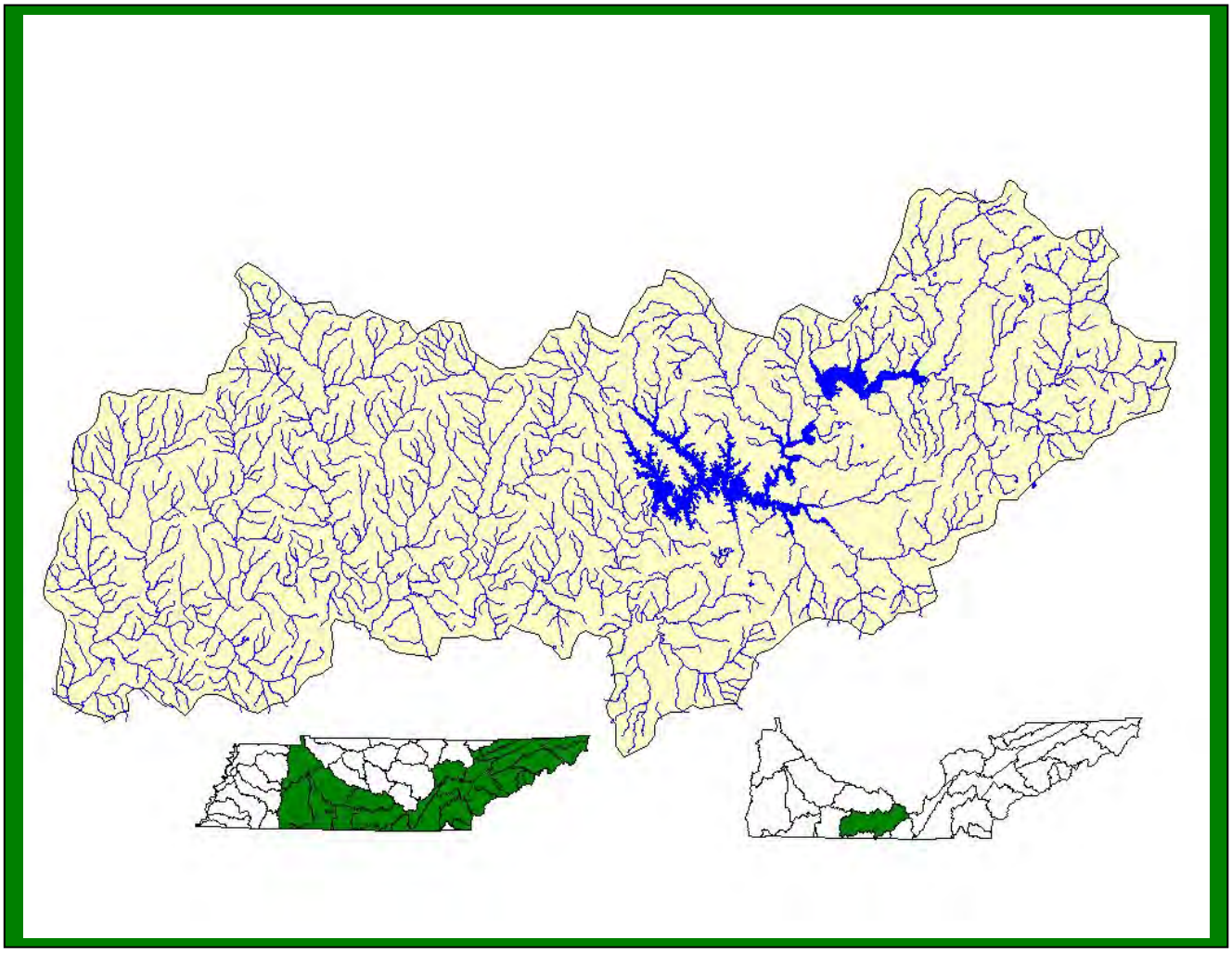
UPPER ELK RIVER WATERSHED (06030003) OF THE TENNESSEE RIVER BASIN

WATERSHED WATER QUALITY MANAGEMENT PLAN



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

GLOSSARY

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

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

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

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

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

AFO. Animal Feeding Operation.

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

ARAP. Aquatic Resource Alteration Permit.

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

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

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

Benthic. Bottom dwelling.

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

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

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

CAFO. Concentrated Animal Feeding Operation.

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

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

DO. Dissolved oxygen.

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

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

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

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

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

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

MRLC. Multi-Resolution Land Classification.

MS4. Municipal Separate Storm Sewer System.

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

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

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

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

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

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

SBR. Sequential Batch Reactor.

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

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

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

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

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

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

TMSP. Tennessee Multi-Sector Permit.

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

WAS. Waste Activated Sludge.

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

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

WET. Whole Effluent Toxicity.

WWTP. Waste Water Treatment Plant

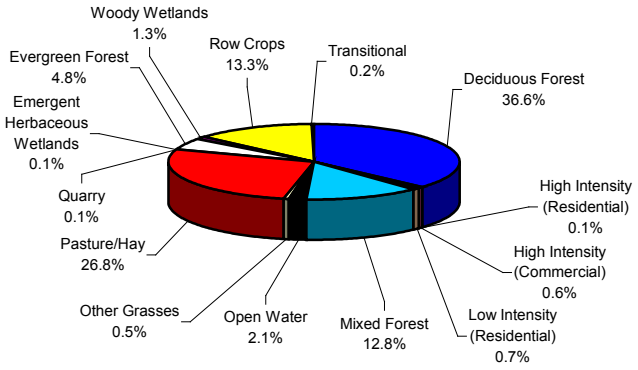
Summary – Upper Elk River

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

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

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

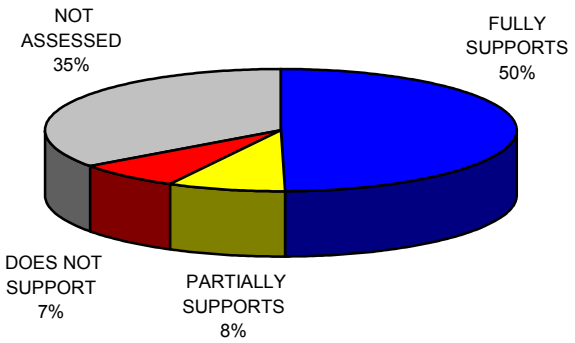
A detailed description of the watershed can be found in Chapter 2. The Upper Elk River Watershed is approximately 1,277 square miles and includes parts of eight Middle Tennessee counties. A part of the Tennessee River drainage basin, the watershed has 1,813 stream miles.



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

One Designated State Natural Areas, two interpretive areas, and one wildlife management area are located in the watershed. Eighty-seven rare plant and animal species have been documented in the watershed, including four rare fish species, thirteen rare mussel species, three rare snail species, and one rare crustacean species. Portions of one stream in the Upper Elk River Watershed are listed in the National Rivers Inventory as having one or more outstanding natural or cultural values.

A review of water quality sampling and assessment is presented in Chapter 3. Using the Watershed Approach to Water Quality, 78 sampling sites were utilized in the Upper Elk River Watershed. These were ambient, ecoregion, watershed monitoring sites or ARAP inspection sites. Monitoring results support the conclusion that 50% of total stream miles (based on RF3) fully support designated uses.



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

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

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

HUC-10 Subwatersheds in the Upper Elk River Watershed.

Point source contributions to the Upper Elk River Watershed consist of nine 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 (129), Tennessee Multi-Sector Permits (41), Mining Permits (11), Water Treatment Plant Permits (2) and Concentrated Animal Feeding Operation Permits (7). 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 Upper Elk River Watershed* and highlights partnerships between agencies and between agencies and landowners that are essential to success. Programs of federal agencies (Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, Tennessee Valley Authority), and state agencies (TDEC Division of Community Assistance, TDEC Division of Water Supply, and Tennessee Department of Agriculture) are summarized. Local initiatives of active watershed organizations (Tims Ford Council) are also described.

