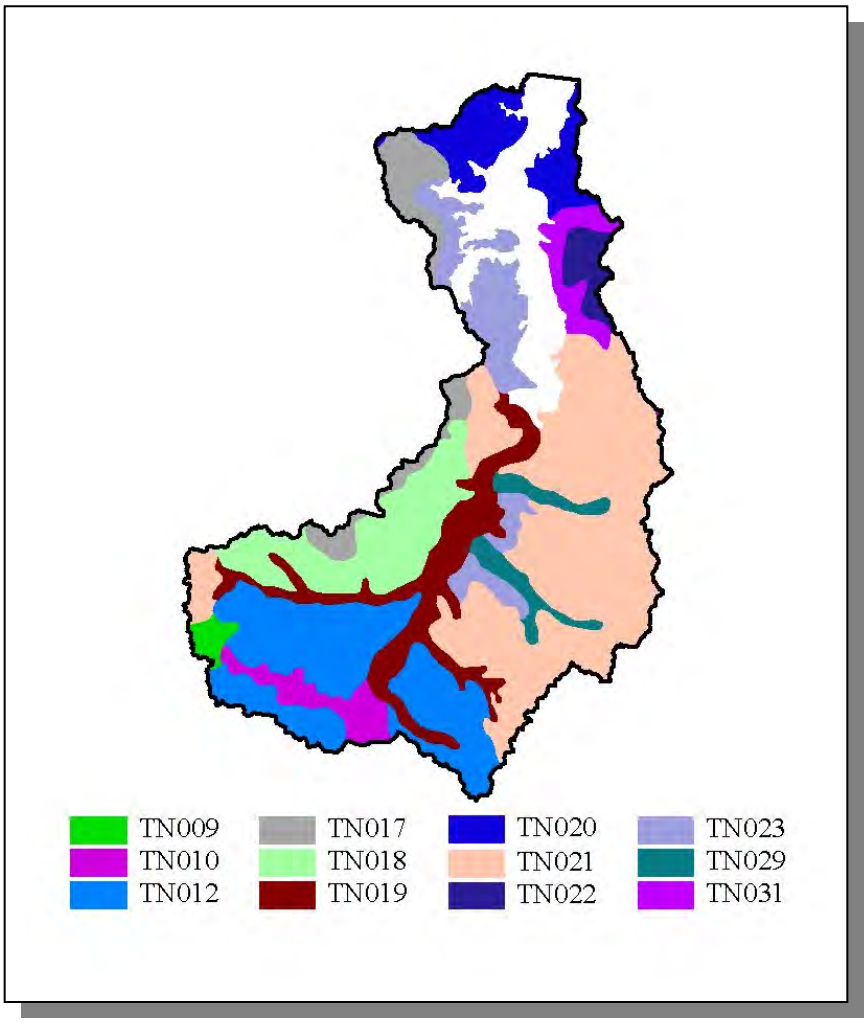


Figure 4-54. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000506.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN009	14.00	C	1.30	5.10	Silty Loam	0.43
TN010	243.00	C	1.33	5.11	Silty Loam	0.44
TN012	3.00	C	2.52	5.13	Silty Loam	0.39
TN017	0.00	B	1.81	5.26	Silty Loam	0.45
TN018	8.00	B	2.62	5.10	Loam	0.38
TN019	186.00	C	1.54	4.76	Loam	0.26
TN020	0.00	C	1.57	5.11	Silty Loam	0.40
TN021	15.00	C	1.30	5.00	Silty Loam	0.43
TN022	20.00	C	1.98	5.07	Loam	0.37
TN023	51.00	C	1.35	5.12	Silty Loam	0.42
TN029	32.00	C	2.96	5.40	Loam	0.33
TN031	0.00	C	3.27	4.88	Loam	0.33

Table 4-33. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000506. *More information is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Benton	14,524	16,243	16,537	23.4	3,410	3,814	3,883	13.9
Carroll	27,514	28,990	29,475	4.15	1,143	1,204	1,225	7.2
Henry	27,888	29,830	31,115	14.58	4,067	4,350	4,537	11.6
Totals	**69,926**	**75,063**	**77,127**		**8,620**	**9,368**	**9,645**	**11.9**

Table 4-34. Population Estimates in Subwatershed 0604000506.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Big Sandy	Benton	518	307	253	54	0
Camden	Benton	3,643	1,667	1,422	245	0
Totals		**4,161**	**1,974**	**1,675**	**299**	**0**

Table 4-35. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0604000506.

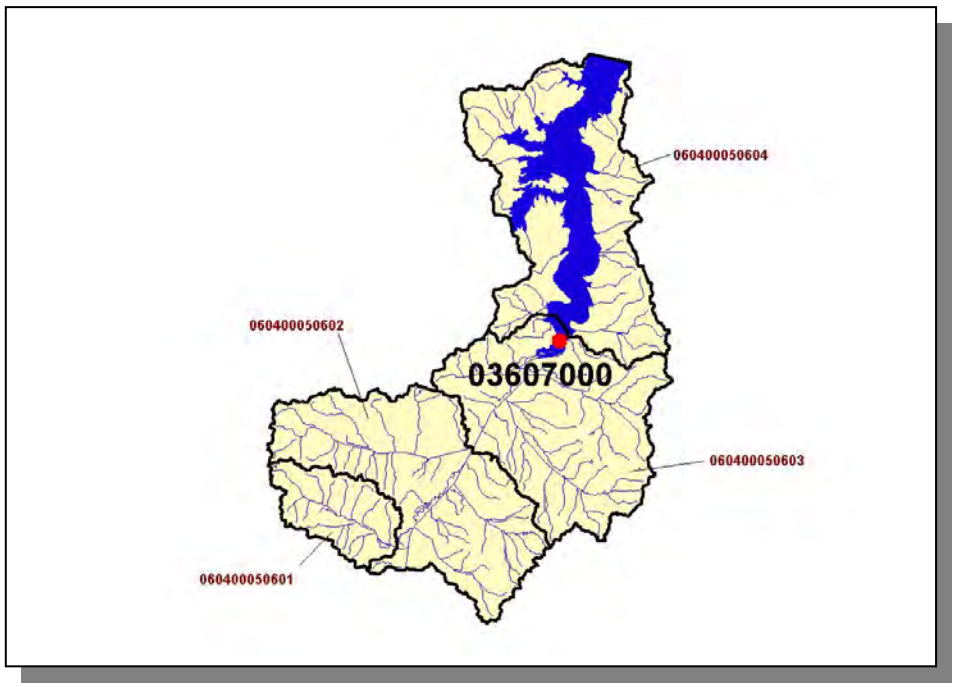


Figure 4-55. Location of Historical Streamflow Data Collection Sites in Subwatershed 0604000506. *Subwatershed 060400050601, 060400050602, and 060400050603 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

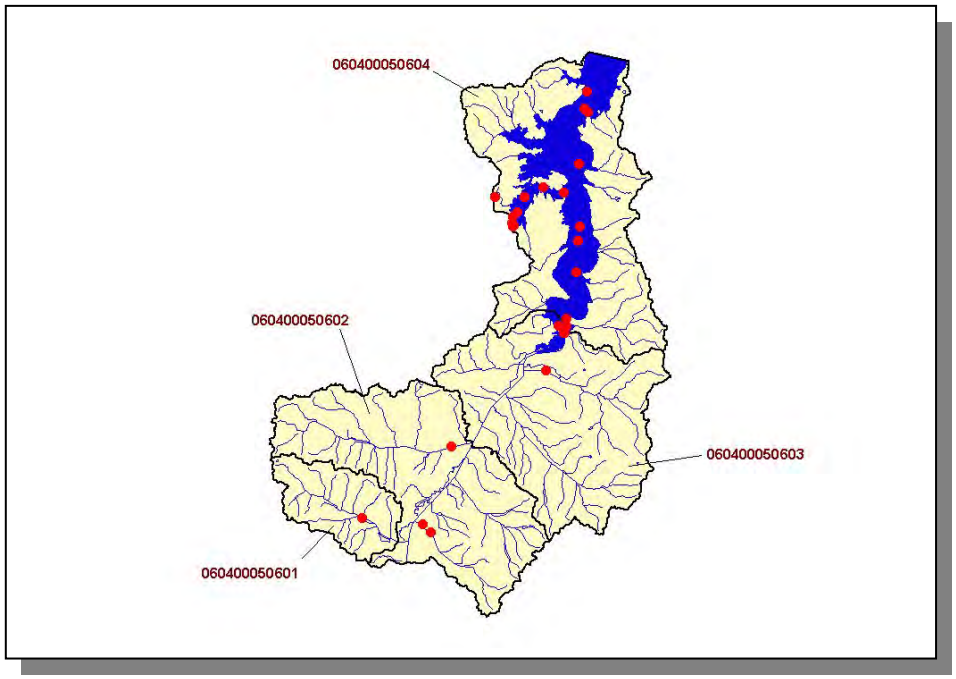


Figure 4-56. Location of STORET Monitoring Sites in Subwatershed 0604000506. *Subwatershed 060400050601, 060400050602, and 060400050603 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

4.2.F.ii. Point Source Contributions.

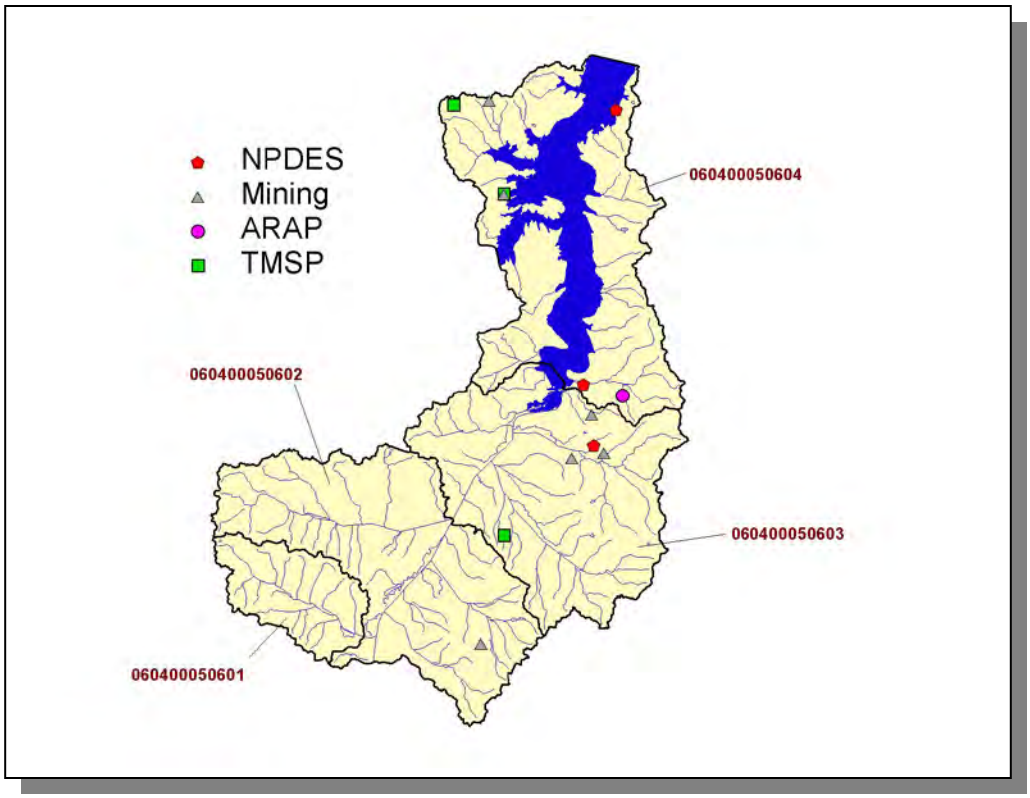


Figure 4-57. Location of Active Point Source Facilities in Subwatershed 0604000506. *Subwatershed 060400050601, 060400050602, 060400050603, and 060400050604 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

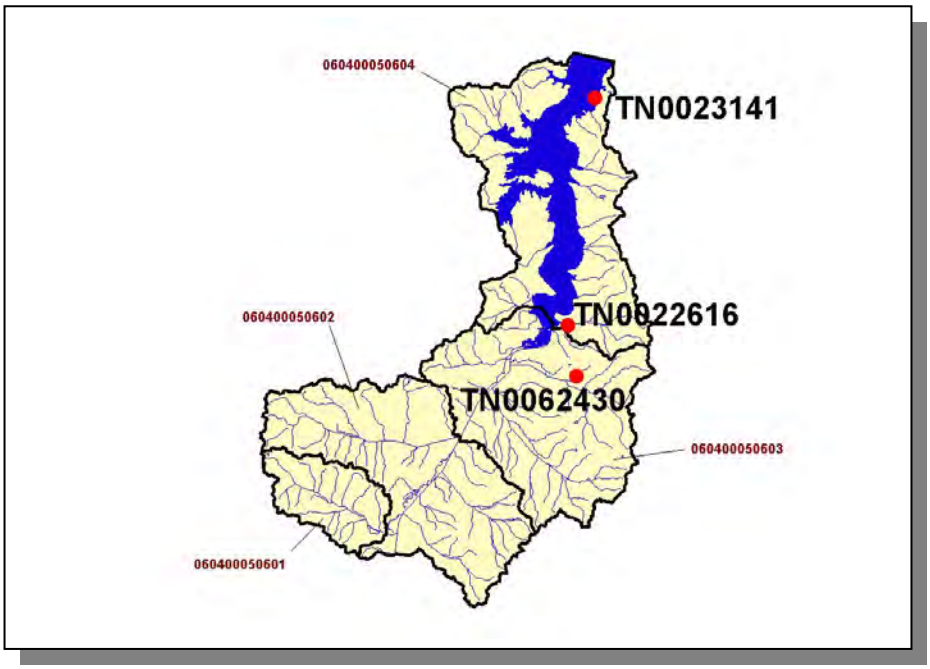


Figure 4-58. Location of NPDES Facilities in Subwatershed 0604000506. *Subwatershed 060400050601, 060400050602, 060400050603, and 060400050604 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

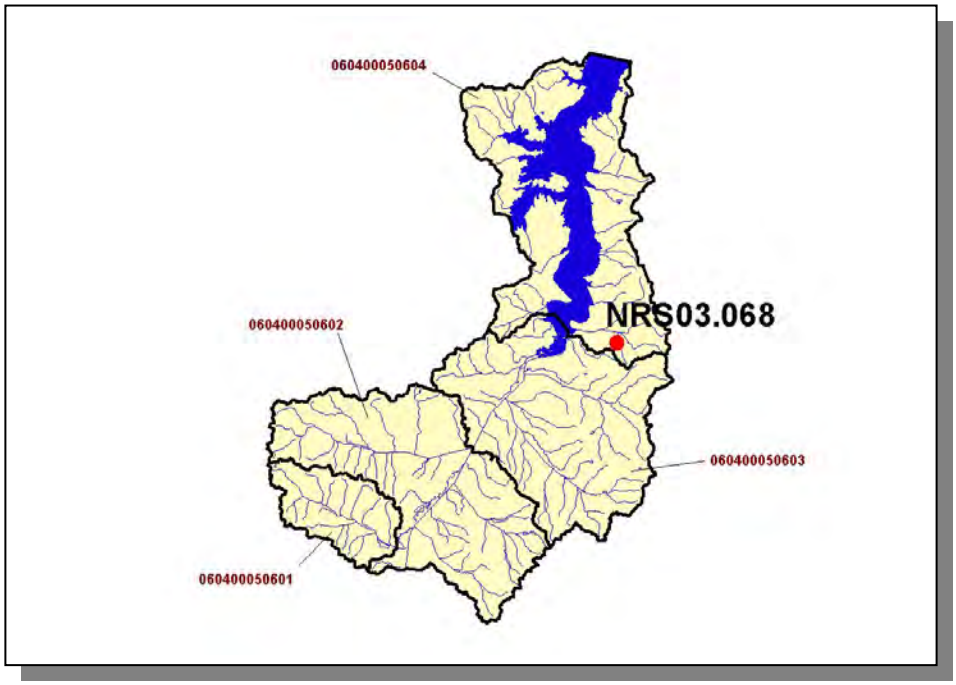


Figure 4-59. Location of ARAP Sites (Individual Permits) in Subwatershed 0604000506. *Subwatershed 060400050601, 060400050602, 060400050603, and 060400050604 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV*

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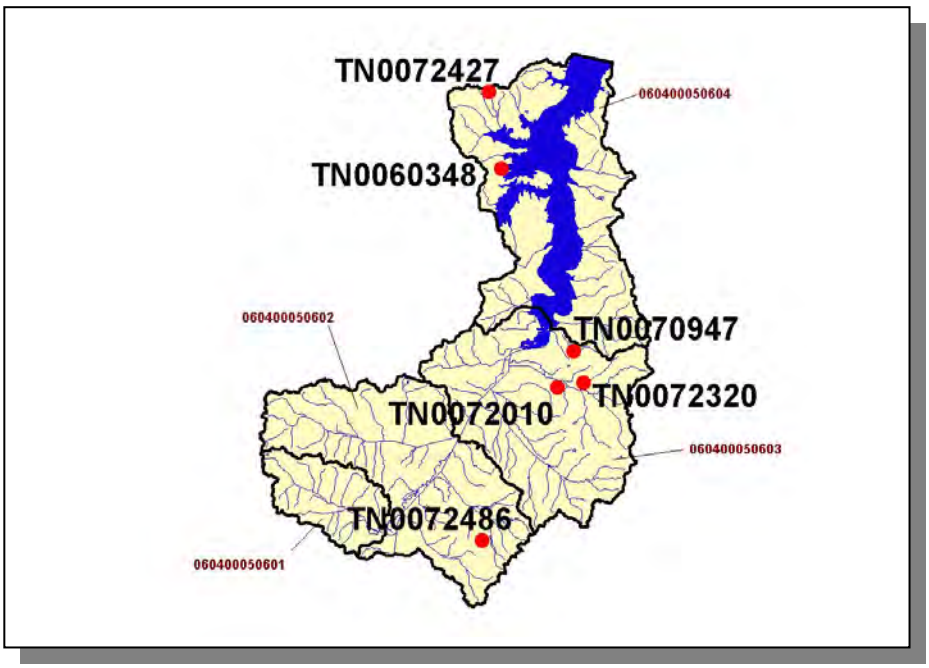


Figure 4-60. Location of Active Mining Facilities in Subwatershed 0604000506. *Subwatershed 060400050601, 060400050602, 060400050603, and 060400050604 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

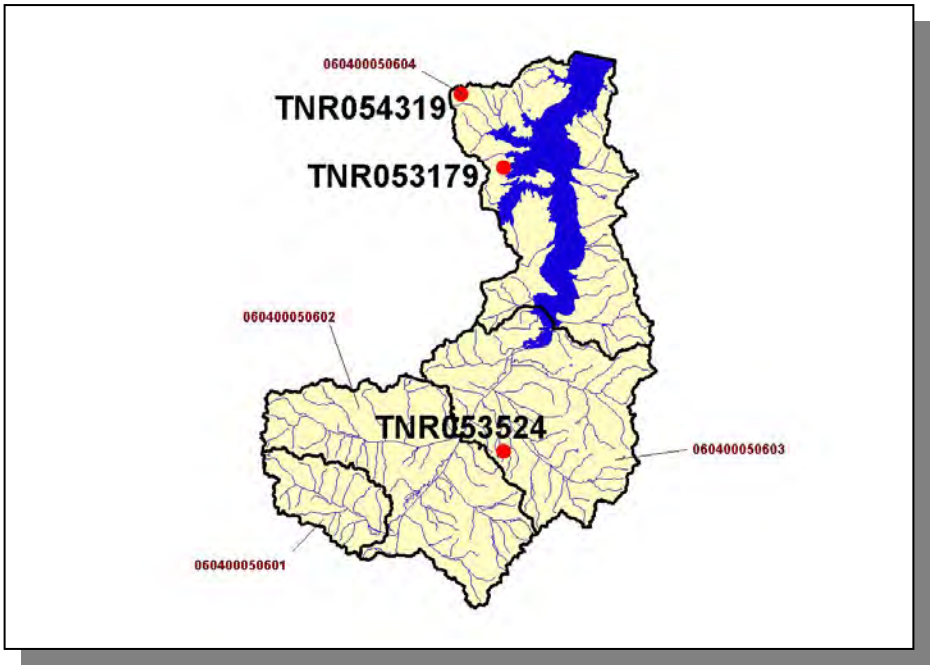


Figure 4-61. Location of TMSP Facilities in Subwatershed 0604000506. *Subwatershed 060400050601, 060400050602, 060400050603, and 060400050604 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

4.2.F.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Milk Cow	Cattle	Chickens (Layers)	Chickens Sold	Hogs	Sheep
3,846	189	7,755	16	<5	4,545	8

Table 4-36. Summary of Livestock Count Estimates in Subwatershed 0604000506. *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)
Benton	172.7	172.7	2.1	6.9
Carroll	169.1	169.1	0.6	2.0
Henry	176.1	176.1	1.9	7.1
Total	**517.9**	**517.9**	**4.6**	**16.0**

Table 4-37. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0604000506.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.29
Grass (Hayland)	0.24
Legumes (Hayland)	0.47
Legumes, Grass (Hayland)	0.19
Grass, Forbs, Legumes (Mixed Pasture)	0.34
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	5.73
Cotton (Row Crops)	7.58
Soybeans (Row Crops)	5.34
Wheat (Close Grown Cropland)	8.82
Other (Horticultural)	16.41
Other Cropland not Planted	2.48
Nonagricultural Land Use	0.00
Conservation Reserve Program Lands	0.52
Other Land in Farms	0.59
Farmsteads and Ranch Headquarters	0.37

Table 4-38. Annual Estimated Total Soil Loss in Subwatershed 0604000506.

4.2.G. 0604000507 (West Sandy Creek).

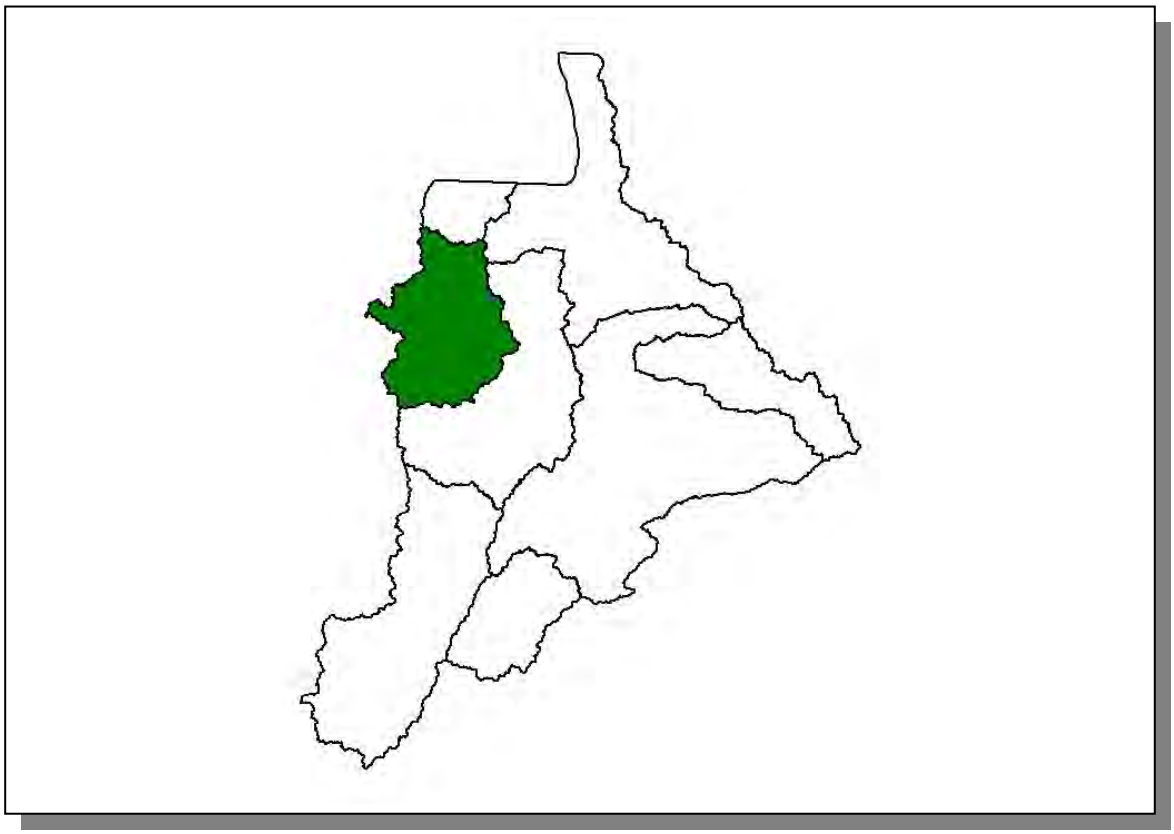


Figure 4-62. Location of Subwatershed 0604000507. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.G.i. General Description.

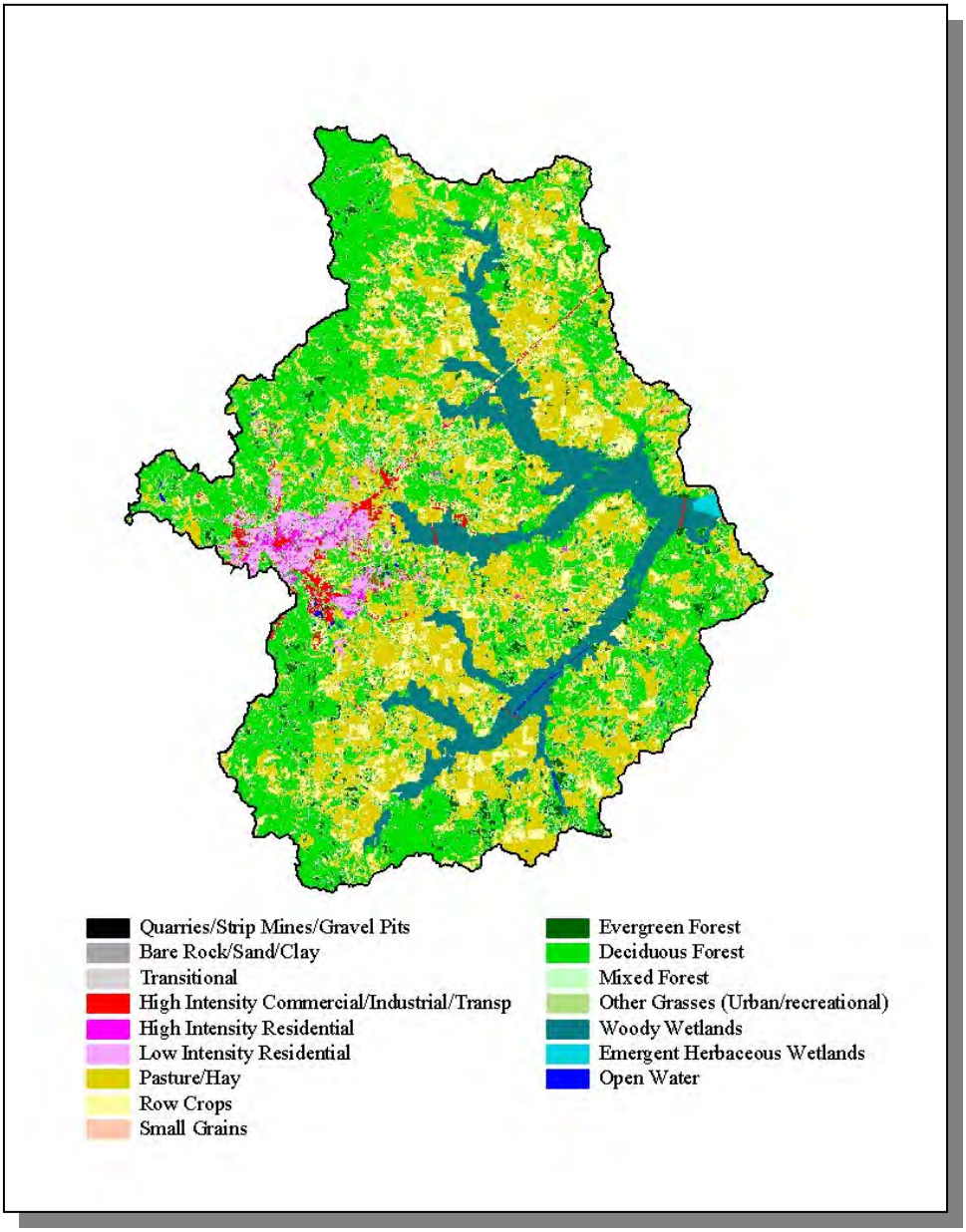


Figure 4-63. Illustration of Land Use Distribution in Subwatershed 0604000507.

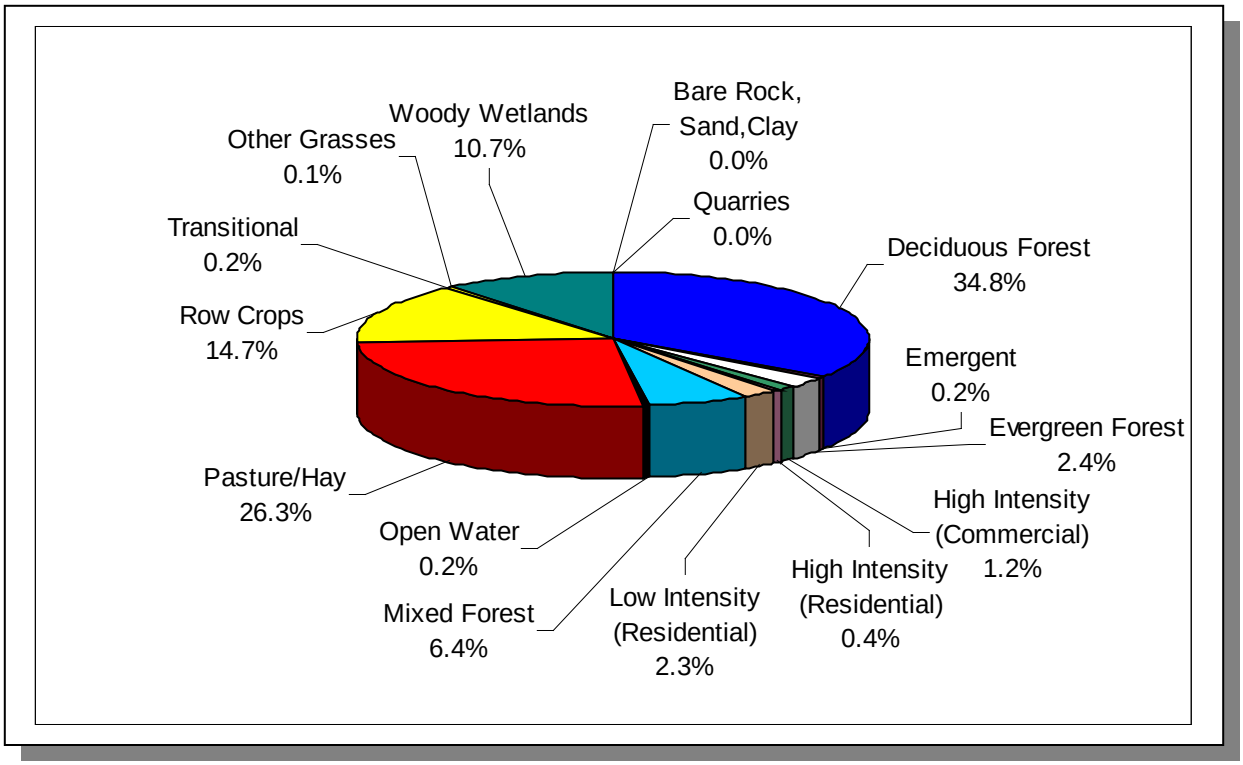


Figure 4-64. Land Use Distribution in Subwatershed 0604000507. *More information is provided in Appendix IV.*

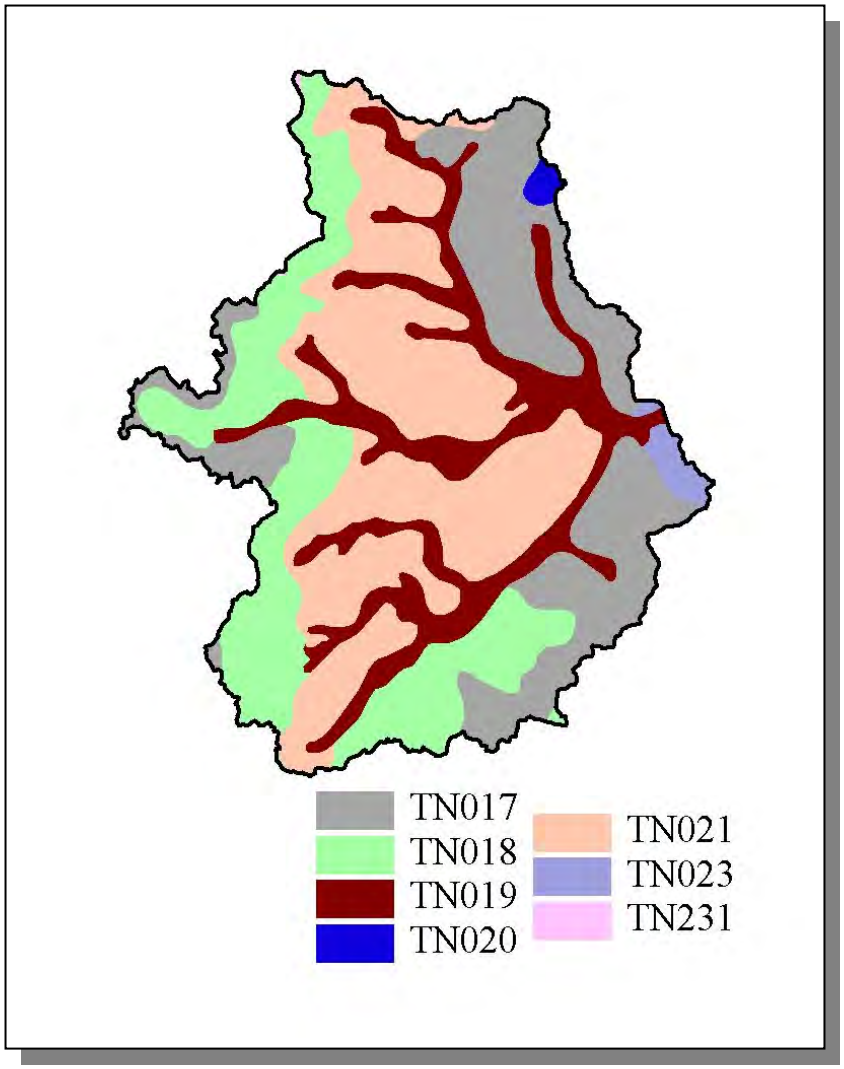


Figure 4-65. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000507.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN017	0.00	B	1.81	5.26	Silty Loam	0.45
TN018	8.00	B	2.62	5.10	Loam	0.38
TN019	186.00	C	1.54	4.76	Loam	0.26
TN020	0.00	C	1.57	5.11	Silty Loam	0.40
TN021	15.00	C	1.30	5.00	Silty Loam	0.43
TN023	51.00	C	1.35	5.12	Silty Loam	0.42
TN231	16.00	C	1.30	5.21	Silty Loam	0.48

Table 4-39. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000507. *More information is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Henry	27,888	29,830	31,115	24.2	6,759	7,230	7,541	11.6

Table 4-40. Population Estimates in Subwatershed 0604000507.

NUMBER OF HOUSING UNITS						
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Paris	Henry	9,332	4,538	4,382	151	5

Table 4-41. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0604000507.

Figure 4-66. Location of Historical Streamflow Data Collection Sites in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information is provided in Appendix IV.*

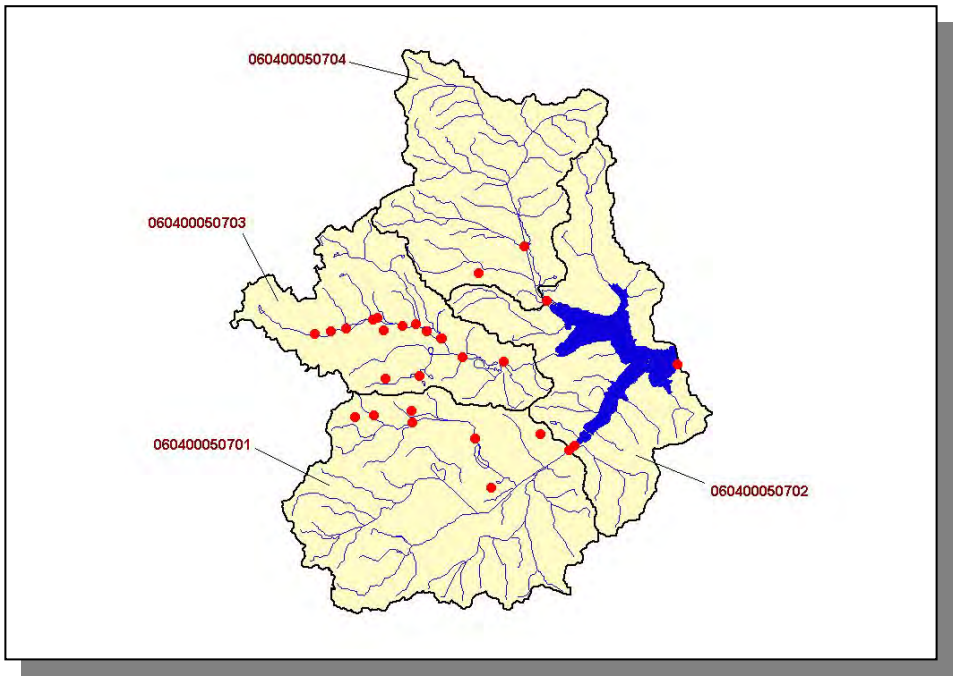


Figure 4-67. Location of STORET Monitoring Sites in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information, including site names and locations, is provided in Appendix IV.*

4.2.G.ii. Point Source Contributions.

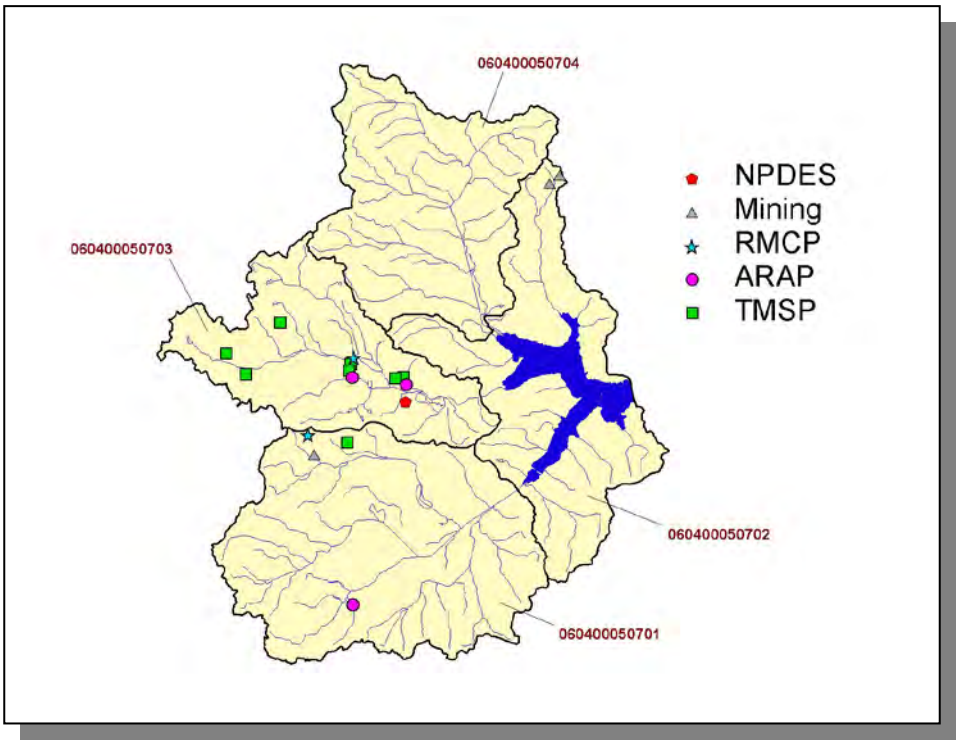


Figure 4-68. Location of Active Point Source Facilities in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-69. Location of NPDES Facilities in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

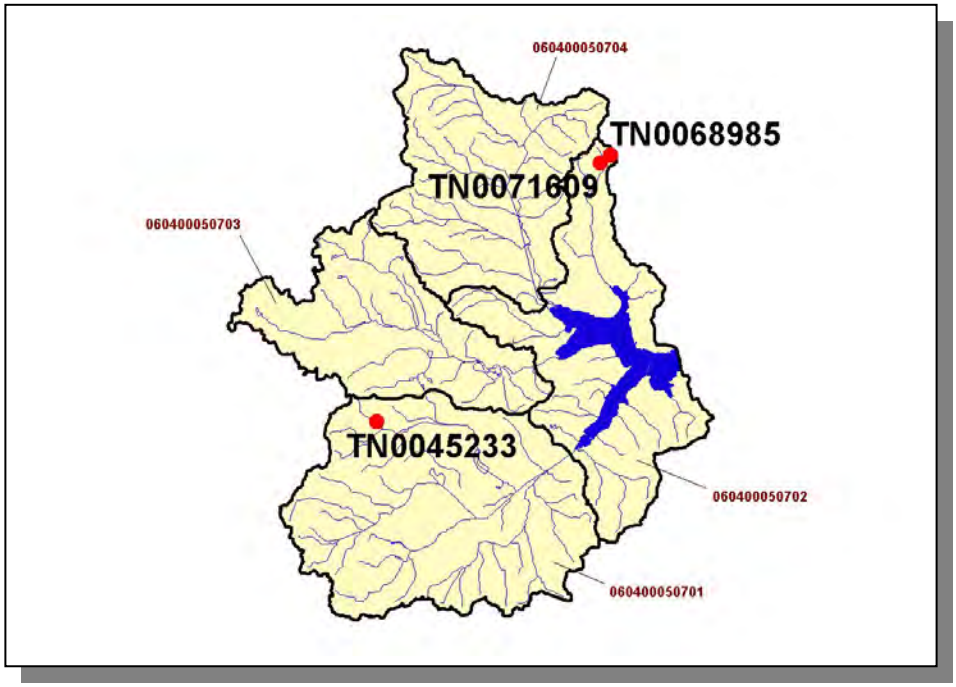


Figure 4-70. Location of Active Mining Facilities in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