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

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

CHAPTER 1

WATERSHED APPROACH TO WATER QUALITY

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

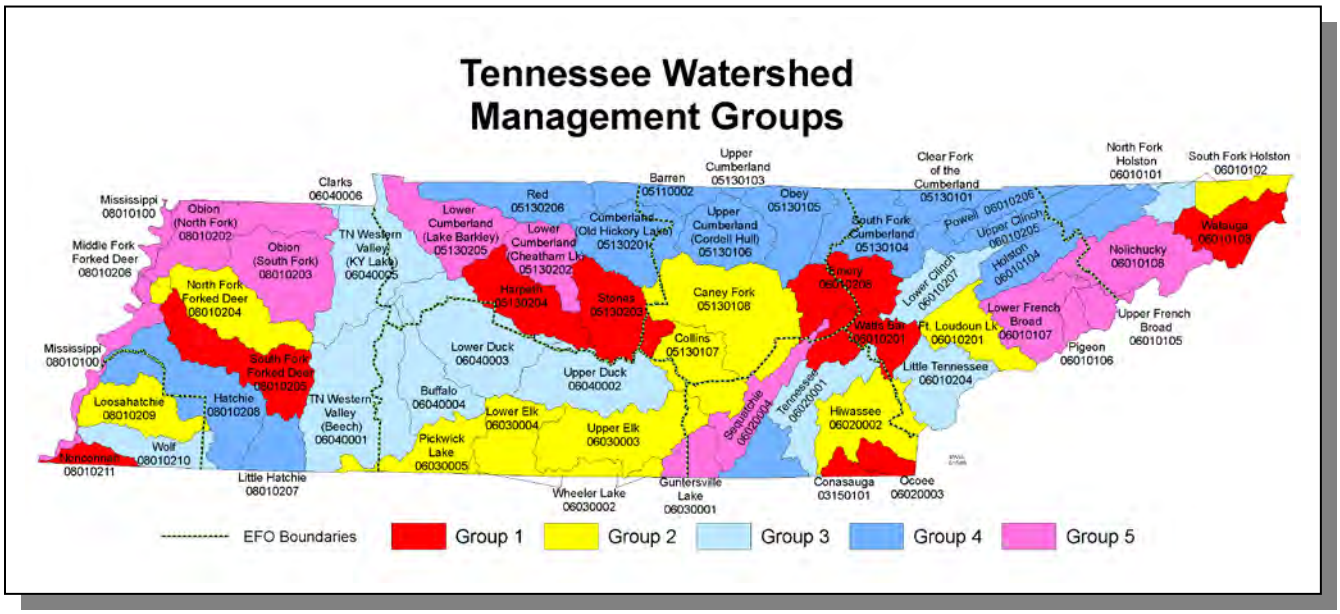


Figure 1-1. Watershed Groups in Tennessee's Watershed Approach to Water Quality.

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

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

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

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

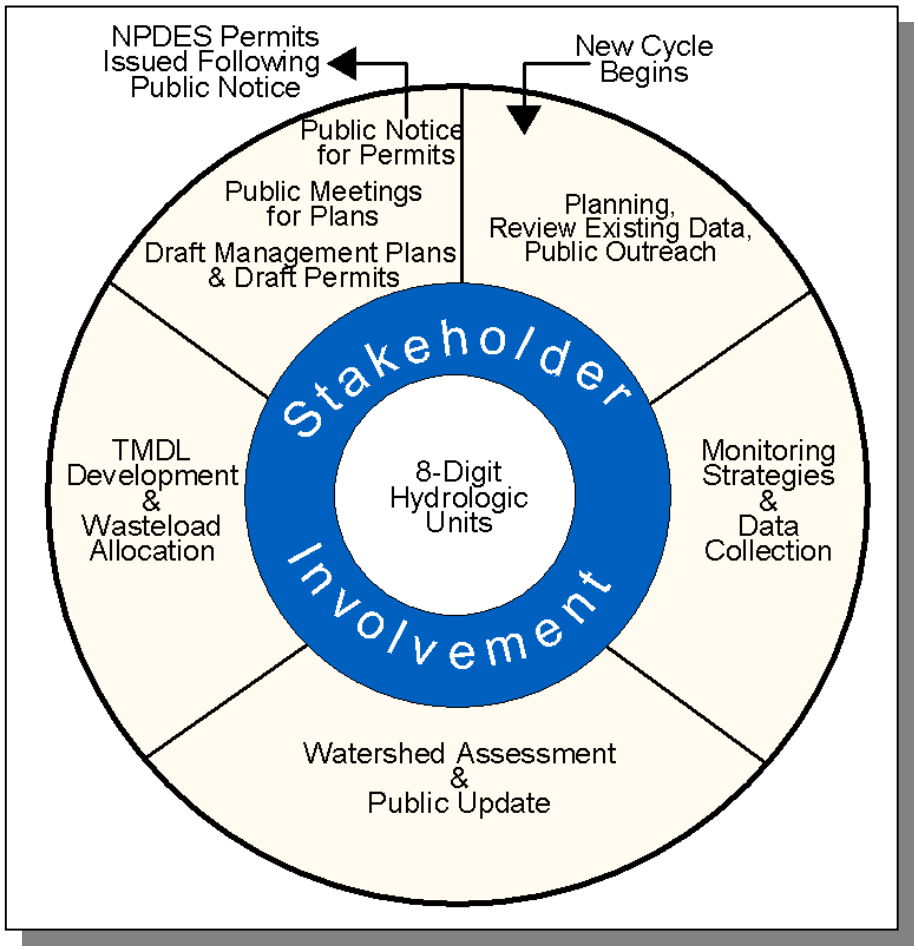


Figure 1-2. The Watershed Approach Cycle.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CHAPTER 2

DESCRIPTION OF THE UPPER ELK RIVER WATERSHED

2.1. BACKGROUND. The Upper Elk River Watershed contains productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The plateau of the watershed receives slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation regions and is characterized by high gradient streams.

Tims Ford and Woods Reservoirs, managed by TVA, are popular boating and fishing areas. The lakes support largemouth and smallmouth bass, while areas below the dams are fished for stocked rainbow trout. The land supports cotton, corn, and soybean production as well as swine and cattle.

This Chapter describes the location and characteristics of the Upper Elk River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Upper Elk River Watershed is located in Middle Tennessee and includes parts of Bedford, Coffee, Franklin, Giles, Grundy, Lincoln, Marshall, and Moore Counties.

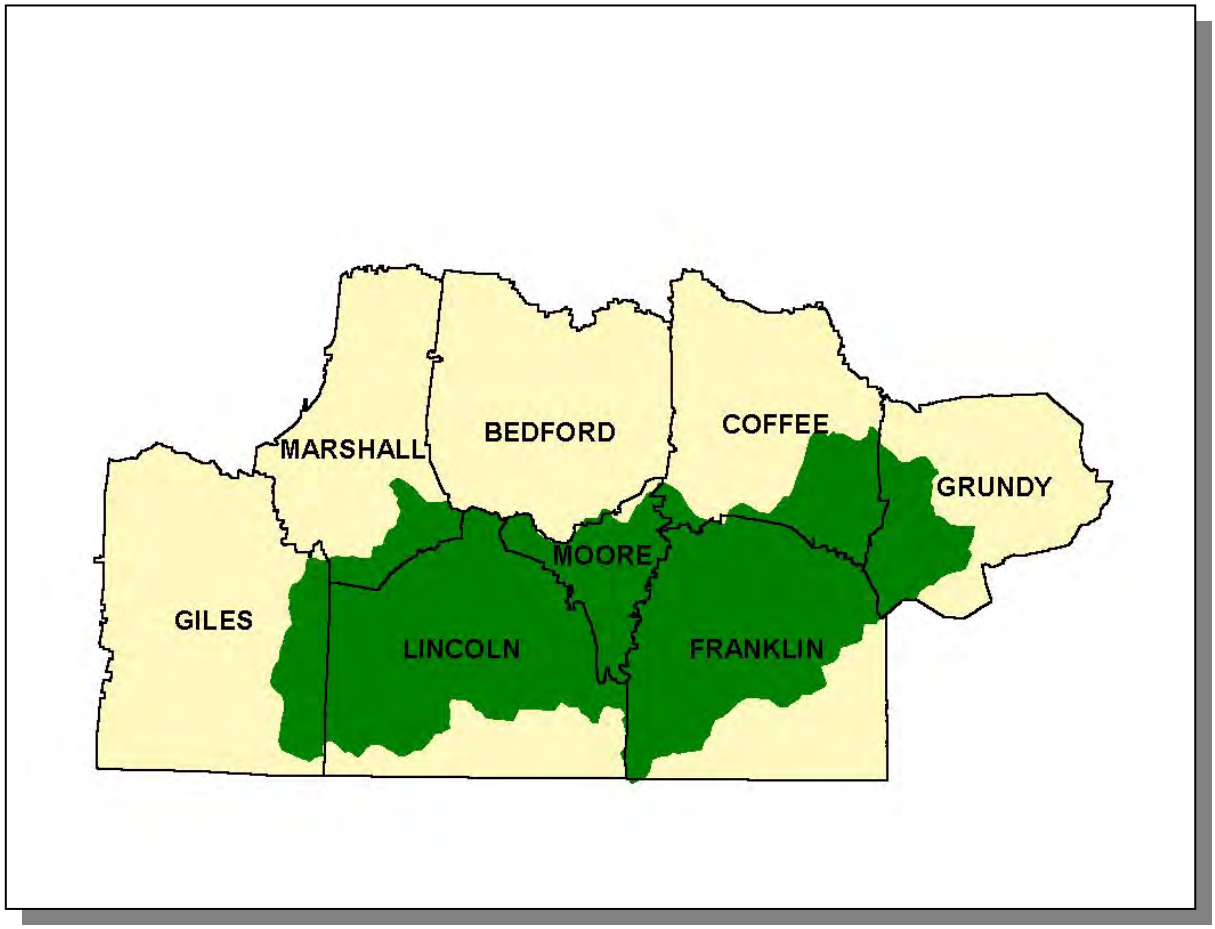


Figure 2-1. General Location of the Upper Elk River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Lincoln	33.4
Franklin	30.1
Moore	9.7
Coffee	8.7
Grundy	7.6
Giles	6.1
Marshall	4.3
Bedford	0.1

Table 2-1. The Upper Elk River Watershed Includes Parts of Eight Middle Tennessee Counties.