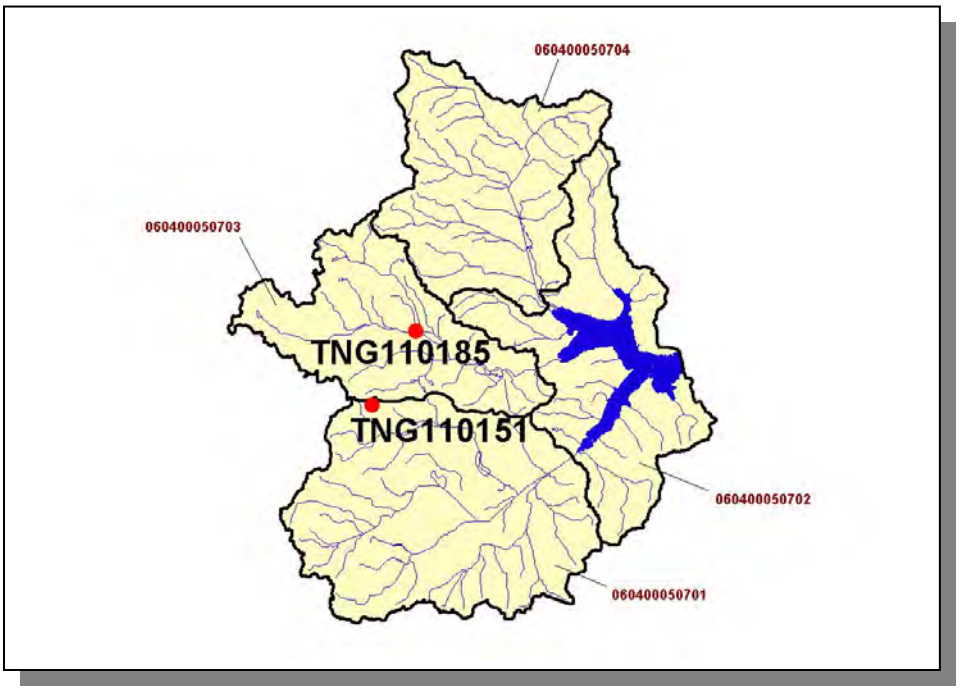


Figure 4-71. Location of Ready Mix Concrete Plants in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

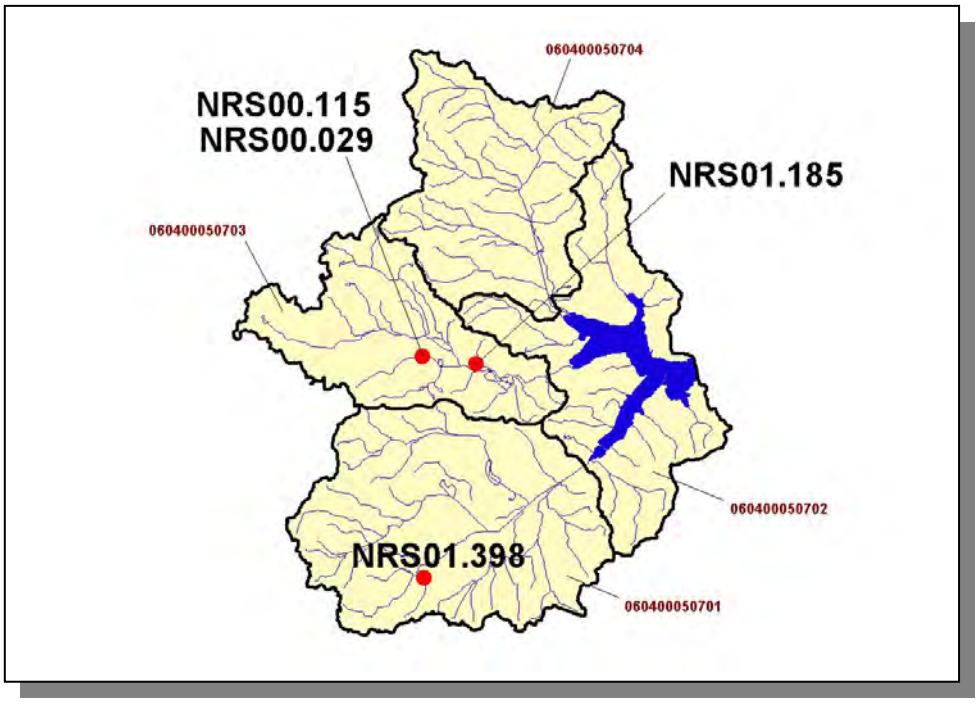


Figure 4-72. Location of ARAP Sites (Individual Permits) in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

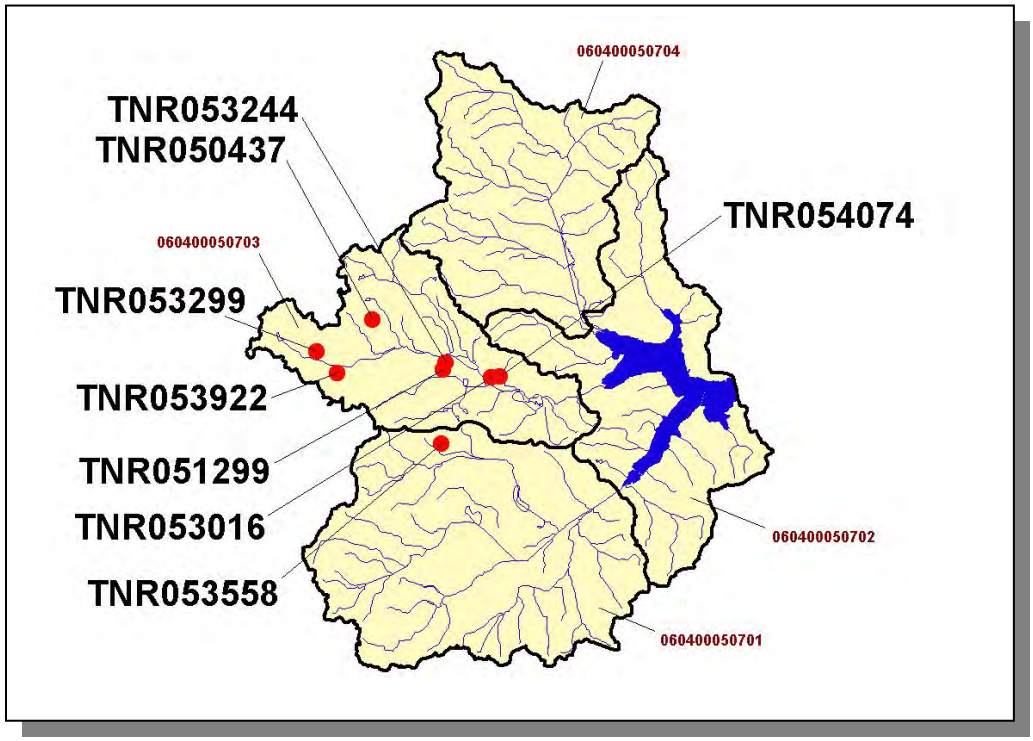


Figure 4-73. Location of TMSP Facilities in Subwatershed 0604000507. *Subwatershed 060400050701, 060400050702, 060400050703, and 060400050704 boundaries are shown for reference. More information, including the names of facilities, is provided in Appendix IV.*

4.2.G.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens Sold	Hogs	Sheep
2,201	5,008	442	7	<5	8,932	22

Table 4-42. Summary of Livestock Count Estimates in Subwatershed 0604000507. *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)
Henry	176.1	176.1	1.9	7.1

Table 4-43. Forest Acreage and Average Removal Rates (1987-1994) in Subwatershed 0604000507.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.25
Grass (Hayland)	0.25
Legumes, Grass (Hayland)	0.11
Grass, Forbs, Legumes (Mixed Pasture)	0.52
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	7.72
Soybeans (Row Crops)	6.38
Wheat (Close Grown Cropland)	6.02
Other (Horticultural)	16.41
Other Cropland not Planted	2.61
Conservation Reserve Program Lands	0.57
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.10

Table 4-44. Annual Estimated Total Soil Loss in Subwatershed 0604000507.

4.2.H. 0604000508 (Blood River).

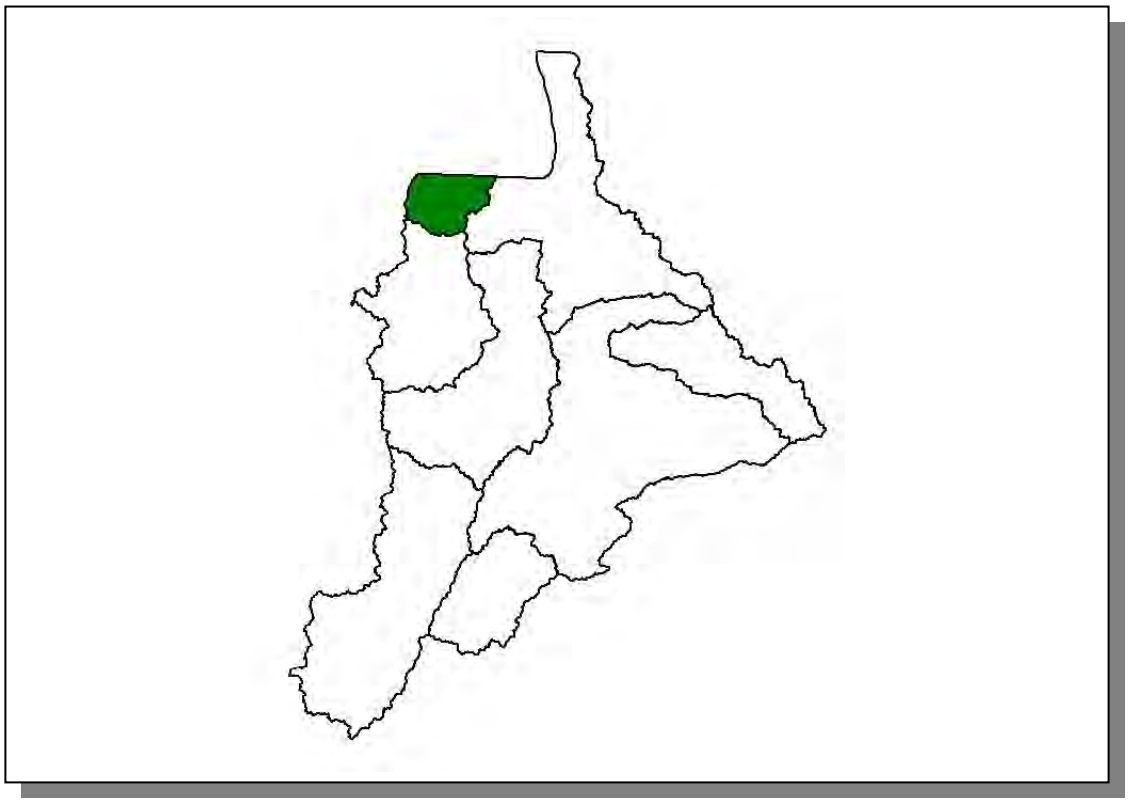


Figure 4-74. Location of Subwatershed 0604000508. *All Tennessee Western Valley (KY Lake) HUC-10 subwatershed boundaries in Tennessee are shown for reference.*

4.2.H.i. General Description.

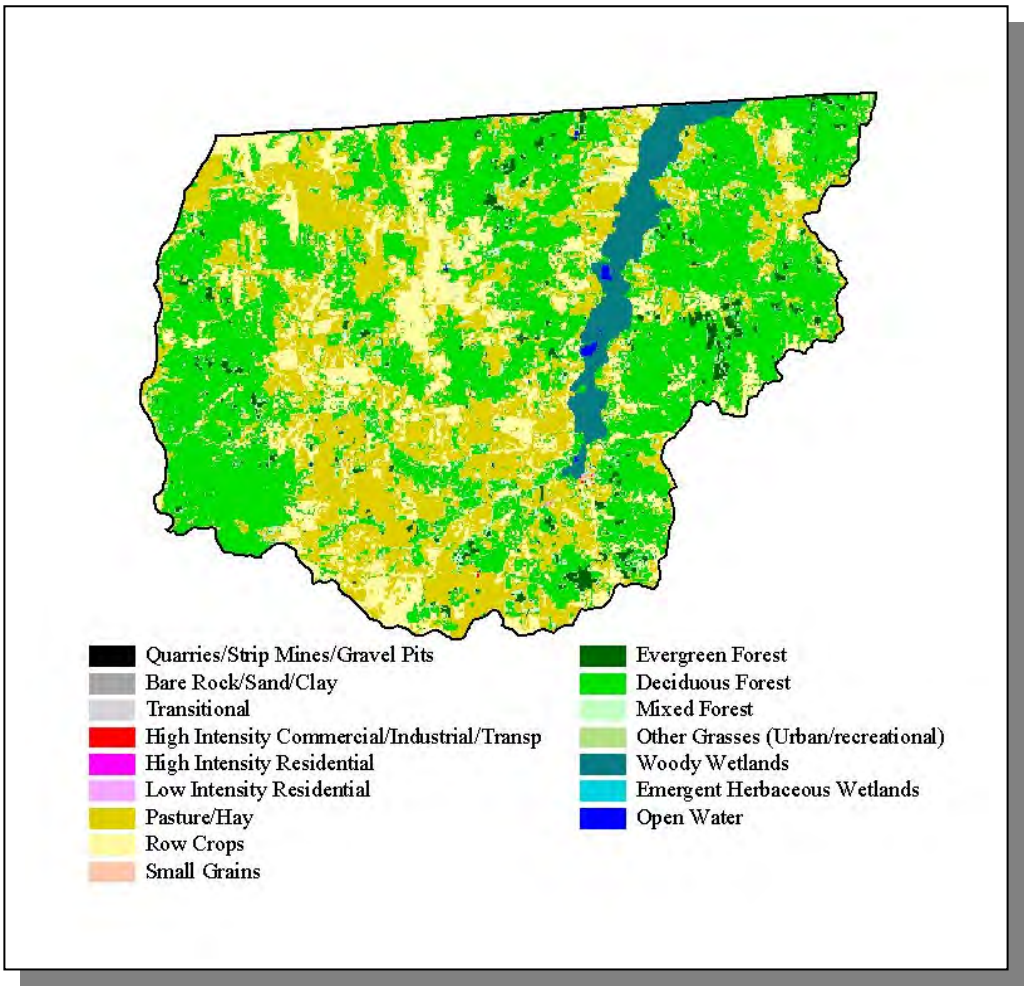


Figure 4-75. Illustration of Land Use Distribution in Subwatershed 0604000508.

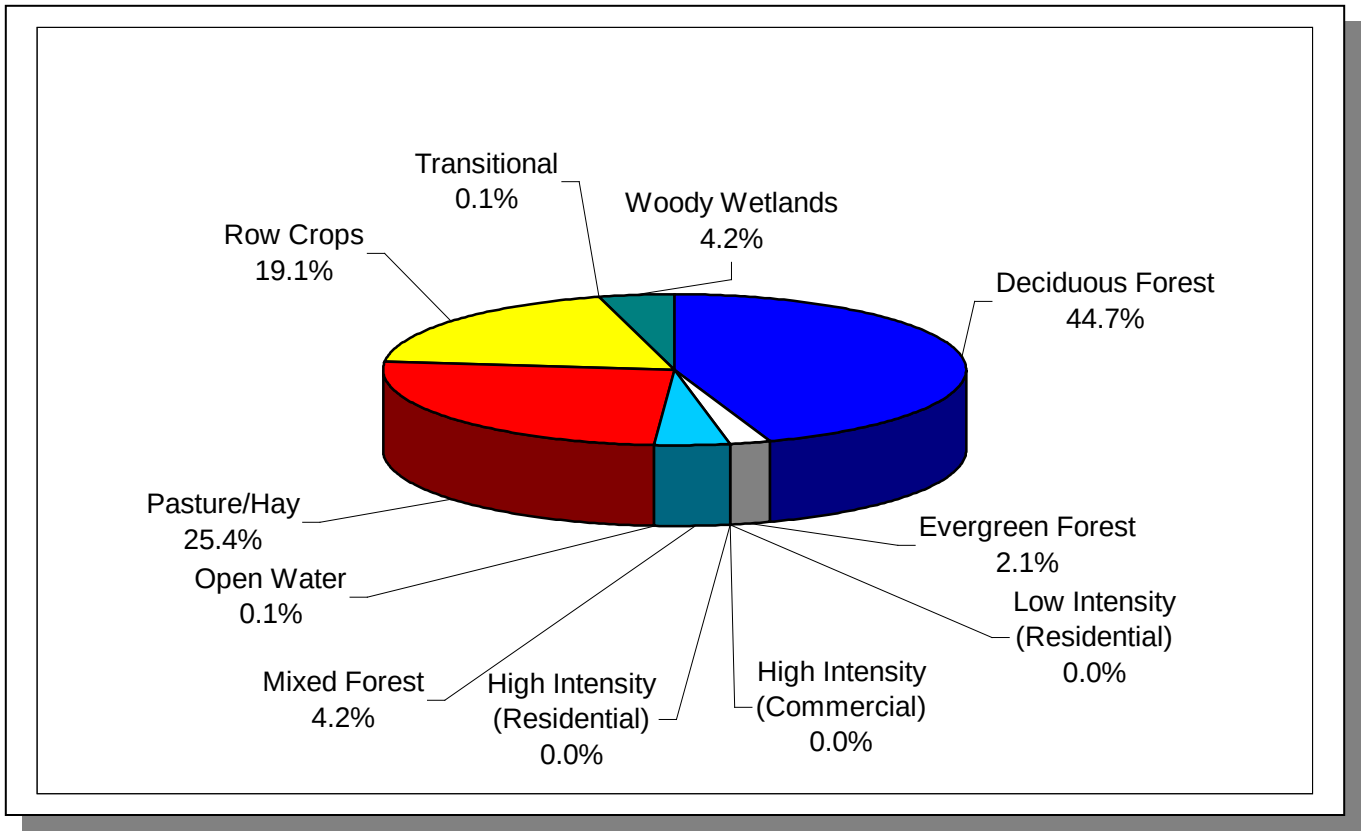


Figure 4-76. Land Use Distribution in Subwatershed 0604000508. *More information is provided in Appendix IV.*

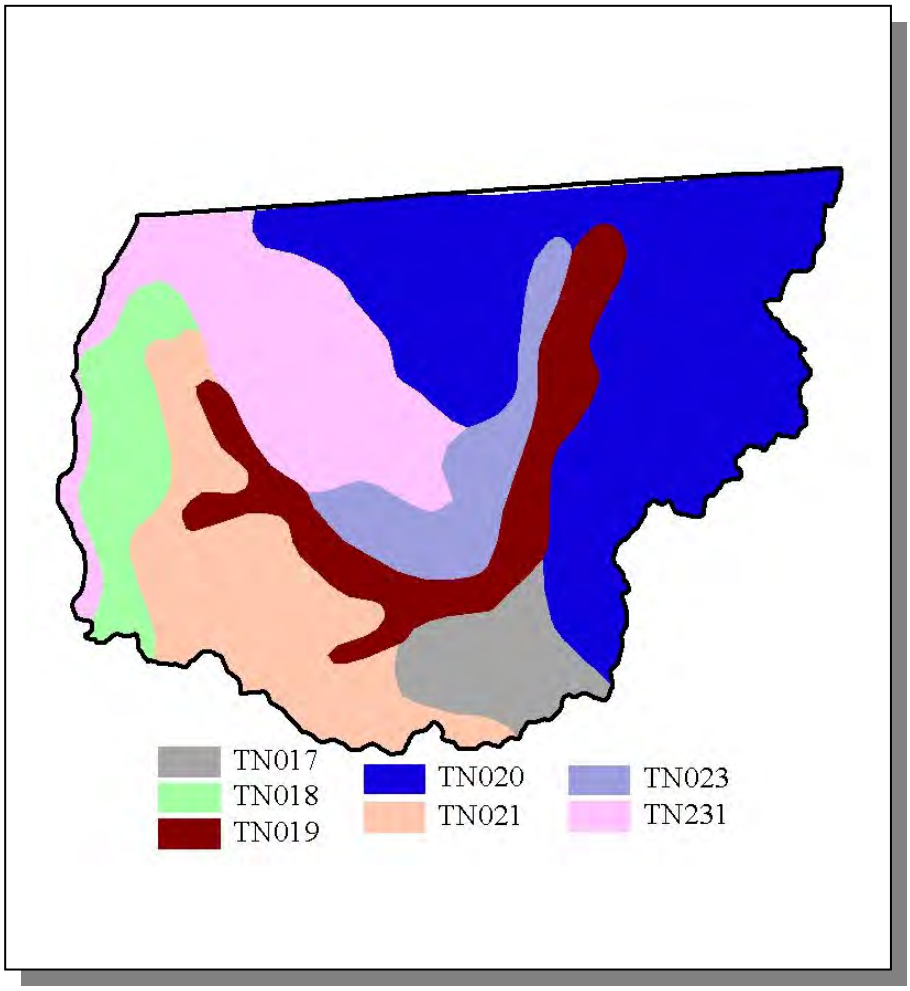


Figure 4-77. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000508.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN017	0.00	B	1.81	5.26	Silty Loam	0.45
TN018	8.00	B	2.62	5.10	Loam	0.38
TN019	186.00	C	1.54	4.76	Loam	0.26
TN020	0.00	C	1.57	5.11	Silty Loam	0.40
TN021	15.00	C	1.30	5.00	Silty Loam	0.43
TN023	51.00	C	1.35	5.12	Silty Loam	0.42
TN231	16.00	C	1.30	5.21	Silty Loam	0.48

Table 4-45. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0604000508. *More information is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-1997)
Henry	27,888	29,830	31,115	6.57	1,833	1,961	2,045	11.6

Table 4-46. Population Estimates in Subwatershed 0604000508.

4.2.H.ii. Point Source Contributions.

There are no point source contributions in this watershed.

4.2.H.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens Sold	Hogs	Sheep
576	1,310	116	<5	<5	2,337	6

Table 4-47. Summary of Livestock Count Estimates in Subwatershed 0604000508. *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)
Henry	176.1	176.1	1.9	7.1

Table 4-48. Forest Acreage and Average Removal Rates (1987-1994) in Subwatershed 0604000508.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.25
Grass (Hayland)	0.25
Legumes, Grass (Hayland)	0.11
Grass, Forbs, Legumes (Mixed Pasture)	0.52
Forest Land (Not Grazed)	0.00
Forest Land (Grazed)	0.00
Corn (Row Crops)	7.72
Soybeans (Row Crops)	6.38
Wheat (Close Grown Cropland)	6.02
Other (Horticultural)	16.41
Other Cropland not Planted	2.61
Conservation Reserve Program Lands	0.57
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.10

Table 4-49. Annual Estimated Total Soil Loss in Subwatershed 0604000508.

CHAPTER 5

WATER QUALITY PARTNERSHIPS IN THE TENNESSEE WESTERN VALLEY (KY LAKE) 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 Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed. The information presented is provided by the agencies and organizations described.

5.2. FEDERAL PARTNERSHIPS.

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

Performance Results System (PRS) is a Web-based database application providing USDA Natural Resources Conservation Service, conservation partners, and the public fast and easy access to accomplishments and progress toward strategies and performance. The PRS may be viewed at http://prms.nrcs.usda.gov/prs. From the opening menu, select "Reports" in the top tool bar. Next, select "2004 Reports" if it's active, and "2003 PRMS Reports" if it's not. Pick the conservation treatment of interest on the page that comes up and reset the date to 2004 Reports if it is not set there. Pick the conservation practice of interest. In the location drop box of the page that comes up, select "Tennessee" and click on the "Refresh" button. In the "By" drop box that comes up, select "Hydrologic Unit" and click on the "Refresh" button. The report of interest can now be viewed.

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.

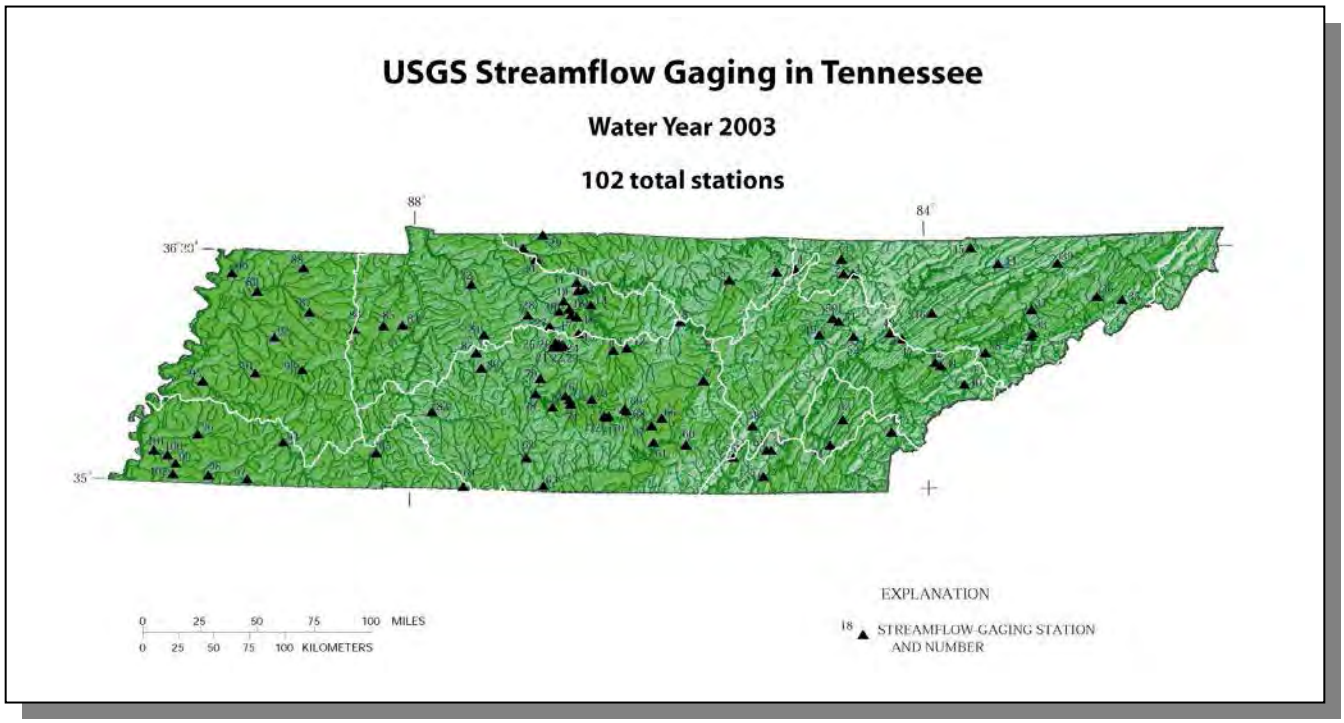
CONSERVATION PRACTICE	TOTAL		
	FEET	ACRES	NUMBER
Comprehensive Nutrient Management Plans		4,539	
Streambank and Shoreline Protection	1,880		
Water Supply	7,990		310
Water Detention/Retention			78
Pest Management		4,182	
Land Treatment: Buffers	1,880	72	
Land Treatment: Surface Water Management	1,200	1	
Grazing/Forages Practices	92,271	3,734	

Table 5-1. Landowner Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period. More information is provided in 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 102 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/). For specific information on the Upper and Lower Tennessee NAWQA studies, please visit http://tn.water.usgs.gov/lten/tenn.html

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. Federally endangered and threatened species in this portion of the Tennessee River watershed include the gray bat (*Myotis grisescens*), bald eagle (*Haliaeetus leucocephalus*), and pink mucket (*Lampsilis abrupta*). For a complete listing of endangered and threatened species in Tennessee, please visit the Service's website at http://www.fws.gov/cookeville/.

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

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

In an effort to preclude the listing of a rare species, the Service engages in proactive conservation efforts for unlisted species. The program covers not only formal candidates

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

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

HOW TO PARTICIPATE

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

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

5.2.D. Tennessee Valley Authority (TVA). The Tennessee Valley Authority's (TVA) goals for the 21st Century are to generate prosperity for the Tennessee Valley by promoting economic development, supplying low-cost, reliable power, and supporting a thriving river system. TVA is committed to the sustainable development of the region and is engaged in a wide range of watershed protection activities. TVA has seven multidisciplinary Watershed Teams to help communities across the Tennessee Valley

actively develop and implement protection and restoration activities in their local watersheds. These teams work in partnership with business, industry, government agencies, and community groups to manage, protect, and improve the quality of the Tennessee River and its tributaries. TVA also operates a comprehensive monitoring program to provide real-time information to the Watershed Teams and other entities about the conditions of these resources.

Further information on TVA's activities in the Tennessee Western valley (KY Lake) Watershed can be obtained by writing the Kentucky Watershed Team at 202 West Blythe St., Paris, TN 38242 or by calling (731)-641-2000.

5.3. STATE PARTNERSHIPS.

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

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

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

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

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

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

assessments were mandated and funded by Congress. Source water protection will be left up to the individual states and local governments without additional authority from Congress for that progression.

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

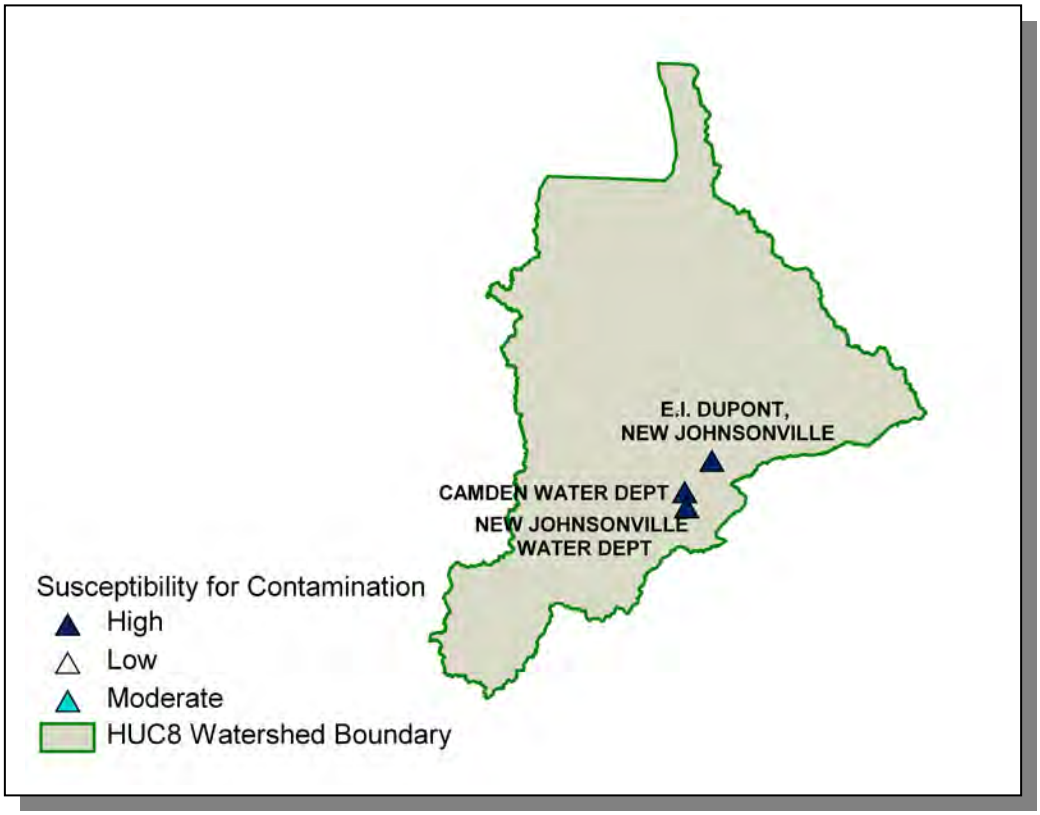


Figure 5-1. Susceptibility for Contamination in the Tennessee River Western Valley (Kentucky Lake) Watershed.

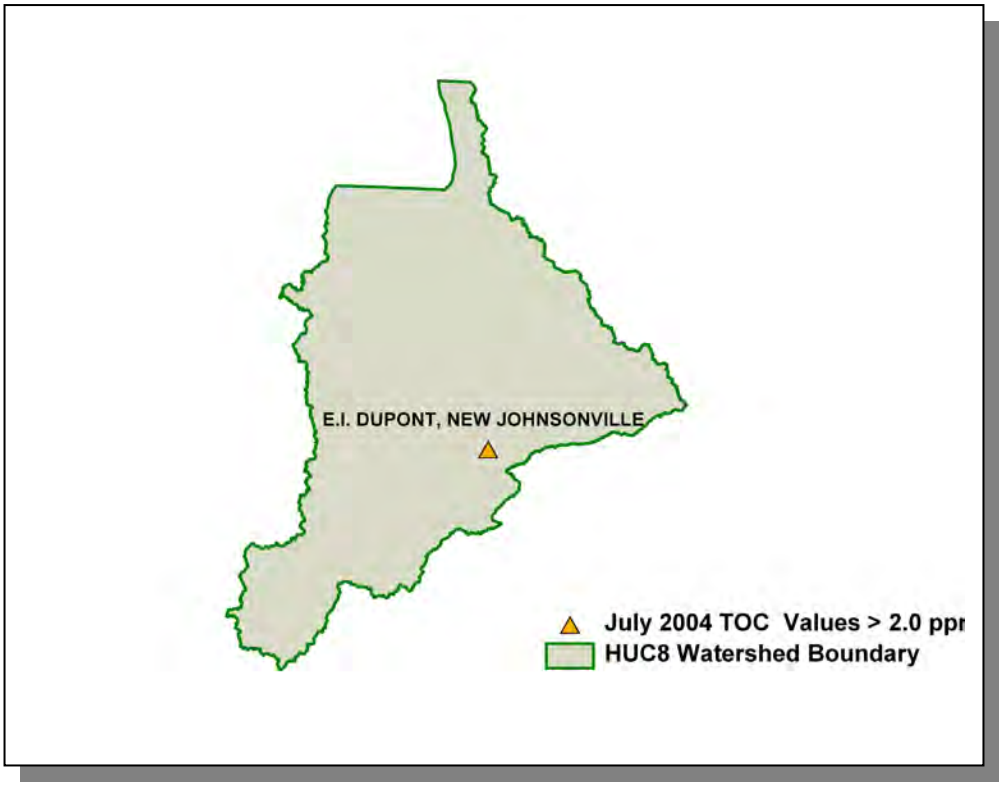


Figure 5-2. July 2005 Raw Water Total Organic Carbon (TOC) Analysis in the Tennessee River Western Valley (Kentucky Lake) Watershed.

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

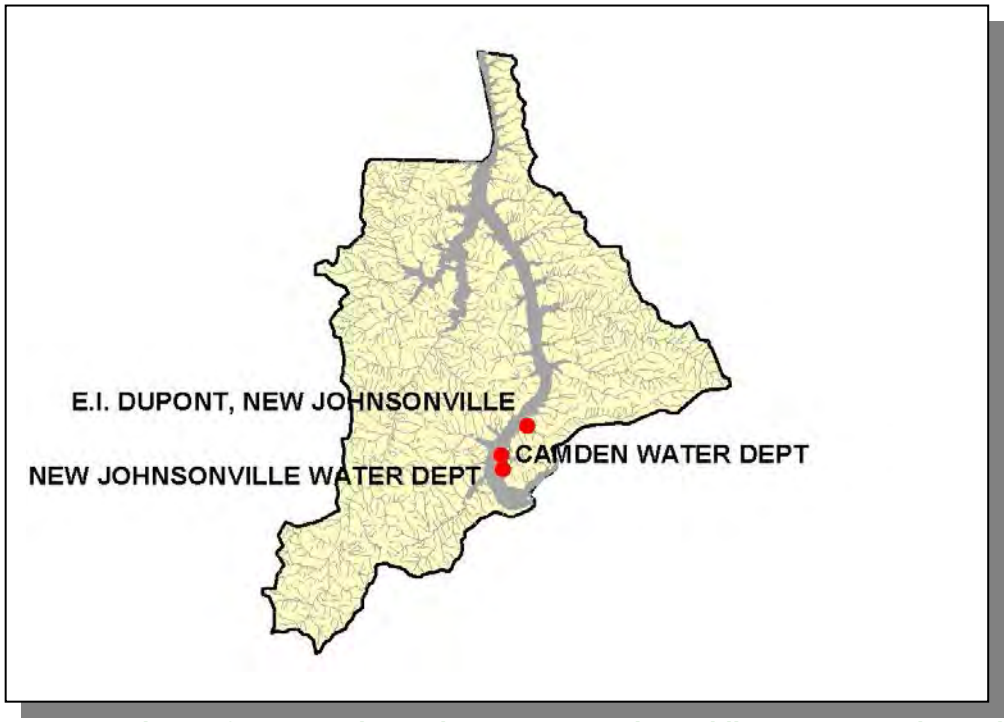


Figure 5-3. Locations of Community and Non-Community Public Water Supply Intakes in the Buffalo River Watershed.

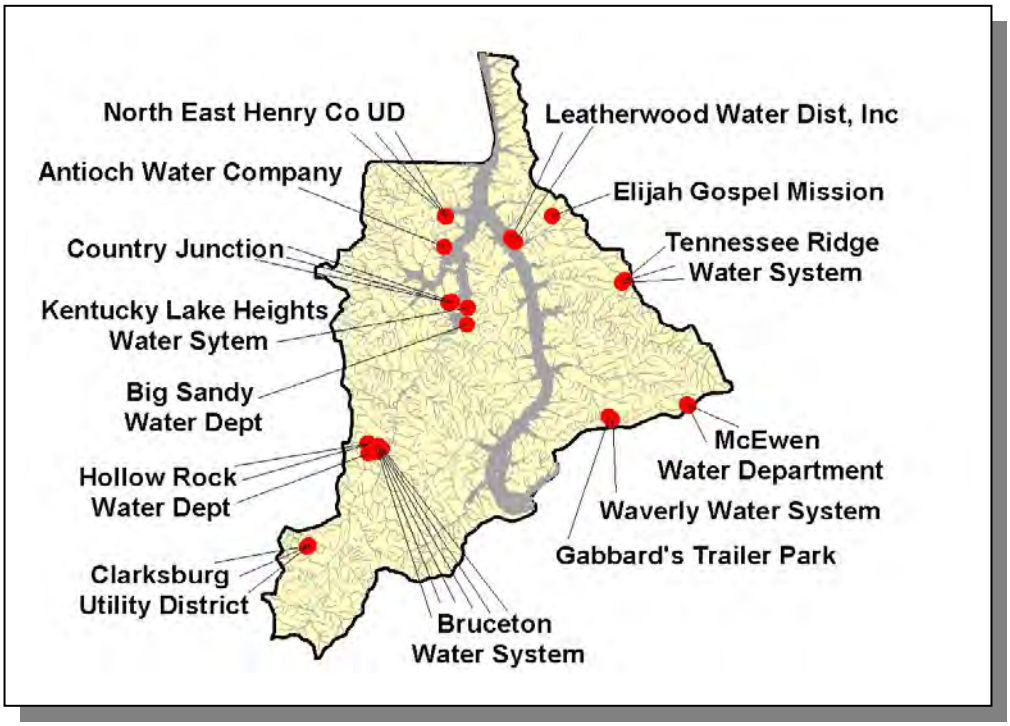


Figure 5-4. Locations of Community and Public Groundwater Supply Intakes in the Tennessee Portion of the Tennessee Western Valley (Kentucky Lake) Watershed.

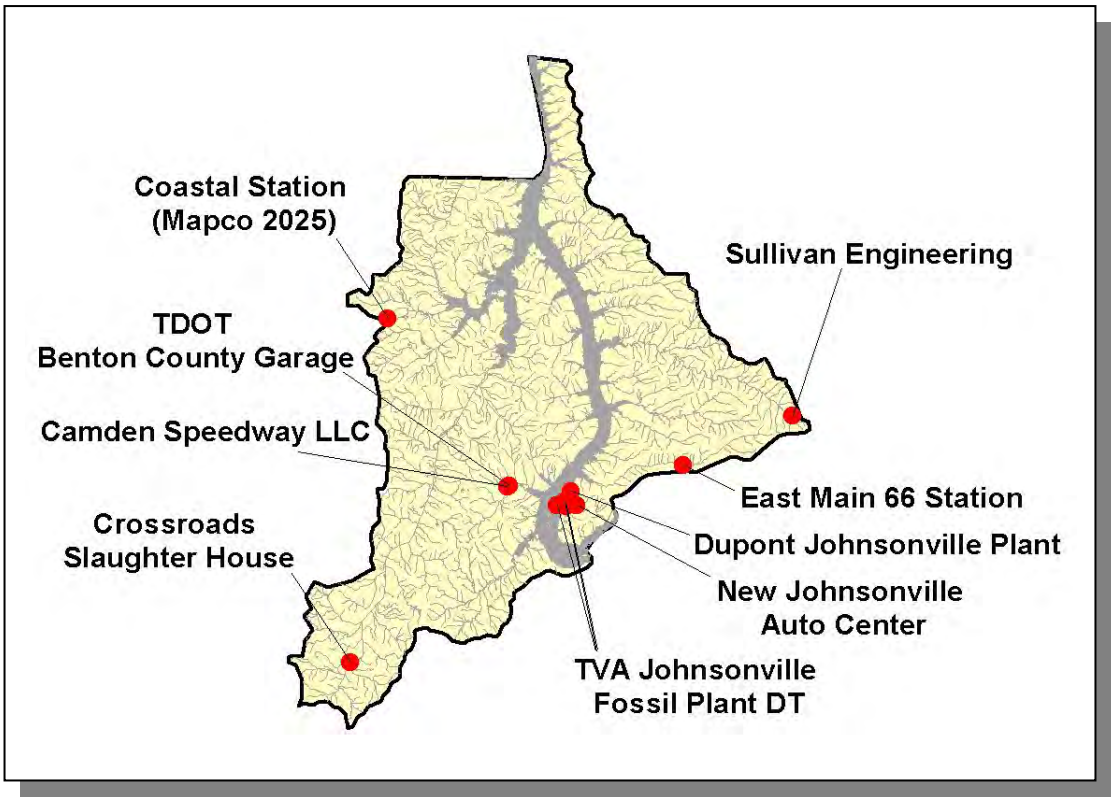


Figure 5-5. Locations of UIC (Underground Injection Control) Sites in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Injection wells include stormwater sinkholes modified for drainage, commercial/industrial septic tanks, and large capacity septic tanks.*

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.