2.2.B. Population Density Centers. Six state highways and two interstates serve the major communities in the Upper Elk River Watershed.

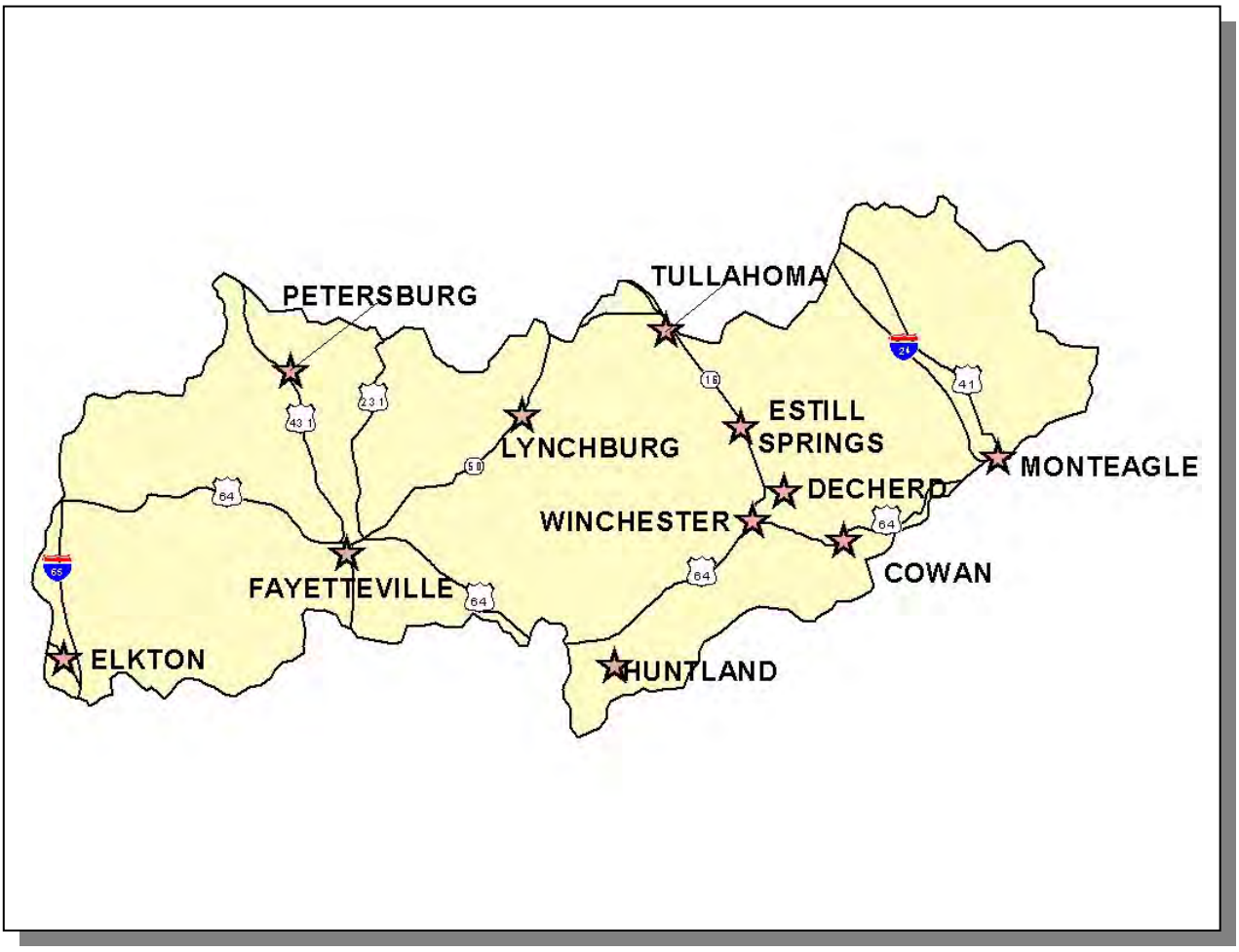


Figure 2-2. Municipalities and Roads in the Upper Elk River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Tullahoma	18,835	Coffee, Franklin
Fayetteville*	7,211	Lincoln
Winchester*	6,515	Franklin
Lynchburg*	5,241	Moore
Decherd	2,326	Franklin
Cowan	1,752	Franklin
Estill Springs	1,466	Franklin
Monteagle	1,029	Marion, Grundy
Huntland	854	Franklin
Petersburg	503	Lincoln, Marshall
Elkton	501	Giles

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

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Upper Elk River Watershed, designated 06030003 by the USGS, drains approximately 1,277 square miles before flowing in to the Lower Elk River Watershed.

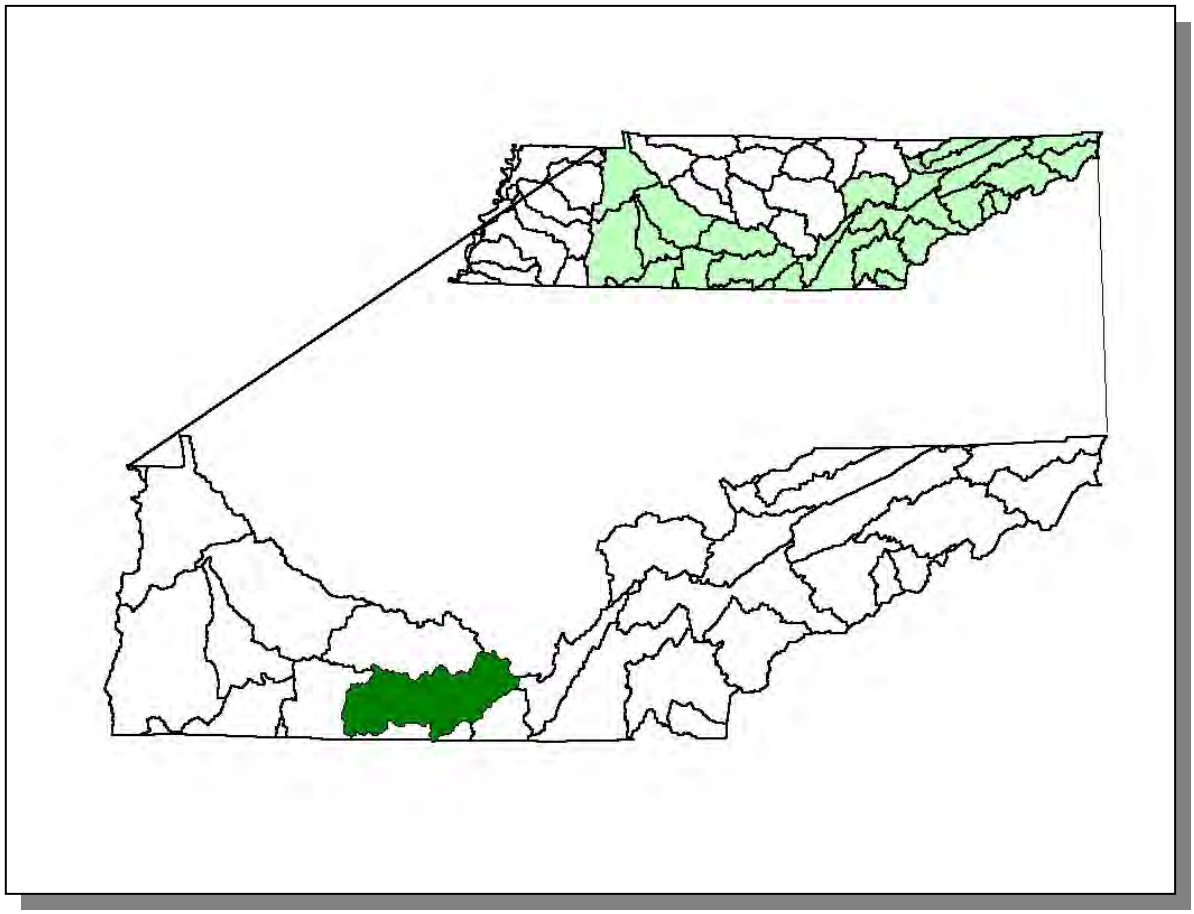


Figure 2-3. The Upper Elk River Watershed is Part of the Tennessee River Basin.

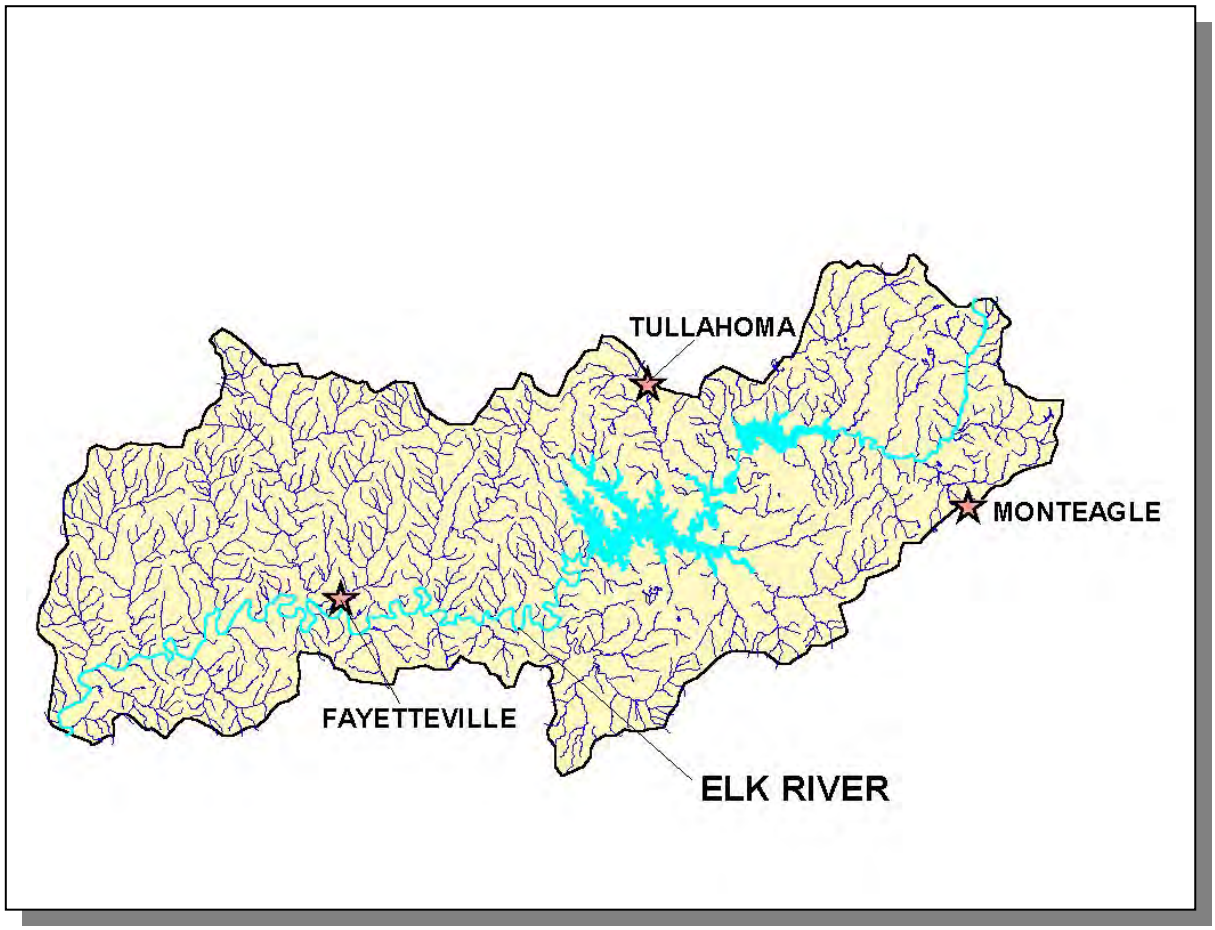


Figure 2-4. Hydrology in the Upper Elk River Watershed. *There are 1,813 total stream miles recorded in River Reach File 3 in the Upper Elk River Watershed. Location of the Elk River, Tims Ford and Woods Reservoirs, and the cities of Fayetteville, Monteagle, and Tullahoma are shown for reference.*

2.3.B. Dams. There are 22 dams inventoried by TDEC Division of Water Supply in the Upper Elk River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

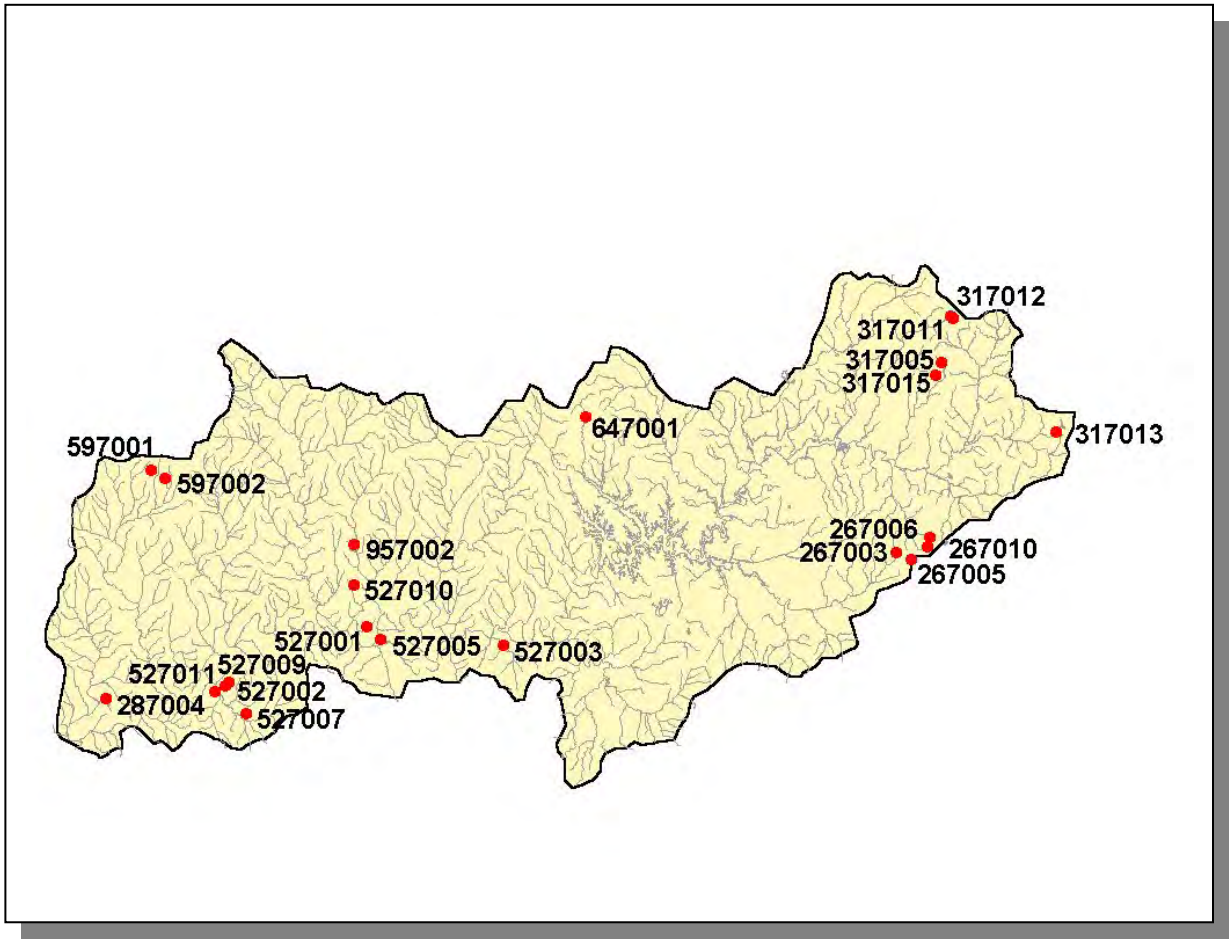


Figure 2-5. Location of Inventoried Dams in the Upper Elk River Watershed. *More information is provided in Upper Elk-Appendix II and on the TDEC homepage at:* *http://gwidc.gwi.memphis.edu/website/dams/viewer.htm*