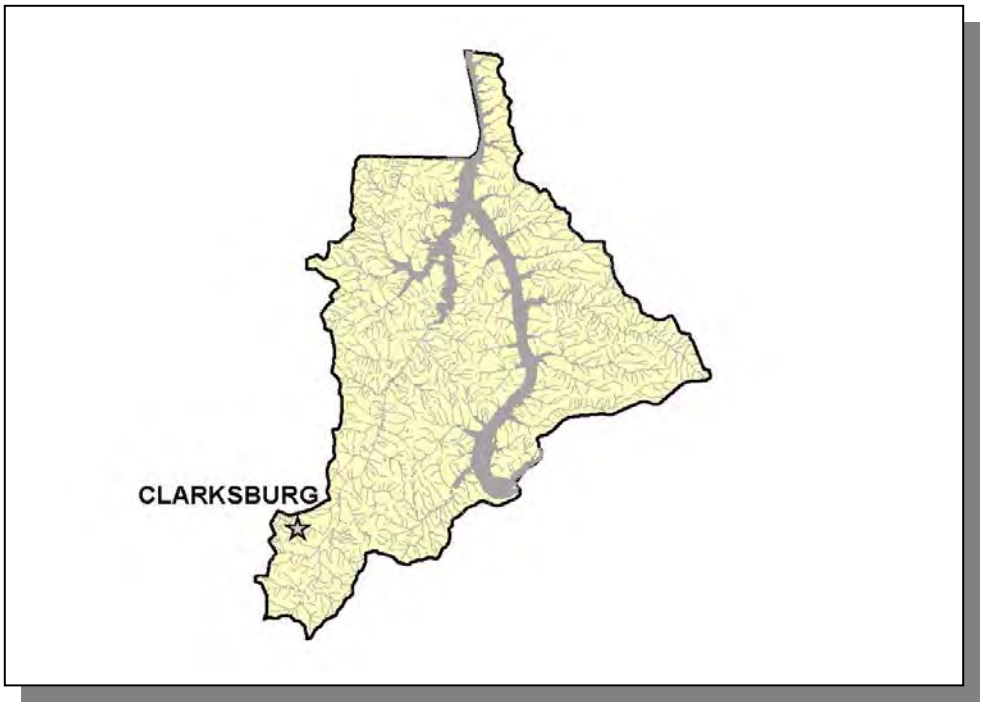


Figure 5-6. Location of Communities Receiving SRF Loans or Grants in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *More information is provided in Appendix V.*

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 Tennessee Western Valley (KY Lake) Watershed was funded under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program (U.S. Environmental Protection Agency Assistance Agreements C9994674-00-0, C9994674-01-0, and C9994674-02-0).

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

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

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

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

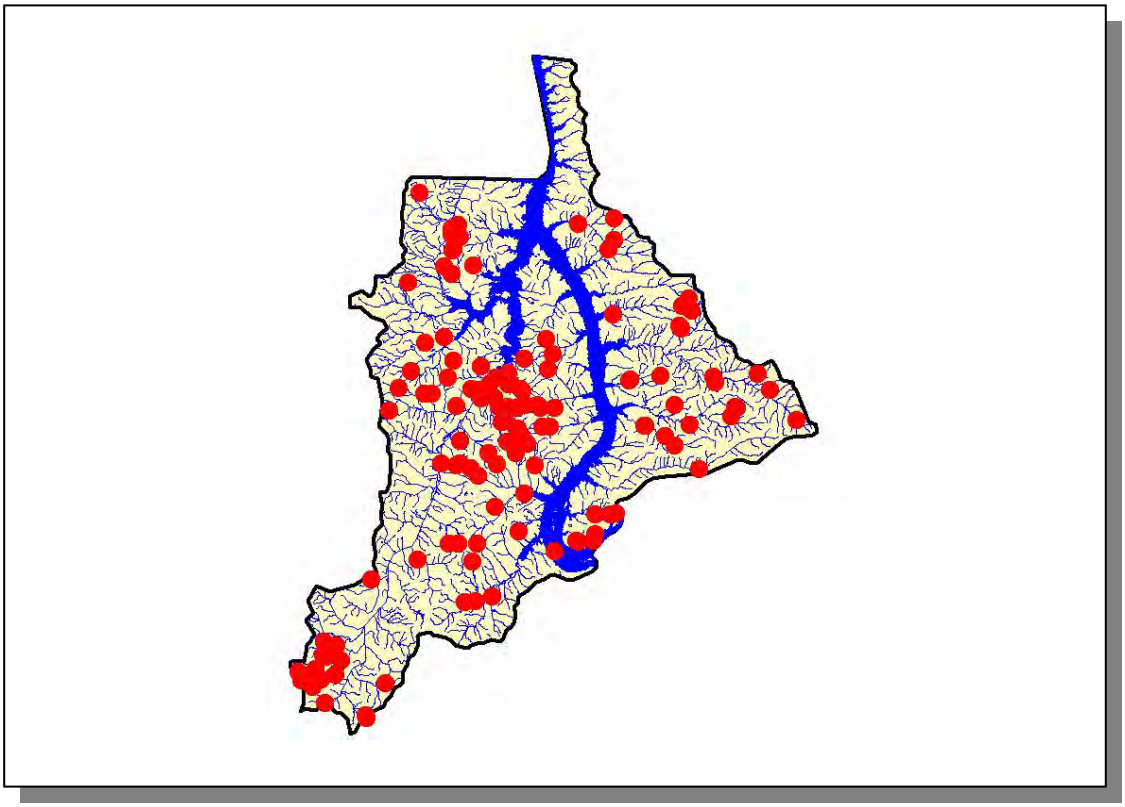


Figure 5-7. Location of BMPs installed from 1999 through 2003 in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed with Financial Assistance from the Tennessee Department of Agriculture's Nonpoint Source and Agricultural Resources Conservation Fund Grant Programs. *More information is provided in Appendix V.*

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

Benefits to the people of Kentucky include:

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

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

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

Watershed Framework activities in the Tennessee Western Valley (KY Lake) Watershed are coordinated through the Four Rivers Basin Team. The Four River Basin Team is a multi-agency task force that meets regularly to help in development of monitoring strategies, education and outreach, prioritization of issues and watersheds within the basin, planning, and networking among technical staff and local leaders to apply agency resources to implement fixes. For more info about the Four Rivers Basin Team contact:

Bob Wise
Four Rivers Basin Coordinator
(270)-554-1022
robert.wise@jpf.org.

The web address is http://www.watersheds.ky.gov/basins/four_rivers/

No HUC 11 watersheds draining to KY Lake were identified as a priority watershed for planning in the first cycle. However there are some projects under way in the HUC 8 watershed. A $330,000 319(h) funded project at the Pirates Cove lakeside community

has been underway for some time. The need for the project was identified based on data that showed bacteria contamination in the Jonathan Creek embayment on KY Lake. The project will implement a community wastewater treatment system to address the problem. This will hopefully be completed over the next year or so.

The Four Rivers Watershed Watch, in conjunction with Murray State University, has conducted monitoring on some of the KY Lake embayments. Data are available at http://kywater.org/watch/fourrivers/

There are also a number of programs such as the Clean Marina Program and the Clean Boating Program that the Four Rivers Basin Team cosponsors with other partners.

Tennessee River, above Yellow Spring Branch (06040005270)

Geography. This hydrologic unit represents the Tennessee River from the Tennessee state line downstream to the mouth of the Blood River. The eastern side of this watershed is part of the Land Between the Lakes National Recreation Area in Tennessee and is not discussed in this report. The terrain of the watershed is typical of the transitional region between the Pennyroyal and Jackson Purchase known as "the breaks". The landscape is rugged with narrow valleys rising quickly to narrow ridges. Elevations vary 75-150 feet between valleys and ridge tops.

Waterways. This hydrologic unit drains about 30 square miles and contains about 70 total stream/lake miles. Tributaries in Kentucky include Cypress Creek and Yellow Spring Branch. Kentucky Lake inundates this entire segment of the Tennessee River. There are no KPDES permits recorded for this hydrologic unit.

Land cover/land use. Most of this watershed is covered with deciduous forest. Much of the shoreline is part of the Kentucky Lake Wildlife Management Area. A few areas along ridges on the western watershed perimeter are used for agriculture. There are numerous residential areas around Kentucky Lake, especially at Hamlin and Fort Heiman.

Agency Data Assessment. Not currently assessed.

Watershed Rankings. The data-driven ranking process for the 4 Rivers region indicated the watershed as an overall low priority.

Blood River (06040005290)

Geography. The Blood River arises in Henry County, Tennessee and flows generally northward into Calloway County where it joins the Tennessee River at Kentucky Lake. The terrain of the watershed is typical of the transitional region between the Pennyroyal and Jackson Purchase known as "the breaks". The landscape is rugged with relatively wide valleys that rise sharply to narrow ridges. Elevations vary 75-175 feet between valleys and ridge tops.

Waterways This watershed drains about 90 square miles and contains about 250 total stream miles. Tributaries include McCullough Fork, Lax Creek, Dog Creek, Panther Creek, Wildcat Creek, Sugar Creek, Little Sugar Creek, Grindstone Creek, Tan Branch and Beechy Creek. Kentucky Lake inundates the lower portion of the Blood River. There are no KPDES permits recorded for this watershed.

Land cover/land use. Much of the land around Kentucky Lake is covered with deciduous forest. There are large wetland areas around the lower section of the Blood River as well as the lower reaches of many of the tributaries. A large portion of the lower reach of the Blood River and Beechy Creek are part of the Kentucky Lake and Beechy Creek Wildlife Management Areas. Agriculture production occurs along the ridge tops on the western side of the watershed and in some of the wider valleys. An active state Superfund site is located in the watershed. Residential developments are located around the Blood River embayment. A small gravel mine is located in the watershed.

Agency Data Assessment. During the 2000 water quality assessment the main stem of the Blood River was assessed from the backwaters of Kentucky Lake upstream to the Tennessee state line. This 7.4-mile segment was assessed for fish, macroinvertebrates and algae. The segment was judged fully supporting for aquatic life.

- The tributaries of Beechy Creek, Panther Creek, Sugar Creek and Wildcat Creek were also assessed and judged fully supporting for aquatic life.

Watershed Rankings. The data-driven ranking process for the 4 Rivers region indicated the watershed as an overall low priority.

<u>Tennessee River, at Jonathan Creek (06040005310)</u>

Geography. This hydrologic unit represents the Tennessee River from the mouth of the Blood River downstream to a small tributary just below Kentucky Dam. Most of the eastern side of this watershed is part of the Land Between the Lakes National Recreation Area. The Tennessee Valley Divide runs north to south down the middle of the Land Between the Lakes and forms the watershed boundary between the Cumberland River at Lake Barkley and the Tennessee River at Kentucky Lake. The terrain of the watershed is typical of the transitional region between the Pennyroyal and Jackson Purchase known as “the breaks”. The landscape is rugged with narrow valleys that rise sharply to narrow ridges. Elevations vary 75-150 feet between valleys and ridge tops.

Waterways. This hydrologic unit drains over 240 square miles and contains about 575 total stream/lake miles. Tributaries include Snipe Creek, Anderson Creek, Cool Creek, Jonathan Creek, Bear Creek, Little Bear Creek, Pisgah Creek, Smith Creek, Duncan Creek, Higgins Branch, Rhodes Creek, Blockhouse Creek, Golson Creek and Rhodes Creek. Kentucky Lake inundates this segment of the Tennessee River upstream of Kentucky Dam. There are 24 active KPDES permits recorded for this hydrologic unit.

Land cover/land use. The Land Between the Lakes area on the eastern side of the watershed is almost completely covered with deciduous forest. On the western side forest areas remain around the perimeter of the lake. Some shoreline areas are part of

the Kentucky Lake Wildlife Management Area. Agricultural production of swine, poultry and row crops occurs along ridge tops around Jonathan Creek. Residential developments are common along the western shore of the lake. Commercial and industrial developments are located near the city of Grand Rivers. Numerous active state Superfund sites are located near Grand Rivers.

Agency Data Assessment. During the 2000 water quality assessment a 1.3-mile segment of the Tennessee River below Kentucky Dam was assessed for fish and was judged partially supporting.

- An 11.8-mile segment of Jonathan Creek was assessed for fish and macroinvertebrates. This segment was judged partially supporting for aquatic life.

- A 3.3-mile segment of Little Jonathan Creek was assessed for fish and macroinvertebrates. This segment was judged fully supporting for aquatic life.

- A 3.2-mile segment of Bear Creek above the Kentucky Lake backwaters was assessed for fecal coliform bacteria and was judged not supporting for primary contact recreation.

- The tributaries of Ledbetter Creek and Turkey Creek were assessed and judged fully supporting for aquatic life.

- A 1.7-mile segment of Clear Creek was assessed for macroinvertebrates, but the data was judged to be inconclusive for support of aquatic life.

Watershed Rankings. The data-driven ranking process for the 4 Rivers region indicated the watershed as an overall high priority due to a high need for restoration and a high concern from potential impacts. The main factor for restoration is observed impacts that indicate 16.3 miles of streams not fully supporting their designated uses. Potential impacts include a high population increase, a high number of permitted discharges, a high number of discharge violations, a high potential for erosion from agricultural activity and a high potential contaminants score.

For more info about the KY Watershed Initiative, or for more info about each basin, go to http://www.watersheds.ky.gov/Default.htm. At this site you can also link to a watershed viewer that offers narratives containing basic info such as land use, geography, permits, etc. for each HUC 11.

5.4. LOCAL INITIATIVES.

5.4.A. Five Rivers RC&D Council. The Mission of the Five Rivers RC&D Council is to promote activities that will enhance the quality of life, conserve natural resources, and promote economic development in the council area.

The Five Rivers RC & D Council covers seven counties in Middle Tennessee. Named for the 5 major rivers flowing through the area, the council serves Cheatham, Dickson, Houston, Humphreys, Montgomery, Robertson, and Stewart Counties. With the natural resources and community activities being diverse in geography, the Council responds to the needs of their local communities, both for conservation issues and for economic and rural development. The collaboration of its numerous partners makes the Five Rivers RC & D Council Area distinctive.

The Five Rivers RC & D Council assists in administering the Resource Conservation and Development Program, which is a unique combination of private enterprise and federal assistance that encourages economic growth through development, conservation and planned utilization of natural resources across the Council Area and Tennessee. Just a few services the RC&D program is providing in our community are Conservation Education, Farmland Protection, providing Technical Assistance, ensuring Community Services, establishing Sustainable Development, encouraging Natural Resources Protection, and Communicating Local Issues.

The Five Rivers RC&D Council participated in The National Clean Boating Campaign on the mighty Tennessee River at the Pebble Isle Marina near New Johnsonville in mid June. Sponsoring along with the Tennessee Valley Authority (TVA) Watershed Team and the WRJB Radio Station, the partnership program stressed the importance of clean water so boating and other recreational activities will continue to be fun and safe for future generations. The materials distributed throughout the day demonstrate how boaters can be good stewards of their water environment through best boating and marina practices. Other promotional items given to visiting boaters were tee shirts, hats, and whistles for the kids. The local residents were on notice from the advertisements for the event running for two weeks.

The sponsoring agencies were able to describe their role and niche in protecting the water resources in Middle Tennessee. The Five Rivers RC&D Council described some of their other projects and the mission of the Council. TVA listed several programs they are involved with across the Kentucky Lake watershed.

The Pebble Isle Marina was especially designated as a Clean Marina due to the pump out facility available for boats. The Marina owners are eager to expand their facility as well as protect the embankment where they are located. Establishing cost effective measures for businesses as well as private landowners is the focus of the collaboration of the Five Rivers RC & D Council and Tennessee Valley Authority.

For more information on the Five Rivers RC & D Council and its programs, contact Chandra Berry, RC & D Coordinator at (931) 368-0252 ext. 5 or visit the web site at: http://www.fiveriversrcd.org

CHAPTER 6

RESTORATION PRIORITIES IN THE TENNESSEE WESTERN VALLEY (KY LAKE) WATERSHED

6.1. BACKGROUND.

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

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

This Chapter addresses point and nonpoint source approaches to water quality problems in the Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed.

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

6.2.A. Year 1 Public Meeting. The first Tennessee Western Valley (KY Lake) Watershed public meeting was held as two meetings: October 26, 1998 at Camden Town Hall and October 27, 1998 at Savannah 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/Comments

- TVA and TDEC/WPC need to coordinate monitoring efforts in order to be efficient and make the most uses of resources

6.2.B. Year 3 Public Meeting. The second Tennessee Western Valley (KY Lake) Watershed public meeting was held April 9, 2001 at the Paris Courthouse. The goals of the meeting were to: (1) provide an overview of the watershed approach, (2) review the monitoring strategy, (3) summarize the most recent water quality assessment, (4) discuss the TMDL schedule and citizens' role in commenting on draft TMDLs, and (5) discuss BMPs and other nonpoint source tools available through the Tennessee Department of Agriculture 319 Program and NRCS conservation assistance programs.

Major Concerns/Comments

- Gravel, sand, and sediment is filling streams
- Lack of drainage of water on private property (along Holly Creek)
- Lack of zoning to uncontrolled development, leading to runoff

6.2.C. Year 5 Public Meeting. The third scheduled Tennessee Western Valley (KY Lake) Watershed public meeting was held October 18, 2005 at the Nathan Bedford Forrest State Park Museum. The meeting was held jointly with the East Fork Clark's River Watershed and 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
- TVA display

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

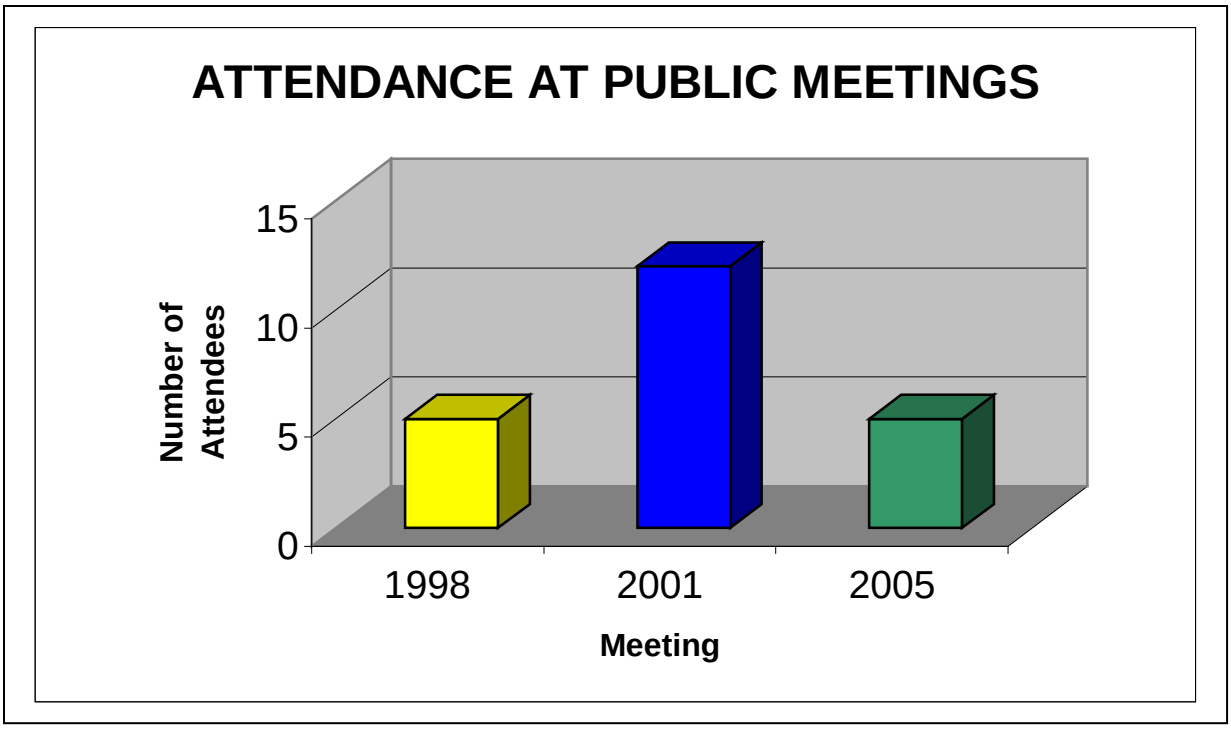


Figure 6-1. Attendance at Public Meetings in the Tennessee Western Valley (KY Lake) Watershed. *1998 attendance numbers represent Tennessee Western Valley (Beech River and KY Lake) Watersheds and East Fork Clark's River Watersheds joint meeting; 2005 meeting attendance number represents Tennessee Western Valley (KY Lake) and East Fork Clark's River Watersheds joint meeting. Attendance numbers do not include TDEC personnel.*

Figure 6-2. The Watershed Meeting Comes to Order as Pat Patrick, Manager of the Jackson Environmental Field Office, Welcomes Participants.

Figure 6-3. The SmartBoard™ is an Effective Interactive Tool to Teach Citizens About the Power of GIS.

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/.

Approved TMDL:

Holly Fork Creek, Little Beaver Creek, Mud Creek, and Big Sandy River. TMDL for pathogens in the Tennessee Western Valley (KY Lake) Watershed. Approved March 1, 2005.
http://www.state.tn.us/environment/wpc/tmdl/approvedtmdl/KYLakeF2.pdf

TMDLs are prioritized for development based on many factors.