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

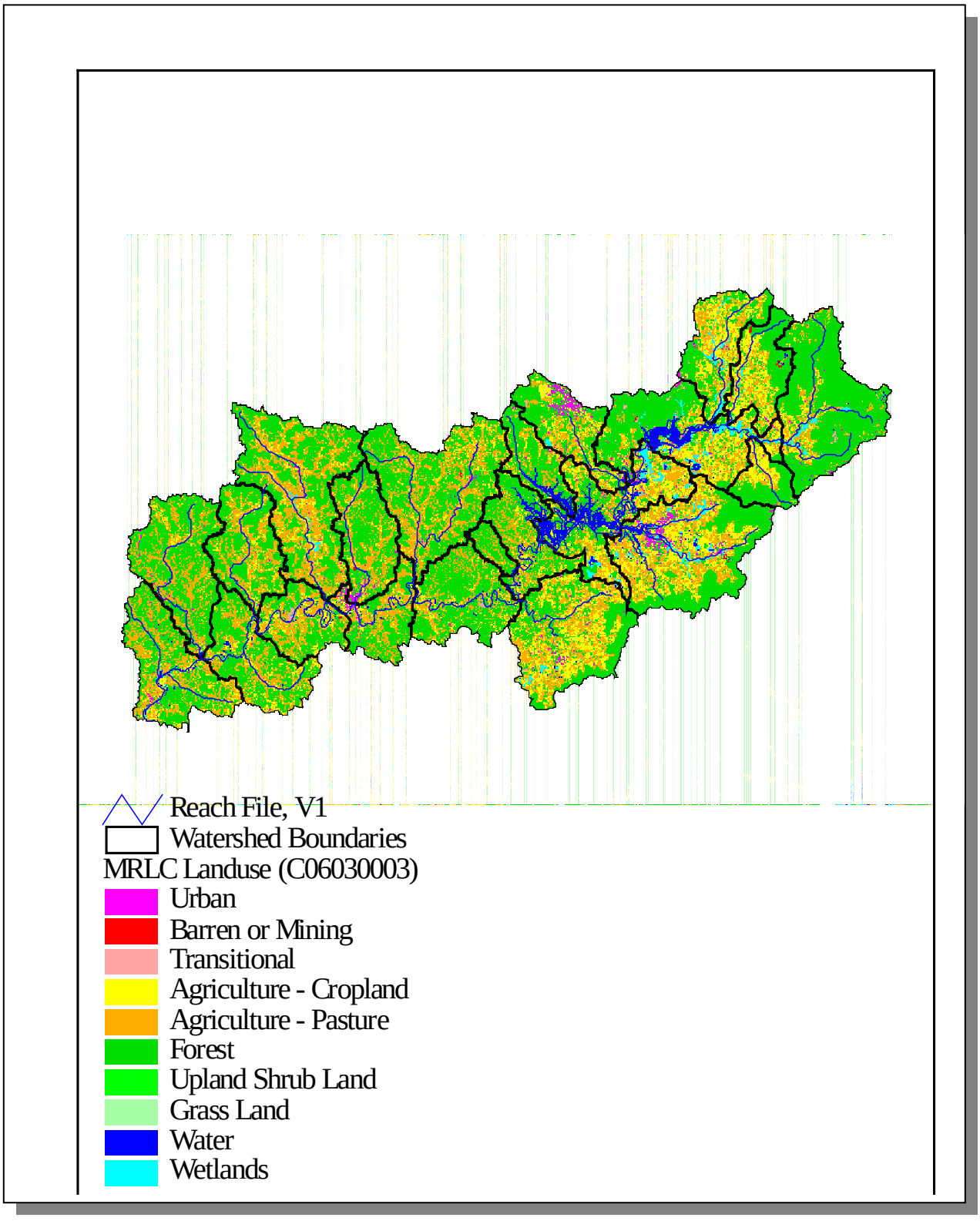


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

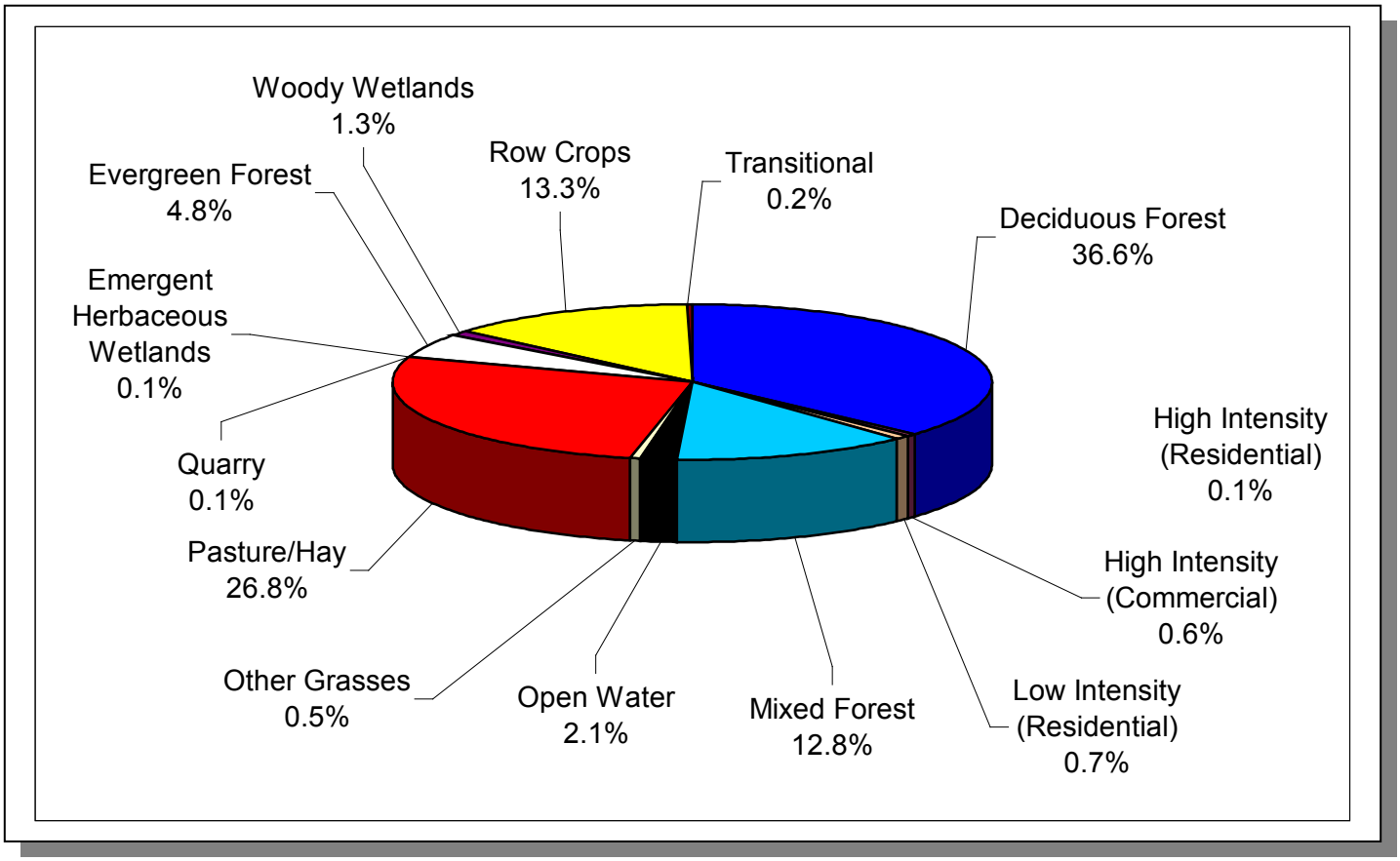


Figure 2-7. Land Use Distribution in the Upper Elk River Watershed. *More information is provided in Upper Elk-Appendix II.*

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 Upper Elk River Watershed lies within 2 Level III ecoregions (Interior Plateau and Southwestern Appalachians) and contains 4 Level IV subecoregions (Griffen, Omernik, Azavedo):

- The Cumberland Plateau's (68a) tablelands and open low mountains are about 1000 feet higher than the ecoregion to the west, and receive slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation ecoregions. The plateau surface is less dissected with lower relief than other ecoregions. Elevations are usually 1200-2000 feet, with the Crab Orchard Mountains reaching over 3000 feet. Pennsylvanian-age conglomerate, sandstone, siltstone, and shale is covered by mostly well-drained, acid soils of low fertility. The region is forested, with some agriculture and coal mining activities.

- The Plateau Escarpment (68c) is characterized by steep, forested slopes and high velocity, high gradient streams. Local relief is often 1000 feet or more. The geologic strata include Mississippian-age limestone, sandstone, shale, and siltstone, and Pennsylvanian-age shale, siltstone, sandstone, and conglomerate. Streams have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Vegetation community types in the ravines and gorges include mixed oak and chestnut oak on the upper slopes, more mesic forests on the middle and lower slopes (beech-tulip poplar, sugar maple-baswood-ash-buckeye), with hemlock along rocky streamsides and river birch along floodplain terraces.

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

- The Outer Nashville Basin (71h) is a heterogeneous region, with rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally no-cherty Mississippian-age

formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forest with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

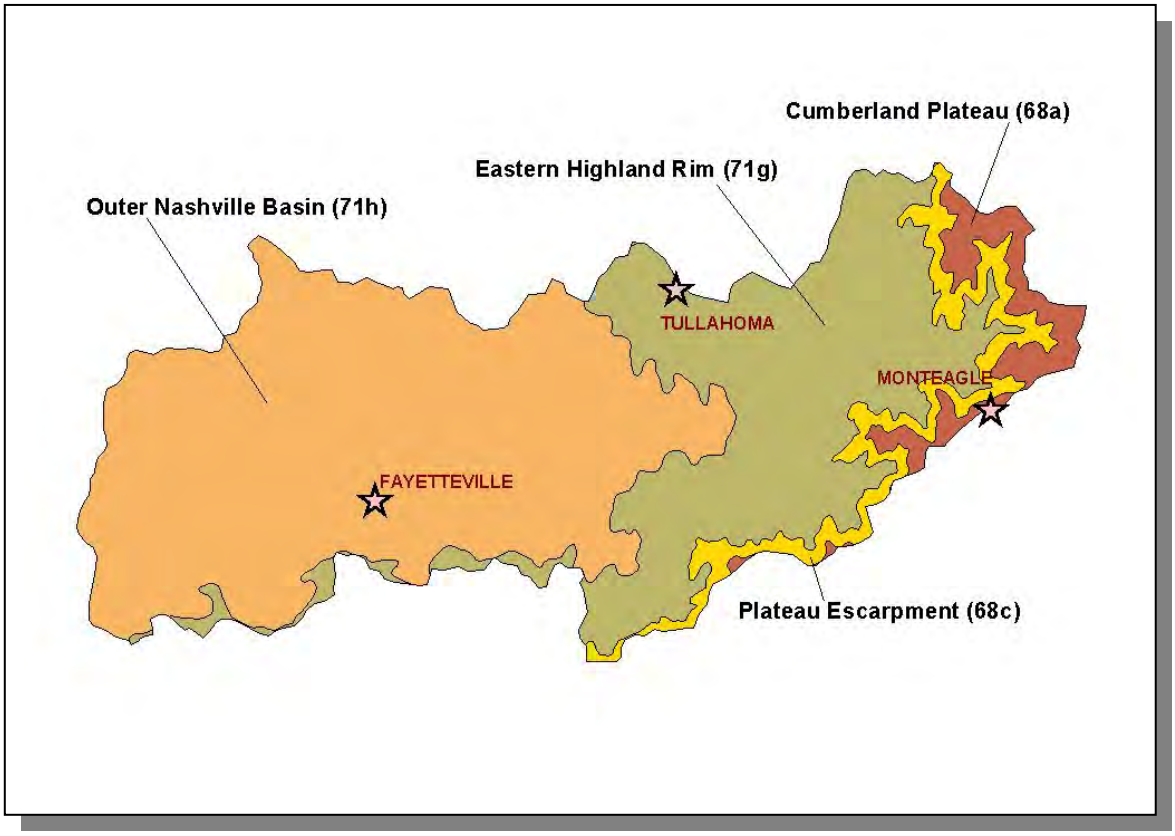


Figure 2-8. Level IV Ecoregions in the Upper Elk River Watershed.

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

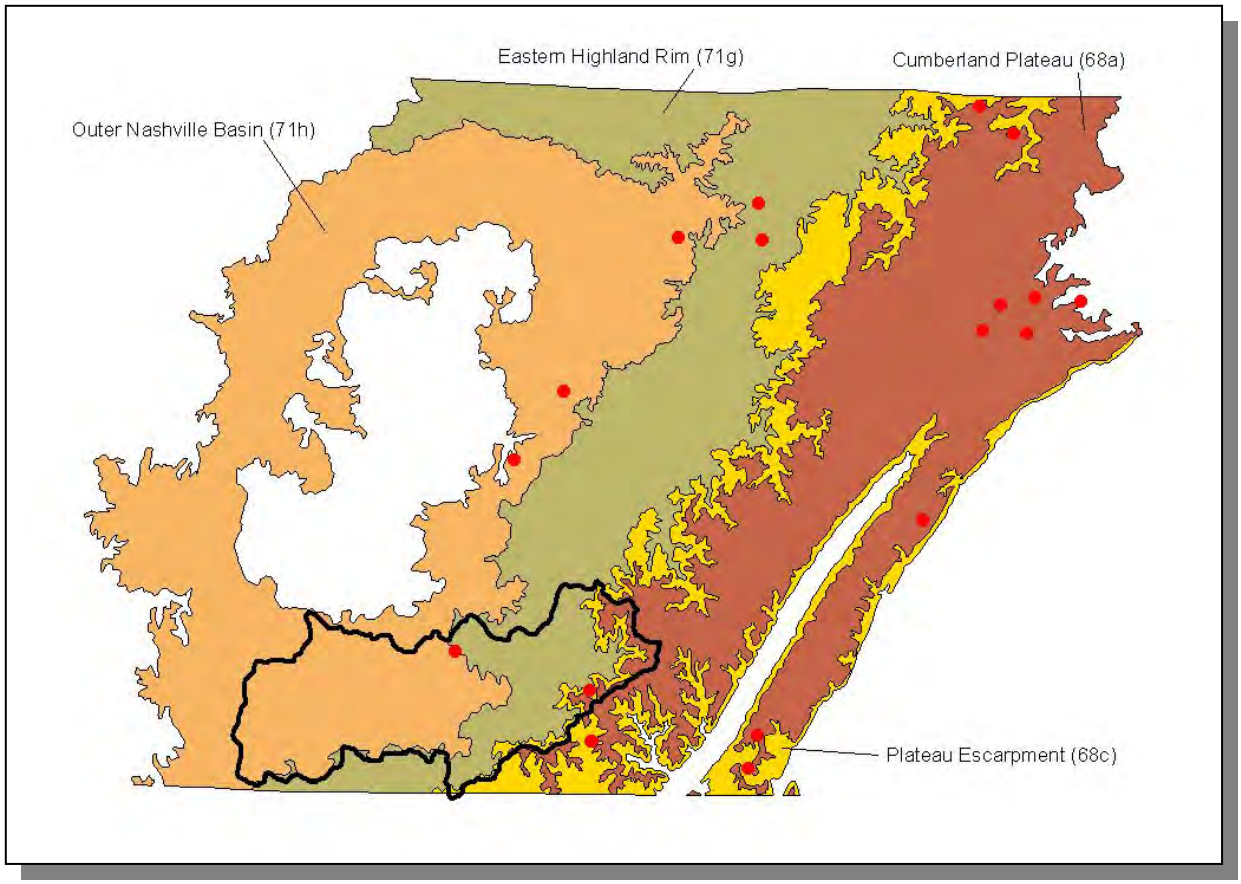


Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 68a, 68c, 71g, and 71h. *The Upper Elk River Watershed is shown for reference. More information is provided in Upper Elk-Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Areas. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. The Upper Elk River Watershed has one Designated State Natural Area:

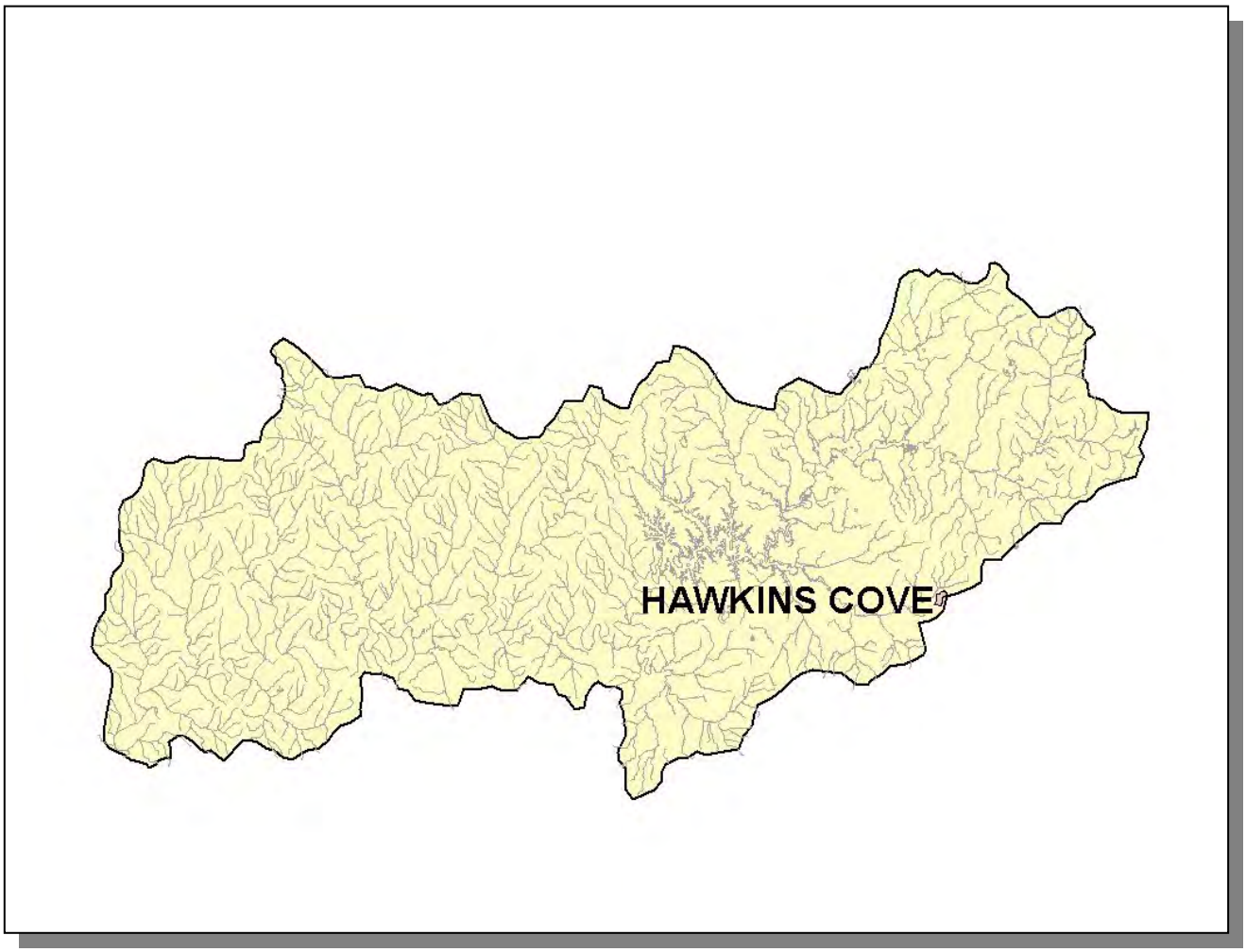


Figure 2-10. Hawkins Cove Designated State Natural Area is in the Upper Elk River Watershed.

2.6.B. 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	1
Mussels	13
Snails	3
Amphibians	1
Birds	6
Fish	4
Mammals	3
Reptiles	0
Plants	55
Total	**87**

Table 2-3. There are 87 Rare Plant and Animal Species in the Upper Elk River Watershed.

In the Upper Elk River Watershed, there are four rare fish species, thirteen rare mussel species, and three rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Carpiodes velifer	Highfin carpsucker		D
Fundulus julisia	Barrens topminnow	MC	E
Etheostoma cinereum	Ashy darter	MC	T
Etheostoma wapiti	Boulder darter	LE	E
Dromus dromas	Dromedary pearlymussel	LE	E
Fusconaia edgariana	Shiny pigtoe	LE	E
Fusconaia cuneolus	Fine-rayed pigtoe	LE	E
Hemistena lata	Cracking pearlymussel	LE	E
Conradilla caelata	Birdwing pearlymussel	LE	E
Obovaria subrotunda	Round hickorynut		
Pegias fabula	Little-wing pearlymussel	LE	E
Pleurobema oviforme	Tennessee clubshell		
Ptychobranchus subtentum	Fluted kidneyshell	C	
Quadrula intermedia	Cumberland monkeyface	LE	E
Toxolasma cylinderellus	Pale lilliput	LE	E
Toxolasma lividum	Purple lilliput		
Villosa fabalis	Rayed bean		
Leptoxis subglovosa umbilicata	Umbilicate rocksnail		
Lithasia geniculata	Ornate rocksnail		
Lithasia lima	Warty rocksnail		

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

2.6.C. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at http://www.state.tn.us/environment/epo/wetlands/strategy.zip.

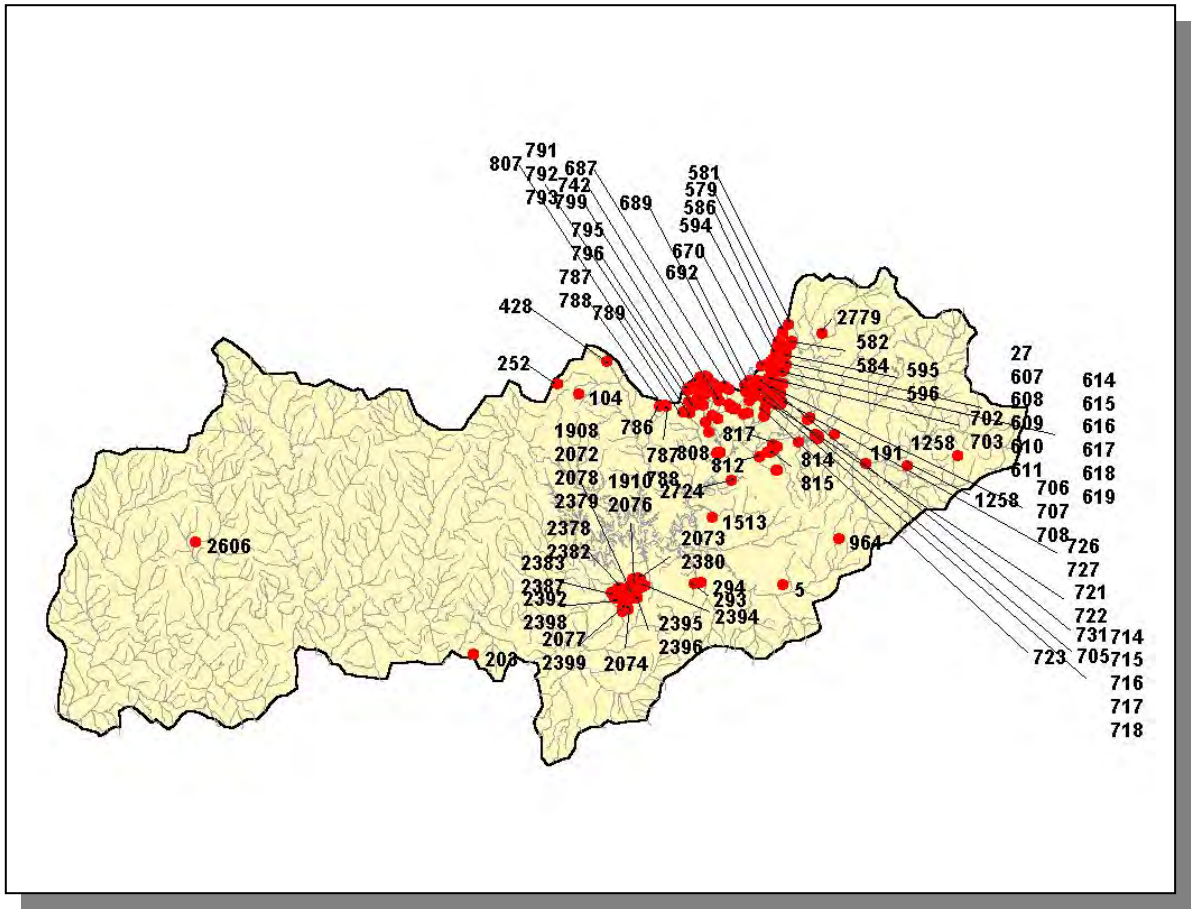


Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Upper Elk River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands in the watershed*. More information is provided in Upper Elk-Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of one stream in the Upper Elk River Watershed:

> Elk River, significant recorded archaeological sites; fine float and game fish stream.

RIVER	SCENIC	RECREATION	FISH	WILDLIFE	HISTORIC	CULTURAL
Elk River	X	X	X	X	X	X

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at http://www.ncrc.nps.gov/rtca/nri/tn.htm

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

- Tims Ford State Park, containing the 10,700 acre Tims Ford Reservoir and 5 miles of paved hiking trails.
- South Cumberland Recreation Area, located in Monteagle, is part of ten different park areas and offers a museum, scenic sites, and hiking trails.

In addition, many local interpretive areas are common, most notably, Elkton City Park and Drycreek Beach in Winchester.

2.7.C. Wildlife Management Area. The Tennessee Wildlife Resources Agency manages one Wildlife Management Area in the Upper Elk Watershed.