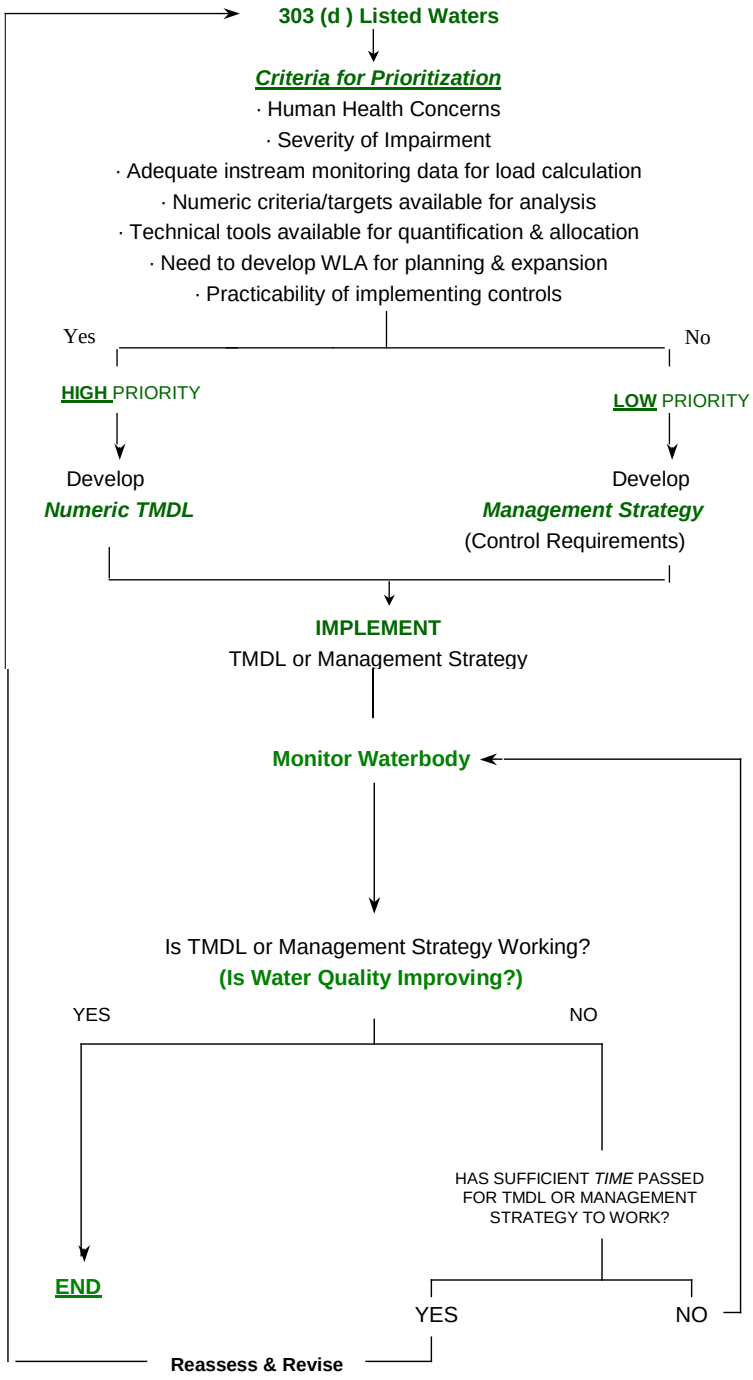


Figure 6.4. Prioritization Scheme for TMDL Development.

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, existing point source regulations can have only a limited effect. Other measures are, therefore, necessary.

There are several state and federal regulations that address some of the contaminants impacting waters in the Tennessee Western Valley (KY Lake) 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 efforts by landowners and volunteer groups and the possible implementation of new regulations. Many agencies, such as the Tennessee Department of Agriculture (TDA) and the Natural Resources Conservation Service (NRCS), offer financial assistance to landowners for corrective actions (like Best Management Practices) that may be sufficient for recovery of impacted streams. Many nonpoint problems will require an active civic involvement at the local level geared towards establishment of improved zoning guidelines, building codes, streamside buffer zones and greenways, and general landowner education.

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

6.3.B.i. Sedimentation.

6.3.B.i.a. From Construction Sites. Construction activities have historically been considered “nonpoint sources.” In the late 1980’s, EPA designated them as being subject to NPDES regulation if more than 5 acres were being disturbed. In the spring of 2003, that threshold became 1 acre. The general permit issued for such construction sites establishes conditions for maintenance of the sites to minimize pollution from storm water runoff, including requirements for installation and inspection of erosion 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 Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed are West Sandy Creek and Trace 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.

6.3.B.i.b. From Channel and/or Bank Erosion. Many streams within the Tennessee Western Valley (KY Lake) Watershed suffer from varying degrees of streambank erosion. When steam channels are altered, or large tracts of land are cleared, storm water runoff, will cause banks to become unstable and highly erodable. Heavy livestock traffic can also severely disturb banks. Destabilized banks contribute to sediment load and to the loss of beneficial riparian vegetation to the stream. West Sandy Creek, Holly Fork Creek, and Big Sandy River are examples of streams impacted by bank erosion.

Some inappropriate agricultural practices have impacted the hydrology and morphology of stream channels in this watershed.

Several agencies such as NRCS, TVA, and TDA, as well as watershed citizen groups, are working to stabilize portions of stream banks using bioengineering and other techniques. Many of the affected streams, like Big Sandy River, could benefit from these types of projects. Other methods or controls that might be necessary to address common problems are:

Voluntary activities

- Re-establish bank vegetation (example: Mud Creek, Trace Creek).
- Establish off-channel watering areas for livestock by moving watering troughs and feeders back from stream banks (examples: Little Beaver Creek and Big Sandy River).
- Limit cattle access to streams and bank vegetation (example: Little Beaver Creek).

Additional strategies

- Increase efforts in the Master Logger program to recognize impaired streams and require more effective management practices.
- Better community planning for the impacts of development on small streams, especially development in growing areas (example: Trace Creek).
- Limit livestock access to streams and bank vegetation (example: Little Beaver Creek).
- Require post-construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion.
- Implement additional restrictions on logging in streamside management zones.
- Limit clearing of stream and ditch banks (example: Mud Creek). *Note: Permits may be required for any work along streams.*
- Limit road and utilities crossings of streams.
- Restrict the use of off-highway vehicles on stream banks and in stream channels.

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

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

Since the Dust Bowl era, 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. Mud Creek has already had several BMPs installed to address the sediment lost from fields in this watershed. Henry County farmers are leaders in the No-Till efforts with about 90% of row crops in No-Till.

Many sediment problems traceable to agricultural practices also involve riparian loss due to close row cropping or pasture clearing for grazing. Agriculturally impacted streams that could benefit from the establishment of riparian buffer zones include Mud Creek, Dry Creek, and Big Beaver Creek.

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 from pets, livestock and wildlife washed into streams and storm drains. Permits issued by the Division of Water Pollution Control regulate discharges from point sources and require adequate control for these sources. Individual homes are required to have subsurface, on-site treatment (i.e., septic tank and field lines) if public sewers are not available. The Division of Ground Water Protection within the Jackson and Nashville Field Offices and delegated county health departments regulate septic tanks and field lines. 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 water disposal.

Currently, only five streams systems in the Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed are known to have excessive pathogen contamination. They are Holly Fork Creek, Little Beaver Creek, Mud Creek, and two segments of Big Sandy River. All five have a significant amount of pasture grazing in the watershed. Little Beaver Creek and the upper portion of Big Sandy River drain the Parkers Crossroads area where commercial development and failing septic tanks have contributed to the contamination. Recent efforts by Parkers Crossroads, Henderson County, and the City of Lexington have eliminated this source by the installation of a sewage collection system and treatment in the existing Lexington STP.

Other measures that may be necessary to control pathogens are:

Voluntary activities

- Off-channel watering of livestock (example: Little Beaver Creek).
- Limit livestock access to streams.
- Improve and educate on the proper management of animal waste from feeding operations (example: Holly Fork Creek).

Enforcement strategies

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

Additional strategies

- Develop intensive planning in areas where sewer is not available and treatment by subsurface disposal is not an option due to poor soils, floodplains, or high water tables.
- Discourage the creation of “duck holes” that attract waterfowl.
- Develop and enforce leash laws and controls on pet fecal material.
- 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, from fertilized lawns and croplands, and faulty sewage disposal processes. Nutrients are often transported with sediment, so many of the measures designed to reduce sediment runoff will also aid in preventing organic enrichment of streams and lakes.

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. 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. An intact riparian zone also acts as a buffer to filter out nutrient loads before they enter the water. Mud Creek would benefit from additional canopy and a riparian zone.
- Discourage impoundments. Ponds and lakes do not aerate water. Maple Creek is impacted by poor quality releases from Maple Creek Lake. *Note: Permits may be required for any work on a stream, including impoundments.*

Regulatory strategies.

- Strengthen enforcement of regulations governing on-site wastewater treatment.
- Impose more stringent permit limits for nutrients discharged from sewage treatment plants.
- Timely and appropriate enforcement for noncomplying sewage treatment plants, large and small, and their collection system.
- Identify Concentrated Animal Feeding Operations not currently permitted.

6.3.B.iv. Toxins and Other Materials.

Although some toxic substances are discharged directly into waters of the state from a point source, much of these materials are washed in during rainfalls from an upland location, or via improper waste disposal that contaminates groundwater. In the Tennessee portion of the Tennessee Western Valley (KY Lake) Watershed, no streams are currently identified as impaired by storm water runoff from industrial facilities, and only Trace Creek from urban runoff. More stringent inspection and regulation of permitted industrial facilities, and local strormawter quality initiatives and regulations, could help reduce the amount of contaminated runoff reaching state waters.

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 blatant examples of pollution in streams.

Some of these problems can be addressed by:

Voluntary activities

- Provide public education.
- Paint warnings on storm drains that connect to a stream. These warnings are most useful in urban areas and would benefit Town Creek and Bailey Fork Creek in Paris, and Cane Creek in Camden.
- Sponsor community clean-up days.
- Landscape public areas.
- Encourage public surveillance of their streams and reporting of dumping activities to their local authorities.

Enforcement strategies

- Prohibit illicit discharges to storm drains.
- Strengthen litter law 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.

Individual landowners and developers are responsible for the vast majority of stream alterations. Some measures that can help address these problems are:

Voluntary activities

- Sponsor litter pickup days to remove litter that might enter streams
- Organize stream cleanups removing trash, limbs and debris before they cause blockage.
- Avoid use of heavy equipment to "clean out" streams.
- Plant native vegetation along streams to stabilize banks and provide habitat (example: Trace Creek).
- Encourage developers to avoid extensive use of 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.

6.3.B.v. Acid Mine Runoff.

The Paris area has a long history of clay mining. Runoff from mined areas can have a low pH and contain metals that impact the stream. A remediation project at the old Golden Cat clay mine is currently controlling the acid runoff, but other mined areas may need treatment to avoid impacts to Clifty Creek

Streams that would benefit from remediation projects include the Upper Collins River, Ranger Creek and Dry Creek.

APPENDIX II

ID	NAME	HAZARD		ID	NAME	HAZARD
037001	Dyer	3		407013	Taylor	3
037002	Butterworth	3		407016	Smith	2
037003	Blackburn	3		407039	B and W Lake	L
037005	Crossnoe	L		037011	Tenn Silica	3
037006	Cole	L		097017	Higdon	3
037007	Cedar Lake #1	3		407011	Green Acres	1
037008	Cedar Lake #2	3		427002	Lakeview Circle	2
037009	Jackson	L		037004	Settling Pond	2
037010	Sullins	S		187021	Hiawatha	2
097001	Maple Creek	2		437016	Hooper	H
407001	Weaks Lake	L				

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

LAND COVER/LAND USE	ACRES	% OF WATERSHED
Open Water	68,025	7.32
Other Grasses	1,186	0.13
Pasture/Hay	116,417	12.52
Row Crops	87,823	9.45
Small Grains	108	0.01
Woody Wetlands	36,482	3.92
Emergent Herbaceous Wetlands	2,871	0.31
Deciduous Forest	505,655	54.40
Mixed Forest	47,073	5.06
Evergreen Forest	39,535	4.25
High Intensity: Commercial/Industrial	4,224	0.45
High Intensity: Residential	892	0.10
Low Intensity: Residential	6,391	0.69
Quarries/Strip Mines/Gravel Pits	828	0.09
Bare Rock/Sand/Clay	858	0.09
Transitional	11,168	1.20
Total	**929,536**	**100.00%**

Table A2-2. Land Use Distribution in the Tennessee Portion of the Tennessee Western Valley-KY Lake 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)	
Blackland Prairie (65a)	Unnamed Tributary To Muddy Creek	Little Hatchie River	08010207
Southeastern Plains and Hills (65e)	Blunt Creek (65E04)	TWV-KY Lake	06040005
	Griffin Creek (65E06)	NF Forked Deer River	08010204
	Harris Creek (65E08)	SF Forked Deer River	08010205
	Marshall Creek (65E10)	Hatchie River	08010208
	West Fork Spring Creek (65E11)	Hatchie River	08010208
Fall Line Hills (65i)	Battles Branch (65I02)	TWV-Beech River	06040001
Western Highland Rim (71f)	South Harpeth Creek (71F12)	Harpeth River	05130204
	Wolf Creek (71F16)	Lower Duck River	06040003
	Brush Creek (71F19)	Buffalo River	06040004
	Swanegan Branch (71F27)	Pickwick Lake	06030005
	Little Swan Creek (71F28)	Lower Duck River	06040003
	Hurricane Creek (71F29)	Lower Duck River	06040003
Loess Plains (74b)	Powell Creek (74B04)	Obion River	08010202
	Wolf River (74B12)	Wolf River	08010210

Table A2-3. Ecoregion Monitoring Sites in Ecoregions 65a, 65e, 65i, 71f, and 74b.

CODE	NAME	AGENCY	AGENCY ID
30	TDEC/DNH Clendenin Creek TVA Habitat Protection Area Site	TDEC/DNH	M.USTNHP 257
140	TDEC/DNH Land Between the Lakes Site	TDEC/DNH	M.USTNHP 223
218	USACOE-Nashville Client Site	USACOE-Nashville	
224	USACOE-Nashville Client Site	USACOE-Nashville	
239	USACOE-Nashville Client Site	USACOE-Nashville	
268	USACOE-Nashville Client Site	USACOE-Nashville	
269	USACOE-Nashville Client Site	USACOE-Nashville	
290	TDOT Birdsong Creek Mitigation Site	TDOT	
291	TDOT Old SR 69 Mitigation Site	TDOT	
298	TDOT SR 76 Mitigation Site	TDOT	
314	TDOT SR 22 Mitigation Site	TDOT	
323	TDOT SR 218 Mitigation Site	TDOT	
336	TDOT SR 22 Mitigation Site	TDOT	
381	TDOT SR 218 Permit Site	TDOT	
388	TDOT SR 76 Permit Site	TDOT	
390	TDOT SR 22 Permit Site	TDOT	
440	TDEC/WPC Cane Creek Headwaters WPC Mitigation Site	TDEC/WPC	
441	TDEC/WPC Cane Creek Headwaters WPC Permit Site	TDEC/WPC	
880	USFWS Richard Holland WRP Site	USFWS	
1336	USACOE Middle Fork Obion River 94-001 [TF] Site	USACOE-Memphis	
1401	USACOE South Fork Obion River/Beaver Creek-3 (TD) Site	USACOE-Memphis	
1524	USACOE-ORN NWP 9 File No.960047217 Site	USFWS	
1526	USACOE-ORN NWP/Waste Management Inc. Site	USFWS	
1829	NRCS Site	NRCS	
1950	TWRA West Sandy-Bailey Fork Site	TWRA	
2131	YWRA Bailey Fork Creek Site	TWRA	
2132	YWRA Bailey Fork Creek Site	TWRA	
2133	YWRA Bailey Fork Creek Site	TWRA	
2134	YWRA Bailey Fork Creek Site	TWRA	
2135	YWRA Bailey Fork Creek Site	TWRA	
2136	YWRA Bailey Fork Creek Site	TWRA	
2137	YWRA Bailey Fork Creek Site	TWRA	
2138	YWRA Bailey Fork Creek Site	TWRA	
2139	YWRA Bailey Fork Creek Site	TWRA	
2140	YWRA Bailey Fork Creek Site	TWRA	
2141	YWRA Bailey Fork Creek Site	TWRA	
2142	YWRA Bailey Fork Creek Site	TWRA	
2143	YWRA Bailey Fork Creek Site	TWRA	
2263	TWRA Big Sandy Site	TWRA	
2264	TWRA Big Sandy Site	TWRA	
2265	TWRA Big Sandy Site	TWRA	
2334	TWRA Big Sandy Site	TWRA	
2335	TWRA Big Sandy Site	TWRA	
2336	TWRA Big Sandy Site	TWRA	
2337	TWRA Big Sandy Site	TWRA	
2338	TWRA Big Sandy Site	TWRA	
2339	TWRA Big Sandy Site	TWRA	
2340	TWRA Big Sandy Site	TWRA	
2341	TWRA Gin Creek Site	TWRA	
2342	TWRA Gin Creek Site	TWRA	

CODE	NAME	AGENCY	AGENCY ID
2343	TWRA Gin Creek Site	TWRA	
2344	TWRA Gin Creek Site	TWRA	
2345	TWRA Gin Creek Site	TWRA	
2346	TWRA Gin Creek Site	TWRA	
2517	TWRA Bailey Fork Creek Site	TWRA	
2518	TWRA Bailey Fork Creek Site	TWRA	
2519	TWRA Bailey Fork Creek Site	TWRA	
2520	TWRA Bailey Fork Creek Site	TWRA	
2521	TWRA Bailey Fork Creek Site	TWRA	
2522	TWRA Bailey Fork Creek Site	TWRA	
2523	TWRA Bailey Fork Creek Site	TWRA	
2424	TWRA Site	TWRA	
2525	TWRA Bailey Fork Creek Site	TWRA	
2526	TWRA Bailey Fork Creek Site	TWRA	
2527	TWRA Bailey Fork Creek Site	TWRA	
2528	TWRA Bailey Fork Creek Site	TWRA	
2529	TWRA Bailey Fork Creek Site	TWRA	
2530	TWRA Bailey Fork Creek Site	TWRA	
2531	TWRA Bailey Fork Creek Site	TWRA	
2693	NRCS Site	NRCS	
2713	TWRA Holly Fork Site	TWRA	
2721	USACOE Vaughn Branch 0.6 Site	USACOE-Nashville	960049370

Table A2-4. Wetland Sites in the Tennessee Portion of the Tennessee Western Valley-KY Lake Watershed in TDEC Database. *TDEC, Tennessee Department of Environment and Conservation; USACOE-Nashville, United States Army Corps of Engineers-Nashville District; WPC, Water Pollution Control; TDOT, Tennessee Department of Transportation; NRCS, Natural resources Conservation Service; USFWS, United States Fish and Wildlife Service; TWRA, Tennessee Wildlife Resources Agency; DNH, Division of Natural Heritage.* ***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)
Ammon Creek	TN06040005047_1100	4.3
Bailey Fork Creek	TN06040005024_0100	21.3
Bear Creek	TN06040005027_1600	46.7
Beaverdam Creek	TN06040005024_0700	12.0
Big Richland Creek	TN06040005056_1000	18.5
Birdsong Creek	TN06040005047_1000	18.6
Blood River	TN06040005019_1000	5.6
Blunt Creek	TN06040005027_0900	26.2
Britton Creek	TN06040005027_0500	4.8
Cane Creek	TN06040005061_1000	20.7
Cherry Creek	TN06040005027_1300	15.0
Crooked Creek	TN06040005948_1000	6.9
Cypress Creek	TN06040005870_1000	11.9
Dabbs Creek	TN06040005032_0400	10.2
Deer Creek	TN06040005056_0300	12.1
Eagle Creek	TN06040005098_1000	4.2
East Fork Leatherwood Creek	TN06040005548_0200	12.1
Greenbriar Creek	TN06040005027_0211	5.0
Hurricane Creek	TN06040005063_1000	15.7
Leatherwood Creek	TN06040005548_1000	7.7
Lick Creek	TN06040005027_0400	11.0
Lick Creek	TN06040005956_1000	10.9
Little Birdsong Creek	TN06040005047_1200	11.0
Little Richland Creek	TN06040005054_1000	25.9
Long Branch	TN06040005059_0400	20.4
Maple Creek	TN06040005032_0100	11.4
Martin Creek	TN06040005027_1500	29.7
North Fork Leatherwood Creek	TN06040005548_0100	11.0
Panther Creek	TN06040005504_1000	8.5
Ramble Creek	TN06040005027_0100	26.3
Roan Creek	TN06040005032_1100	20.2
Scarce Creek	TN06040005032_0500	17.3
Standing Rock Creek	TN06040005065_1000	22.3
Sulphur Creek	TN06040005932_1000	14.0
Sycamore Creek	TN06040005047_0600	21.5
Trace Creek	TN06040005050_1000	4.3
Trace Creek	TN06040005050_3000	8.8
Turkey Creek	TN06040005047_0900	7.3
Watson Creek	TN06040005027_0600	3.2
Whiteoak Creek	TN06040005059_1000	14.4
Whiteoak Creek	TN06040005059_2000	13.2
Wolf Creek	TN06040005047_0500	10.3

Table A3-1a. Streams Fully Supporting Designated Uses in the Tennessee Portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Big Beaver Creek	TN06040005032_0700	18.1
Big Sandy River	TN06040005027_1000	27.7
Big Sandy River	TN06040005032_1000	7.3
Big Sandy River	TN06040005032_2000	12.5
Clifty Creek	TN06040005023_0500	15.8
Dry Creek	TN06040005027_0300	17.8
Fourteen Creek	TN06040005047_0800	20.7
Holly Fork Creek	TN06040005024_1000	13.8
Maple Creek	TN06040005032_0150	4.0
Mud Creek	TN06040005032_0900	24.9
Trace Creek	TN06040005050_2000	8.4
West Sandy Creek	TN06040005023_1000	15.0

Table A3-1b. Streams Partially Supporting Designated Uses in the Tennessee portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Little Beaver Creek	TN06040005032_0710	5.9

Table A3-1c. Streams Not Supporting Designated Uses in the Tennessee Portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Allen Creek	TN06040005027_1400	9.3
Bacon Creek	TN06040005032_1200	19.3
Ball Creek	TN06040005027_1100	8.3
Barnes Fork Creek	TN06040005023_0400	22.3
Bateman Branch	TN06040005059_0700	3.6
Beasley Creek	TN06040005023_0200	6.6
Beaverdam Creek	TN06040005087_1000	14.9
Big Sandy Embayment Misc. Tribs	TN06040005038T_1000	57.7
Brit Creek	TN06040005032_0800	5.7
Brushy Branch	TN06040005024_0600	8.1
Burnside Creek	TN06040005870_0300	11.3
Cane Creek	TN06040005870_0200	10.0
Caney Branch	TN06040005047_0400	7.0
Charlie Creek	TN06040005870_0210	4.6
Cherry Branch	TN06040005027_0210	3.4
Conley Branch	TN06040005047_0300	4.3
Conley Branch	TN06040005050_0100	3.7
Cotton Creek	TN06040005027_0800	16.7
Dancer Branch	TN06040005059_0100	7.0

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Dry Creek	TN06040005052_1000	9.6
Dry Creek	TN06040005978_1000	4.7
Frank Branch	TN06040005059_0200	5.1
Gander Branch	TN06040005059_1100	3.3
Gin Creek	TN06040005027_1700	8.2
Gravelly Run	TN06040005059_0800	5.1
Green Hatley Creek	TN06040005047_0200	2.8
Half Pone Branch	TN06040005059_0600	5.9
Halls Creek	TN06040005056_0100	12.3
Harmon Creek	TN06040005913_1000	0.6
Hauk Hatley Creek	TN06040005047_0100	2.2
Hawley Creek	TN06040005870_0400	2.8
Henson Branch	TN06040005024_0300	6.5
Horn Creek	TN06040005032_0200	13.5
Hunting Creek	TN06040005027_0700	11.4
Kentucky Reservoir Misc. Tribs.	TN06040005020T_1000	225.8
Lewis Branch	TN06040005059_0300	16.4
Little Sulphur Creek	TN06040005932_0100	5.7
Little Turkey Creek	TN06040005075_0300	3.3
Lost Creek	TN06040005510_1000	5.9
McGhee Branch	TN06040005019_0400	3.2
Middle Brook	TN06040005870_0100	6.5
Middle Fork Blood River	TN06040005019_0310	5.6
Misc tribs to Big Sandy River	TN06040005027_0999	77.6
Misc. tribs to Big Richland Creek	TN06040005056_0999	35.4
Misc. tribs to Big Sandy River	TN06040005032_0999	25.4
Misc. tribs to Birdsong Creek	TN06040005047_0999	18.0
Misc. tribs to Blood River	TN06040005019_0999	24.7
Misc. tribs to Cypress Creek	TN06040005870_0999	11.9
Misc. tribs to Holly Fork Creek	TN06040005024_0999	23.8
Misc. tribs to Trace Creek	TN06040005050_0999	29.5
Misc. tribs to West Sandy Creek	TN06040005023_0999	26.3
Misc. tribs to Whiteoak Creek	TN06040005059_0999	65.7
Moore Creek	TN06040005027_1200	10.1
Morris Creek	TN06040005032_0300	21.6
Nelson Creek	TN06040005024_0500	9.1
North Fork Blood River	TN06040005019_0300	17.1
North Fork Eagle Creek	TN06040005098_0200	4.8
North Fork Harmon Creek	TN06040005913_0200	11.3
North Fork Hurricane Creek	TN06040005063_0100	5.2
Olive Branch	TN06040005032_0600	9.2
Palmer Branch	TN06040005065_0200	5.8
Peach Creek	TN06040005059_0900	4.4
Pennywinkle Branch	TN06040005059_1200	2.1
Pinhook Branch	TN06040005059_0500	10.2
Rabbit Creek	TN06040005019_0100	4.1

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Ribbon Branch	TN06040005065_0100	6.0
Rushing Creek	TN06040005027_0200	40.3
South Fork Blood River	TN06040005019_0200	5.0
South Fork Cane Creek	TN06040005061_0100	5.0
South Fork Crooked Creek	TN06040005948_0100	2.8
South Fork Eagle Creek	TN06040005098_0100	10.6
South Fork Harmon Creek	TN06040005913_0100	11.6
South Fork Hurricane Creek	TN06040005063_0200	6.4
Spring Creek	TN06040005023_0300	23.2
Spring Creek	TN06040005056_0200	5.6
Springville Branch	TN06040005023_0100	4.2
Sugar Creek	TN06040005978_0100	8.5
Sykes Branch	TN06040005075_0100	3.2
Terrapin Run	TN06040005065_0300	4.6
Thompson Creek	TN06040005024_0400	12.4
Town Creek	TN06040005024_0110	24.6
Traylor Branch	TN06040005075_0200	3.7
Turkey Creek	TN06040005075_1000	9.4
Turkeypen Creek	TN06040005024_0200	7.6
West Fork Birdsong Creek	TN06040005047_0700	10.1

Table A3-1d. Streams Not Assessed in the Tennessee Portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
Big Sandy Embayment	TN06040005038_1000	500
Lower Kentucky Reservoir	TN06040005020_1000	99,500

Table A3-1e. Lakes Fully Supporting Designated Uses in the Tennessee Portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)	SUPPORT DESCRIPTION
Big Beaver Creek	TN06040005032_0700	18.1	Partial
Big Sandy River	TN06040005027_1000	27.7	Partial
Dry Creek	TN06040005027_0300	17.8	Partial
Holly Fork Creek	TN06040005024_1000	13.8	Partial
Little Beaver Creek	TN06040005032_0710	5.9	Not supporting
Trace Creek	TN06040005050_2000	8.4	Partial
West Sandy Creek	TN06040005023_1000	15.0	Partial

Table A3-2a. Stream Impairment Due to Other Habitat Alterations in the Tennessee Portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)	SUPPORT DESCRIPTION
Big Sandy River	TN06040005032_1000	7.3	Partial
Big Sandy River	TN06040005032_2000	12.5	Partial
Clifty Creek	TN06040005023_0500	15.8	Partial
Fourteen Creek	TN06040005047_0800	20.7	Partial
Holly Fork Creek	TN06040005024_1000	13.8	Partial
Mud Creek	TN06040005032_0900	24.9	Partial
Trace Creek	TN06040005050_2000	8.4	Partial

Table A3-2b. Stream Impairment due to Organic Enrichment/Low Dissolved Oxygen in the Tennessee Portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)	SUPPORT DESCRIPTION
Big Sandy River	TN06040005027_1000	27.7	Partial
Dry Creek	TN06040005027_0300	17.8	Partial
Fourteen Creek	TN06040005047_0800	20.7	Partial
Trace Creek	TN06040005050_2000	8.4	Partial
West Sandy Creek	TN06040005023_1000	15.0	Partial

Table A3-2c. Stream Impairment Due to Siltation in the Tennessee Portion of the Western Valley (KY Lake) Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)	SUPPORT DESCRIPTION
Big Sandy River	TN06040005032_1000	7.3	Partial
Big Sandy River	TN06040005032_2000	12.5	Partial
Holly Fork Creek	TN06040005024_1000	13.8	Partial
Little Beaver Creek	TN06040005032_0710	5.9	Not supporting
Mud Creek	TN06040005032_0900	24.9	Partial

Table A3-2d. Stream Impairment Due to Pathogens in the Tennessee Portion of the Western Valley (KY Lake) Watershed

APPENDIX IV

LAND USE/LAND COVER	AREAS IN HUC-10 SUBWATERSHEDS (ACRES)			
	01	02	03	04
Bare Rock/Sand/Clay	79			228
Deciduous Forest	151,625	38,535	53960	102,428
Emergent Herbaceous Wetlands	1,803	720	80	83
Evergreen Forest	5,235	3,054	226	3,736
High Intensity: Commercial/Industrial/Transportation	2,054	110	59	390
High Intensity: Residential	339		2	44
Low Intensity: Residential	2,774	10	21	215
Mixed Forest	8,322	3,592	1,185	3,372
Open Water	29,909	412	910	23,034
Other Grasses: Urban/Recreational	823	2	12	192
Pasture/Hay	15,317	4,386	5,369	4,747
Row Crops	16,432	3,698	4,853	4,467
Transitional	3,632	989	1,574	3,573
Woody Wetlands	8,462	1,343	58	625
Quarries/Strip Mines/Gravel Pits	490			39
Total	**247,298**	**56,851**	**68,309**	**147,172**

LAND USE/LAND COVER	AREAS IN HUC-10 SUBWATERSHEDS (ACRES)			
	05	06	07	08
Bare Rock, Sand/Clay		525	25	
Deciduous Forest	59,471	56,252	32,177	11,207
Emergent Herbaceous Wetlands		35	151	
Evergreen Forest	17,199	7,312	2,257	518
High Intensity: Commercial/Industrial/Transportation	305	234	1,071	2
High Intensity: Residential	42	55	409	1
Low Intensity: Residential	822	412	2,131	6
Mixed Forest	14,628	8,994	5,918	1,061
Open Water	623	12,891	209	37
Other Grasses: Urban/Recreational	8	90	60	
Pasture/Hay	30,884	25,044	24,309	6,361
Row Crops	23,022	16,940	13,630	4,780
Small Grains	108			
Transitional	747	461	171	20
Woody Wetlands	8,654	6,394	9,891	1,055
Quarries/Strip Mines/Gravel Pits	289		10	
Total	**156,801**	**135,638**	**92,420**	**25,048**

Table A4-1. Land Use Distribution in the Tennessee Portion of the Tennessee Western Valley (KY Lake) 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	STREAM NAME	AREA (SQ MILES)	LOW FLOW (CFS)		
					1Q10	7Q10	3Q20
03605000	0604000501	USGS	Tennessee River				
03605078	0604000501	USGS	Cypress Creek	27.3			
03605100	0604000501	USGS	Tennessee River				
03605500	0604000501	USGS	Trace Creek	20.1	0.64	0.68	0.57
03605555	0604000501	USGS	Trace Creek	31.9	4.28	4.68	3.94
03605700	0604000501	USGS	Deer Creek Tributary				
03606000	0604000501	USGS	Tennessee River				
360104088001101	0604000501	TVA	Tennessee River				
03604800	0604000502	USGS	Birdsong Creek	44.9	0	0	0
03607500	0604000504	USGS	Tennessee River	39,730			
03606350	0604000505	USGS	Big Sandy River	110	18.2	19.2	17.2
03606500	0604000505	USGS	Big Sandy River	205	34.8	36.2	32.6
360219088134201	0604000505	TVA	Big Sandy River				
03607000	0604000506	USGS	Big Sandy River	379	45	49	44
03607274	0604000507	USGS	Bailey Fork Creek				

Table A4-3. Historical Streamflow Data Summary Based on Mean Daily Flows in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed*. USGS, United States Geological Survey; TVA, Tennessee Valley Authority. Additional information may be found at* http://nwis.waterdata.usgs.gov/tn/nwis/discharge

AGENCY	STATION	ALIAS	LOCATION	HUC-10
TDEC	BEAVE002.5BN		Beaverdam Creek @ RM 2.5	0604000501
TDEC	BRICH004.7HU		Big Richland Creek @ RM 4.7	0604000501
TDEC	CANE002.5HO		Cane Creek @ RM 2.5	0604000501
TDEC	TENNE107.8HU	003490	Tennessee River @ RM 107.8	0604000501
TDEC	TENNE101.5SU	003500	Tennessee River @ RM 101.5	0604000501
TDEC	TENNE100.4HU	003510	Tennessee River @ RM 100.4	0604000501
TDEC	TENNE099.6HU	003520	Tennessee River @ RM 99.6	0604000501
TDEC	TENNE098.5HU	003530	Tennessee River @ RM 98.5	0604000501
TDEC	TENNE098.0HU	003540	Tennessee River @ RM 98.0	0604000501
TDEC	TENNE097.0HU	003550	Tennessee River @ RM 97.0	0604000501
TDEC	TENNE096.1HU	003560	Tennessee River @ RM 96.1	0604000501
TDEC	TENNE095.6HU	003570	Tennessee River @ RM 95.6	0604000501
TDEC	TENNE095.0HU	003580	Tennessee River @ RM 95.0	0604000501
TDEC	TENNE089.0HU	003610	Tennessee River @ RM 89.0	0604000501
TDEC	TENNE008.3HU	003620	Tennessee River @ RM 88.5	0604000501
TDEC	TENNE078.3HU	003630	Tennessee River @ RM 78.3	0604000501
TDEC	TRACE016.0HU		Trace Creek @ RM 16.0	0604000501
TDEC	TRACE007.2HU		Trace Creek @ RM 7.2	0604000501
TDEC	CYPRE1T0.1BN		UT To Cypress Creek @ RM 0.1	0604000501
TVA	475694		Cane Creek @ RM 0.25	0604000501
TVA	476180		Cane Creek @ RM 0.6	0604000501
TVA	475695		Cane Creek @ RM 1.0	0604000501
TVA	476149		Crooked Creek @ RM 3.8	0604000501
TVA	475591		Fowlkes Branch @ RM 0.2	0604000501
TVA	475863		Indian Creek @ RM 0.3	0604000501
TVA	475074		Indian Creek @ RM 0.4	0604000501
TVA	475075		Indian Creek @ RM 0.5	0604000501
TVA	475590		Indian Creek @ RM 0.6	0604000501
TVA	111190		Kentucky Lake	0604000501
TVA	111192		Kentucky Lake	0604000501
TVA	475076		Simmons Branch @ RM 0.3	0604000501
TVA	476089		Tennessee River @ RM 100.0	0604000501
TVA	475799		Tennessee River @ RM 100.4	0604000501
TVA	476999		Tennessee River @ RM 100.4	0604000501
TVA	475588		Tennessee River @ RM 100.5	0604000501
TVA	476090		Tennessee River @ RM 100.6	0604000501
TVA	476945		Tennessee River @ RM 100.6	0604000501
TVA	475589		Tennessee River @ RM 101.5	0604000501
TVA	475016		Tennessee River @ RM 102.0	0604000501
TVA	475073		Tennessee River @ RM 102.4	0604000501
TVA	475809		Tennessee River @ RM 102.5	0604000501
TVA	477007		Tennessee River @ RM 103.7	0604000501
TVA	475090		Tennessee River @ RM 104.0	0604000501
TVA	475722		Tennessee River @ RM 105.0	0604000501

AGENCY	STATION	ALIAS	LOCATION	HUC-10
TVA	475835		Tennessee River @ RM 107.0	0604000501
TVA	475091		Tennessee River @ RM 108.0	0604000501
TVA	477000		Tennessee River @ RM 110.0	0604000501
TVA	476144		Tennessee River @ RM 77.8	0604000501
TVA	475725		Tennessee River @ RM 78.0	0604000501
TVA	477403		Tennessee River @ RM 85.0	0604000501
TVA	476145		Tennessee River @ RM 85.2	0604000501
TVA	475807		Tennessee River @ RM 86.0	0604000501
TVA	475018		Tennessee River @ RM 91.0	0604000501
TVA	476379		Tennessee River @ RM 91.5	0604000501
TVA	476998		Tennessee River @ RM 91.5	0604000501
TVA	475584		Tennessee River @ RM 94.0	0604000501
TVA	475585		Tennessee River @ RM 95.0	0604000501
TVA	477098		Tennessee River @ RM 95.6	0604000501
TVA	475586		Tennessee River @ RM 95.66	0604000501
TVA	476200		Tennessee River @ RM 96.20	0604000501
TVA	475724		Tennessee River @ RM 96.7	0604000501
TVA	477005		Tennessee River @ RM 96.9	0604000501
TVA	477139		Tennessee River @ RM 97.0	0604000501
TVA	477006		Tennessee River @ RM 97.2	0604000501
TVA	475808		Tennessee River @ RM 97.5	0604000501
TVA	475444		Tennessee River @ RM 97.7	0604000501
TVA	475587		Tennessee River @ RM 98.5	0604000501
TVA	476224		Tennessee River @ RM 98.8	0604000501
TVA	476088		Tennessee River @ RM 99.2	0604000501
TVA	475723		Tennessee River @ RM 99.5	0604000501
TVA	476256		Tennessee River @ RM 99.6	0604000501
TVA	475693		Trace Creek @ RM 11.4	0604000501
TVA	475688		Trace Creek @ RM 2.6	0604000501
TVA	475689		Trace Creek @ RM 4.5	0604000501
TVA	475732		Trace Creek @ RM 5.1	0604000501
TVA	475690		Trace Creek @ RM 5.9	0604000501
TVA	475731		Trace Creek @ RM 6.0	0604000501
TVA	475730		Trace Creek @ RM 6.4	0604000501
TVA	475691		Trace Creek @ RM 6.9	0604000501
TVA	475729		Trace Creek @ RM 7.3	0604000501
TVA	475728		Trace Creek @ RM 7.6	0604000501
TVA	475727		Trace Creek @ RM 7.8	0604000501
TVA	475734		Trace Creek @ RM 8.2	0604000501
TVA	475692		Trace Creek @ RM 9.3	0604000501
TVA	475726		Trace Creek @ RM 9.8	0604000501
TVA	476181		Whiteoak Creek @ RM 1.0	0604000501
USEPA	210409			0604000501
USEPA	210410			0604000501

AGENCY	STATION	ALIAS	LOCATION	HUC-10
USEPA	210411			0604000501
USEPA	210417			0604000501
USEPA			Beaverdam Creek	0604000501
USEPA			Big Richland Creek	0604000501
USEPA			Burnside Creek	0604000501
USEPA			Cane Creek	0604000501
USEPA			Crooked Creek	0604000501
USEPA			Cypress Creek	0604000501
USEPA			Harmon Creek	0604000501
USEPA			Little Richland Creek	0604000501
USEPA	210451		North Indian Creek	0604000501
USEPA			Sulphur Creek	0604000501
USEPA			Tennessee River	0604000501
USEPA			Trace Creek	0604000501
TDEC	BIRDS013.9BN		Birdsong Creek @ RM 13.9	0604000502
TDEC	LBIRD000.6BN		Little Birdsong Creek @ RM 0.6	0604000502
TDEC	WOLF001.4BN		Wolf Creek @ RM 1.4	0604000502
TDEC	WHITE006.7HO		Whiteoak Creek @ RM 6.7	0604000503
TVA	476179		Crooked Creek @ RM 0.5	0604000503
USEPA			Whiteoak Creek	0604000503
TDEC	EAGLE002.9HN		Eagle Creek @ RM 2.9	0604000504
TDEC			Kentucky Lake-Paris Landing Area	0604000504
TDEC	LICK002.5BN		Lick Creek @ RM 2.5	0604000504
TDEC	PANTH003.6ST		Panther Creek @ RM 3.6	0604000504
TDEC	TENNE065.6ST	003660	Tennessee River @ RM 65.6	0604000504
TDEC	TENNE066.3HN		Tennessee River @ RM 66.3	0604000504
TVA	476942		Eagle Creek @ RM 1.0	0604000504
TVA	476178		Hurricane Creek @ RM 0.7	0604000504
TVA	476176		Leatherwood Creek @ RM 0.7	0604000504
TVA	476148		Lick Creek @ RM 1.90	0604000504
TVA	477250		Little Eagle Creek @ RM 0.7	0604000504
TVA	476183		Robbins Creek @ RM 0.2	0604000504
TVA	476182		Standing Rock Creek @ RM 0.6	0604000504
TVA	476939		Tennessee River @ RM 49.9	0604000504
TVA	477097		Tennessee River @ RM 59.7	0604000504
TVA	477140		Tennessee River @ RM 61.0	0604000504
TVA	477083		Tennessee River @ RM 62.37	0604000504
TVA	477003		Tennessee River @ RM 62.4	0604000504
TVA	477010		Tennessee River @ RM 62.5	0604000504
TVA	476996		Tennessee River @ RM 62.6	0604000504
TVA	476940		Tennessee River @ RM 63.7	0604000504
TVA	477011		Tennessee River @ RM 64.4	0604000504
TVA	476142		Tennessee River @ RM 65.6	0604000504
TVA	475441		Tennessee River @ RM 66.0	0604000504

AGENCY	STATION	ALIAS	LOCATION	HUC-10
TVA	476941		Tennessee River @ RM 66.3	0604000504
TVA	477045		Tennessee River @ RM 70.0	0604000504
TVA	477046		Tennessee River @ RM 72.0	0604000504
TVA	477050		Tennessee River @ RM 72.2	0604000504
TVA	477004		Tennessee River @ RM 72.6	0604000504
TVA	477047		Tennessee River @ RM 74.0	0604000504
TVA	476143		Tennessee River @ RM 74.2	0604000504
TVA	476177		Unnamed Tributary @ RM 0.1	0604000504
USEPA			Eagle Creek	0604000504
USEPA			Hurricane Creek	0604000504
USEPA	210405		Kentucky Lake	0604000504
USEPA	210406		Kentucky Lake	0604000504
USEPA			Leatherwood Creek	0604000504
USEPA			Standing Rock Creek	0604000504
TDEC	BACON002.5CR		Bacon Creek @ RM 2.5	0604000505
TDEC	BBEAV000.8HE		Big Beaver Creek @ RM 0.8	0604000505
TDEC	BSAND031.5CR	000310	Big Sandy River @ RM 31.5	0604000505
TDEC	BSAND031.3BN	000320	Big Sandy River @ RM 31.3	0604000505
TDEC	BSAND016.6CR	000325	Big Sandy River @ RM 16.6	0604000505
TDEC	BSAND029.7CR		Big Sandy River @ RM 29.7	0604000505
TDEC	BSAND036.4CR		Big Sandy River @ RM 36.4	0604000505
TDEC	BSAND045.2CR		Big Sandy River @ RM 45.2	0604000505
TDEC	BSAND052.9HE		Big Sandy River @ RM 52.9	0604000505
TDEC	BSAND056.0HE	BIGSANDY056.0	Big Sandy River @ RM 56.0	0604000505
TDEC	BRITT001.2BN		Britton Creek @ RM 1.2	0604000505
TDEC	HUNTI003.2CR		Hunting Creek @ RM 3.2	0604000505
TDEC	LBACO001.5CR		Little Bacon Creek @ RM 1.5	0604000505
TDEC	LBEAV001.3HE		Little Beaver Creek @ RM 1.3	0604000505
TDEC	MAPLE000.6CR		Maple Creek @ RM 0.6	0604000505
TDEC	MAPLE006.0CR		Maple Creek @ RM 6.0	0604000505
TDEC	MUD004.7CR		Mud Creek @ RM 4.7	0604000505
TDEC	ROAN002.7CR		Roan Creek @ RM 2.7	0604000505
TDEC	SCARC001.0HE		Scarce Creek @ RM 1.0	0604000505
TDEC	WATSO000.9BN		Watson Creek @ RM 0.9	0604000505
TVA	477205		Bacon Creek @ RM 0.9	0604000505
TVA	477209		Big Beaver Creek @ RM 0.95	0604000505
TVA	476052		Big Sandy River @ RM 31.6	0604000505
TVA	477211		Big Sandy River @ RM 31.78	0604000505
TVA	477206		Big Sandy River @ RM 47.2	0604000505
TVA	477203		Blunt Creek @ RM 0.05	0604000505
TVA	477208		Dabbs Creek @ RM 1.1	0604000505
TVA	477204		Maple Creek @ RM 0.6	0604000505
TVA	477254		Maple Creek @ RM 5.85	0604000505
TVA	477207		Mud Creek @ RM 3.85	0604000505

AGENCY	STATION	ALIAS	LOCATION	HUC-10
USEPA	210461		Cherry Lake	0604000505
TDEC	BSAND013.2BN	000330	Big Sandy River @ RM 13.2	0604000506
TDEC	BSAND015.3BN	000335	Big Sandy River @ RM 15.3	0604000506
TDEC	WSAND004.4HN		West Sandy Creek @ RM 4.4	0604000506
TVA	477198		Bear Creek @ RM 0.9	0604000506
TVA	475865		Big Sandy River @ RM 15.0	0604000506
TVA	475397		Big Sandy River @ RM 15.2	0604000506
TVA	476146		Big Sandy River @ RM 5.0	0604000506
TVA	477188		Big Sandy River @ RM 10.4	0604000506
TVA	476997		Big Sandy River @ RM 11.0	0604000506
TVA	476944		Big Sandy River @ RM 14.5	0604000506
TVA	477200		Big Sandy River @ RM 14.9	0604000506
TVA	477141		Big Sandy River @ RM 4.0	0604000506
TVA	477565		Big Sandy River @ RM 5.0	0604000506
TVA	477210		Big Sandy River @ RM 7.4	0604000506
TVA	476147		Lick Creek @ RM 0.6	0604000506
TVA	477196		Lick Creek @ RM 0.9	0604000506
TVA	477197		Martin Creek @ RM 2.55	0604000506
TVA	477199		Ramble Creek @ RM 1.0	0604000506
TVA	477189		West Sandy Creek @ RM 0.1	0604000506
TVA	477190		West Sandy Creek @ RM 1.1	0604000506
TVA	477191		West Sandy Creek @ RM 2.3	0604000506
TVA	477192		West Sandy Creek @ RM 3.0	0604000506
TVA	476943		West Sandy Creek @ RM 3.4	0604000506
TVA	477193		West Sandy Creek @ RM 3.5	0604000506
USEPA			Big Sandy River	0604000506
USEPA	210407		Kentucky Lake	0604000506
USEPA	210408		Kentucky Lake	0604000506
USEPA			West Sandy Creek	0604000506
TDEC	BFORK005.1HN	BAILE005.1HN	Bailey Fork Creek @ RM 5.1	0604000507
TDEC	CLIFT002.1HN		Clifty Creek @ RM 2.1	0604000507
TDEC	HFORK004.0HN	HOLLE004.0HN	Holley Fork Creek @ RM 4.0	0604000507
TDEC	STOWN001.34HN	0002660	Smith Town Creek @ RM 1.4	0604000507
TDEC	WSAND010.5HN		West Sandy Creek @ RM 10.5	0604000507
TDEC	3050	WSAND004.3HN	West Sandy Creek @ RM 4.3	0604000507
TDEC	WSAND008.2HN		West Sandy Creek @ RM 8.2	0604000507
TVA	475347		Bailey Fork Creek @ RM 4.75	0604000507
TVA	477212		Bailey Fork Creek @ RM 6.3	0604000507
TVA	475312		Bailey Fork Creek @ RM 7.42	0604000507
TVA	475271		Bailey Fork Creek @ RM 8.63	0604000507
TVA	477202		Clifty Creek @ RM 2.3	0604000507
TVA	475387		Clifty Creek @ RM 2.33	0604000507
TVA	475353		Clifty Creek @ RM 4.78	0604000507
TVA	477195		Holly Fork Creek @ RM 4.0	0604000507

AGENCY	STATION	ALIAS	LOCATION	HUC-10
TVA	475239		Jones Bend Creek @ RM 0.21	0604000507
TVA	475238		Jones Bend Creek @ RM 0.71	0604000507
TVA	475145		Jones Bend Creek @ RM 1.23	0604000507
TVA	111186		Paris Landing State Park	0604000507
TVA	475243		Town Creek @ RM 0.48	0604000507
TVA	475242		Town Creek @ RM 1.16	0604000507
TVA	475288		Unnamed Tributary @ RM 0.5	0604000507
TVA	475348		Unnamed Tributary @ RM 0.5	0604000507
TVA	477194		West Sandy Creek @ RM 3.6	0604000507
TVA	477201		West Sandy Creek @ RM 8.2	0604000507
USEPA	210431		Bailey Fork Creek	0604000507
USEPA	210432		Bailey Fork Creek	0604000507
USEPA	210441		Clifty Creek	0604000507
USEPA	210421		Town Creek	0604000507

Table A4-4. STORET Water Quality Monitoring Stations in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed*. RM, River Mile; TDEC, Tennessee Department of Environment and Conservation; USEPA, United States Environmental Protection Agency; TVA, Tennessee Valley Authority. UT, Unnamed Tributary.*

FACILITY NUMBER	FACILITY NAME	SIC	SIC NAME	MADI	WATERBODY	HUC-10
TN0064611	Camden Waste Water Treatment Plant	4952	Sewerage System	Minor	Cypress Creek @ RM 12.6	0604000501
TN0028631	Mid Valley Pipeline Co.	4612	Crude Petroleum	Minor	Indian Creek to KY Lake	0604000501
TN0024830	Waverly Lagoon	4952	Sewerage System	Minor	Trace Creek @ RM 8.3	0604000501
TN0064734	Mark I Molded Plastics	3081	Unsupported Plastic Profile Sheet	Minor	Surface Discharge to Gravel Park	0604000501
TN0002763	Inland Paperboard and Packaging	2611	Pulp Mills	Major	KY Lake (Tennessee River) @ RM 94.4	0604000501
TN0002526	Scepter, Incorporated	3334	Primary Aluminum Production	Minor	Tennessee River @ RM 95.5	0604000501
TN0062537	Chemetall Foote, Corp.	2869	Industrial Organic Chemicals	Minor	WWC to Indian Creek Embayment of Tennessee River	0604000501
TN0001465	E.I. Dupont de Nemours and Company	2816	Inorganic Pigments	Major	Tennessee River @ RM 98.2	0604000501
TN0041157	Lakeshore United Methodist Assembly	4952	Sewerage System	Minor	Tennessee River @ RM 96.0	0604000501
TN0062006	New Johnsonville Lagoon	4952	Sewerage System	Minor	Tennessee River @ RM 101.6	0604000501
TN0001686	Erachem Comilog, Inc.	3313	Electrometallurgical Products	Minor	KY Lake (Tennessee River) @ RM 101.8	0604000501
TN0020249	Piney Campground	4952	Sewerage System	Minor	KY Lake (Tennessee River) @ RM 62.2	0604000504
TN0075990	Paris Landing State Park	7999	Amusement and Recreation	Minor	Eagle Creek	0604000504
TN0062014	Bruceton Wastewater Lagoon	4952	Sewerage System	Minor	Big Sandy River @ RM 31.0	0604000505
TN0023141	Paris Landing State Park STP	4952	Sewerage System	Minor	KY Lake (Tennessee River) @ RM 66.0	0604000506
TN0062430	Paris Landing State Park Public School	8412	Museum and Art Gallery	Minor	Embayments of KY Lake (Tennessee River) @ RM 66.0	0604000506
TN0022616	Big Sandy STP	4952	Sewerage System	Minor	Big Sandy River @ RM 15.0	0604000506
TN0061271	Paris STP	4952	Sewerage System	Major	UT @ RM 0.5 to Bailey Fork Creek @ RM 6.2	0604000507

Table A4-5. NPDES Permittees in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *RM, River Mile; SIC, Standard Industrial Classification; MADI, Major Discharge Indicator; UT, Unnamed Tributary; WWC, Wet Weather Conveyance.*

FACILITY NUMBER	PERMITEE	SIC	SIC NAME	WATERBODY	HUC-10
TN0070980	Camden Gravel Company (Camden Pit)	1442	Construction Sand and Gravel	Cypress Creek	0604000501
TN0071382	Camden Gravel Company (Camden Pit #2)	1442	Construction Sand and Gravel	UT to Cypress Creek	0604000501
TN0072788	Camden Gravel Company (Camden Pit #3)	1442	Construction Sand and Gravel	UT to Cypress Creek	0604000501
TN0066133	Ford Construction Company (Camden/Memphis Stone Pit)	1442	Construction Sand and Gravel	Cypress Creek	0604000501
TN0047716	Sangravl Company (New Jonsonville Facility)	1442	Construction Sand and Gravel	Tennessee River	0604000501
TN0069078	Camden Gravel Company (Carroll Site)	1442	Construction Sand and Gravel	Ammon Creek	0604000502
TN0066184	Teague Transports (Benton County Chert Mine)	1442	Construction Sand and Gravel	UT to Ammon Creek	0604000502
TN0003107	Vulcan Construction Materials (Benton County Quarry)	1422	Limestone-Crushed and Broken	Wolf Creek and Little Wolf Creek	0604000502
TN0070785	J.R. Hayes Construction Co. (Mine #2)	1422	Construction Sand and Gravel	South Fork Eagle Creek	0604000504
TN0071200	J.R. Hayes Construction Co. (Mine #4)	1446	Construction Sand and Gravel	South Fork Eagle Creek	0604000504
TN0001881	Unimin Corporation (Plant #3)	1446	Industrial Sand	UT to Hunting Creek	0604000505
TN0066532	Unimin Corporation (B-2 Mine and Reservoir/Classifier)	1442	Industrial Sand	UT(s) to Abbott Branch, Pond Creek, Cotton Creek, Big Sandy River, Hunting Creek, and Green Creek	0604000505
TN0072320	Benton County Highway Department (Benton County Gravel Pit)	1442	Construction Sand and Gravel	UT to Ramble Creek	0604000506
TN0070947	M&M Gravel Company (Sulfur Creek Road Mine)	1442	Construction Sand and Gravel	Jones Branch	0604000506
TN0072427	Marty Allison (Sand and Gravel Mine)	1099	Construction Sand and Gravel	UT to Swamp Creek	0604000506
TN0072486	Mineral Recovery Systems (Camden Pilot Plant)	1442	Miscellaneous Metal Ores	UT to Dry Creek	0604000506
TN0072010	North Benton Gravel (Big Sandy Mine)	1442	Construction Sand and Gravel	UT to Ramble Creek	0604000506
TN0060348	Tennessee Asphalt Company (South Fork Plant)	1442	Construction Sand and Gravel	South Fork Eagle Creek	0604000506
TN0045233	American Colloid Company (Mine #2)	1459	Clay, Ceramic, and Refractory Minerals	Clifty Creek	0604000507
TN0071609	Henry County Highway Department (Kendall Pit)	1442	Construction Sand and Gravel	Beaverdam Creek and WWC to Beaverdam Creek	0604000507
TN0068985	J.R. Hayes Construction Company (Mine #3)	1442	Construction Sand and Gravel	Beaverdam Creek	0604000507

Table A4-6. Active Permitted Mining Sites in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *SIC, Standard Industrial Classification; UT, Unnamed Tributary; WWC, Wet Weather Conveyance.*

FACILITY NUMBER	FACILITY NAME	WATERBODY	HUC-10
TN0078000	City of Waverly WTP	No Receiving Stream	0604000501
TN0004740	Camden WTP	Lick Creek	0604000501

Table A4-7. Water Treatment Plants in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *SIC, Standard Industrial Classification; UT, Unnamed Tributary; WWC, Wet Weather Conveyance.*

FACILITY NUMBER	FACILITY NAME	WATERBODY	HUC-10
TNG110036	Mid-South Ready Mix	Trace Creek @ RM 13.4	0604000501
TNG110064	Volunteer Ready Mix	WWC to Indian Creek to Tennessee River (KY Lake) @ RM 101.0	0604000501
TNG110020	Mid-Way Materials	Cane Creek to Cypress Creek to KY Lake	0604000501
TNG110151	Southern Concrete Products	UT to Clifty Creek to Big Sandy River Embayment	0604000507
TNG110185	Federal Materials Concrete	Town Creek	0604000507

Table A4-8. Ready Mix Concrete Plants in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *RM, River Mile; UT, Unnamed Tributary; WWC, Wet Weather Conveyance.*

LOG NUMBER	COUNTY	DESCRIPTION	WATERBODY	HUC-10
NRS01.366	Benton	Filling (1.94 acres)	Cypress Creek	0604000501
NRS03.108	Humphreys	Plant Intake and Coal Barge Unloader	Tennessee River	0604000501
NRS03.284	Humphreys	SR-13 Bridge and Approaches	Big Richland Creek	0604000501
NRS03.340	Humphreys	Channel Relocation	Big Richland Creek	0604000501
NRS02.125	Humphreys	Rip-Rap	Spring Creek	0604000501
NRS00.391	Stewart	Box Culvert	Standing Rock Creek	0604000504
NRS00.048	Henderson	Bridge and 2 Box Culverts	UT to Big Sandy River	0604000504
NRS00.098	Henderson	Wetland Fill	Little Beaver Creek and UT to Big Sandy River	0604000505
NRS00.049	Henderson	Wetland Fill	UT to Big Sandy River	0604000505
NRS00.135	Carroll	Wetland Fill	Big sandy River	0604000505
NRS02.131	Henderson	Gravel Access	Big Sandy River	0604000505
NRS03.068	Henry	Boat launch Ramp Improvement	Big Sandy River	0604000506
NRS00.115	Henry	Channel Enlargement	UT to Bailey Fork Creek	0604000507
NRS01.185	Henry	Road Crossing	UT to Bailey Fork Creek	0604000507
NRS01.398	Henry	Wetland Fill	UT to West Sandy Creek	0604000507
NRS00.029	Henderson	Multiple Stream Crossings	Big Sandy River	0604000507

Table A4-9. Individual ARAP Permits Issued January 2000 Through June 2004 in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed Watershed. *UT, Unnamed Tributary.*

FACILITY NUMBER	FACILITY NAME	SECTOR	RECEIVING STREAM	AREA*	HUC-10
TNR053175	Benton County Airport	S	Cypress Creek	110.53	0604000501
TNR050540	Ward Oil Company	P	Whitfield Creek	1.2	0604000501
TNR053760	Carroll County Airport	S	None Directly	0.99	0604000501
TNR053229	Humphreys County Airport	S	Not Provided	0.99	0604000501
TNR053685	Aqua Glass Corporation Performance Plant	Y	Conley Branch	8.48	0604000501
TNR055033	Precision Machine, Inc.	AB, P	UT to Trace Creek	100	0604000501
TNR053821	Nashville Wire Products	AA	Conley Branch	14	0604000501
TNR055085	Volunteer Metal Systems	AA	Trace Creek	5	0604000501
TNR050510	Factory and Steele Transportation, Inc.	P	Trace Creek	0.6	0604000501
TNR054590	Valley West Welding Co.	AA	Trace Creek	0.77	0604000501
TNR051032	Inland Paperboard and Recycling	B, P, L	Little Dry Creek	688	0604000501
TNR053725	Scepter, Incorporated	F, L	Leach Creek and Tennessee River	20.5	0604000501
TNR050539	E.I. Dupont de Nemours and Company	C, P, L	Tennessee River and UT to Tennessee River	200	0604000501
TNR053188	TVA-Johnsonville Fossil Plant	O, L	Tennessee River @ RM 100.1, 100.2, and 100.4	300.2	0604000501
TNR055930	Bivens Industrial park	L	Cypress Creek	60	0604000501
TNR054025	Custom Tire and Recycle	L	Burnside Creek	29.9	0604000501
TNR054294	R&J Hardwoods Products	A	Cypress Creek	2	0604000501
TNR055949	H&H Oil Recovery	D, P	Cypress Creek	4.9	0604000501
TNR051869	Jones Plastic and Engineering	Y	UT to Middle Brook Creek	21.6	0604000501
TNR051529	West Camden Sanitary Landfill	L, P	UT to Cane Creek	490	0604000501
TNR053825	Dement Construction Co.	D	Eagle Creek, Riley Branch, UT to Eagle Creek, UT to Riley Branch	30	0604000502
TNR050237	Camden Hardwood Products	A	UT to Hunting Creek	13	0604000505
TNR054445	Cole Pallet Company	J	UT to Hunting Creek	1	0604000505
TNR056007	22 Auto Salvage	M	UT to Big Sandy River	7	0604000505
TNR053524	Big Sandy Woodyard		Lockhart Branch	11	0604000506
TNR053179	Tennessee Asphalt Co.	D	Eagle Creek	2	0604000506
TNR054319	Elliott Tool Company	AB	UT	1.3	0604000506
TNR054074	Dana Corporation-Hose and Tubing Products	Y	Bailey Fork Creek	3.4	0604000507
TNR053016	PML, Incorporated	Y, C, C	Bailey Fork Creek	10.3	0604000507
TNR053244	Milan Express Company	P	UT to Town Creek	3.2	0604000507
TNR051299	Tennessee Asphalt Co.	D	Not Identified	9	0604000507
TNR053558	United Parcel Service	P	UT to Clifty Creek	1.49	0604000507
TNR050437	Mohon International	W	Two Mile Branch of Town Creek	10	0604000507
TNR053922	The Berripatch, Inc.	W	Jones Bend Creek	10	0604000507

FACILITY NUMBER	FACILITY NAME	SECTOR	RECEIVING STREAM	AREA*	HUC-10
TNR053299	Paris-Henry County Landfill	L	UT to Jones Bend Creek	167	0604000507

Table A4-10. Active Permitted TMSP Facilities in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Area, acres of property associated with industrial activity; RM, River Mile; UT, Unnamed Tributary. Sector details may be found in Table A4-11.*

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

Table A4-11. TMSP Sectors and Descriptions.

APPENDIX V

CONSERVATION PRACTICE	AMOUNT	
	FEET	ACRES
Alley Cropping		
Contour Buffer Strips		
Crosswind Trap Strips		
Field Borders		
Filter Strips		49
Grassed Waterways		1
Hedgerow Plantings		
Herbaceous Wind Barriers		
Riparian Forest Buffers		22
Streambank and Shoreline Protection	1,880	
Windbreaks and Shelterbelts		
Total Conservation Buffers	**1,880**	**72**

Table A5-1a. Conservation Buffers Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) River Watershed. *Data are from Performance & Results Measurement System (PRMS) for October 1, 2003 through September 30, 2004 reporting period.*

NUTRIENT MANAGEMENT PLANS APPLIED	ACRES
Feed Management	0
Irrigation Management	0
Water Management	0
Nutrient Management	4,539
Waste Utilization	0

Table A5-1b. Nutrient Management Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period.*

CONSERVATION PRACTICE	FEET	ACRES
Diversion	1,200	
Grassed Waterway		1

Table A5-1c. Land Treatment: Surface Water Management Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period.*

PARAMETER	FEET	NUMBER
Pipeline	7,990	
Pond		
Spring Development		
Watering Facility		310

Table A5-1d. Water Supply Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period.*

CONSERVATION PRACTICE	NUMBER
Grade Stabilization Structure	20
Sediment Basin	3
Water and Sediment Control Basin	55

Table A5-1e. Water Detention/Retention Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period.*

PARAMETER	ACRES
Acres of Pest Management Systems Applied	4,182

Table A5-1f. Pest Management Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period.*

CONSERVATION PRACTICE	AMOUNT	
	Feet	**Acres**
Fence	84,281	
Firebreak		
Forest Harvest Management		1,152
Heavy Use Area Protection		325
Pasture and Hay Planting		173
Prescribed Grazing		1,564
Range Planting		
Use Exclusion		483
Pipeline	7,990	
Prescribed Burning		37
Total	**92,271**	**3,734**

Table A5-1g. Grazing/Forages Conservation Practices in Partnership with NRCS in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed. *Data are from PRMS for October 1, 2003 through September 30, 2004 reporting period.*

COMMUNITY	PROJECT DESCRIPTION	AWARD DATE	AWARD AMOUNT
Clarksburg	Gravity Sewer and Force Main from Clarksburg to Huntington	02/12/2004	$416,000

Table A5-2. Communities in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed Receiving SRF Grants or Loans.

PRACTICE	NRCS CODE	NUMBER OF BMPs
Conservation Cover	327	1
Critical Area Planting	342	3
Diversion	362	2
Fence	382	3
Grade Stabilization Structure	410	22
Grassed Waterway	412	1
Heavy Use Area	561	10
Land Smoothing	466	1
Pasture/Hay Planting	512	70
Pipeline	516	2
Pond	378	15
Streambank Protection	580	8
Water/Sediment Control Basin	638	8
Watering Facility	614	4

Table A5-3. Best Management Practices Installed by Tennessee Department of Agriculture and Partners in the Tennessee Portion of the Tennessee Western Valley (KY Lake) Watershed.