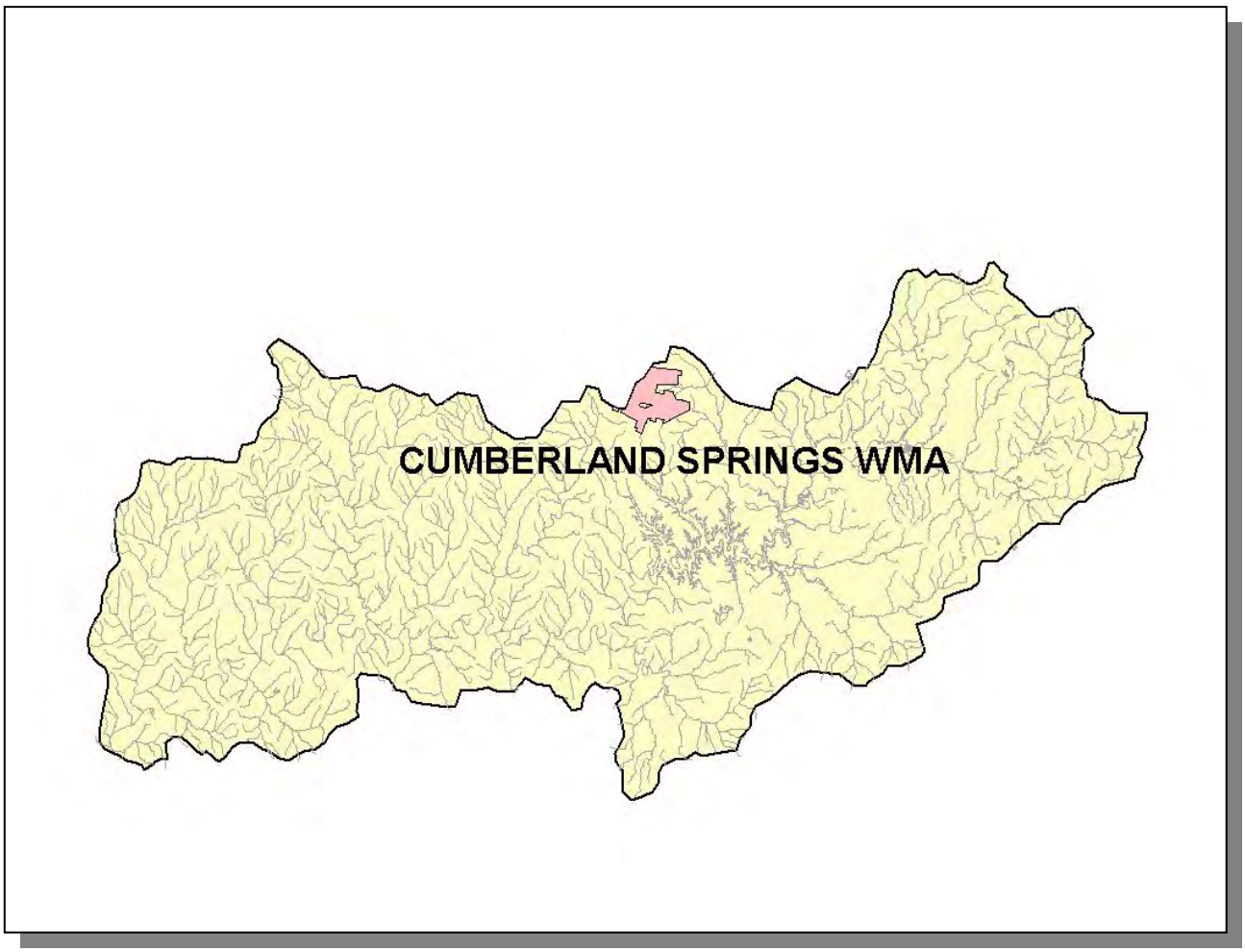


Figure 2-12. TWRA Manages Wildlife Management Areas in the Upper Elk River Watershed.

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
Agency Creek	2		3	Lick Creek			2
Big Lost Creek	1	2	1	North Mouse Creek	3	2	
Bullett Creek	2		3	Oostanaula Creek	3	3	
Candies Creek	2	2		Price Creek	2		
Chatata Creek	2	3	2	Rogers Creek	3	3	
Chestuee Creek	3	3		South Chestuee Creek	2	3	
Childers Creek		1		South Mouse Creek	4	3	
Coker Creek	2		1	Spring Creek (Eastern)	3	3	
Conasauga Creek	3	3	1	Spring Creek (Western)	2		3
Coppinger Creek	4			Sugar Creek	3		
Gunstocker Creek	3	1,2	2	Towee Creek	2		3
Upper Elk River	2,3		1,3	Turtletown Creek			1

Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project.

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

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

CHAPTER 3

WATER QUALITY ASSESSMENT OF THE UPPER ELK RIVER WATERSHED

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

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

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

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

Tennessee uses the 305(b) Report to meet four goals (from 2002 305(b) Report):

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

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

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

4. Highlight areas of improved water quality

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

The 303(d) list is a compilation of the waters of Tennessee that are water quality limited and fail to support some or all of their classified uses. Water quality limited streams are those that have one or more properties that violate water quality standards. Therefore, the water body is considered to be impacted by pollution and is not fully meeting its designated uses. The 303(d) list does not include streams determined to be fully supporting designated uses as well as streams the Division of Water Pollution Control cannot assess due to lack of water quality information. Also absent are streams where a control strategy is already in the process of being implemented.

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

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

The current 303(d) List is available on the TDEC homepage at:
http://www.state.tn.us/environment/wpc/publications/2002303dpropfinal.pdf

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

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

3.2. DATA COLLECTION. Comprehensive water quality monitoring in the Upper Elk River Watershed was conducted in 1997 and 1998. Data were collected from 82 sites and are from one of four types of sites: 1)Ambient sites, 2)Ecoregion sites, 3)Watershed sites or 4)Aquatic Resources Alteration Permit (ARAP) inspection sites.

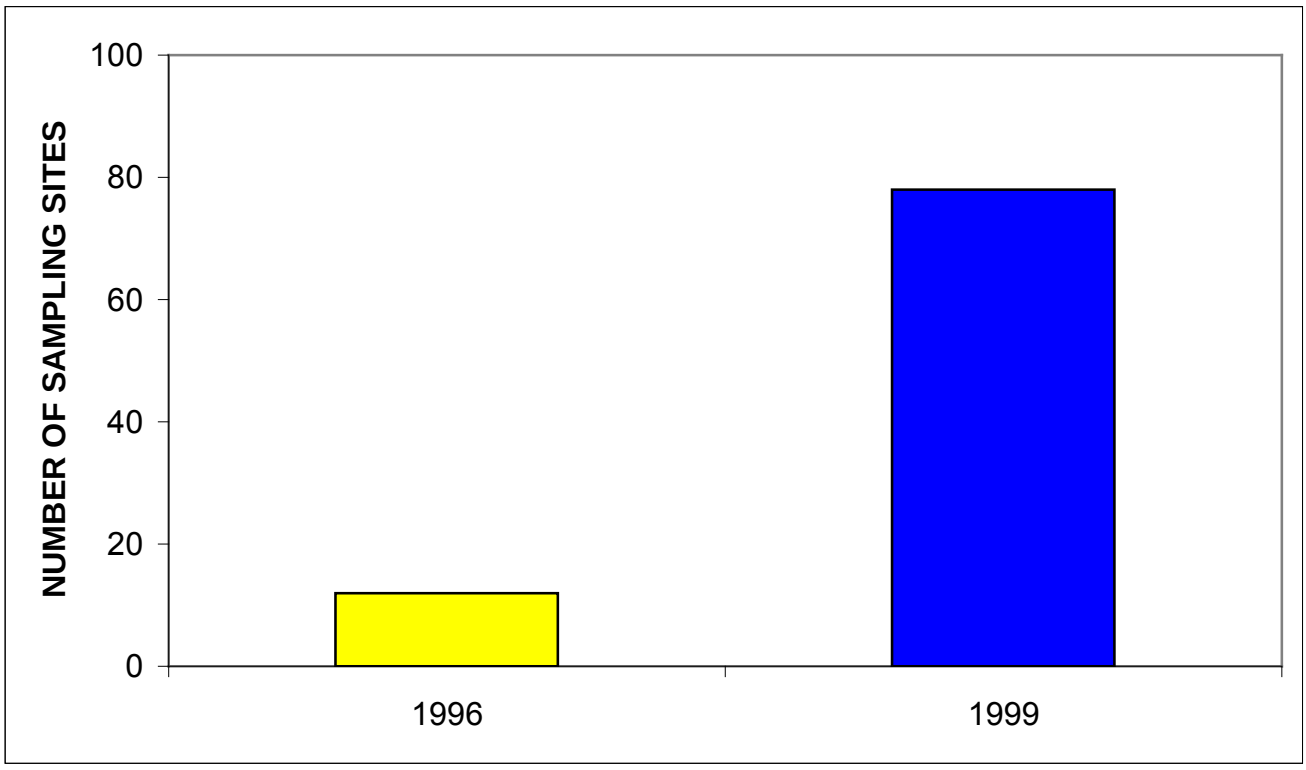


Figure 3-1. Number of Sampling Sites Using the Traditional Approach (1996) and Watershed Approach (1999) in the Upper Elk River Watershed.

Figure 3-2. Location of Monitoring Sites in the Upper Elk River Watershed. *Red, Watershed Monitoring Sites; Black, Observational Data Sites; Orange, Rapid Bioassessment Sites; Green, Ambient Monitoring Sites. Locations of Fayetteville, Monteagle, and Tullahoma are shown for reference.*

TYPE	NUMBER	TOTAL NUMBER OF SAMPLING EVENTS		
		CHEMICAL ONLY	BIOLOGICAL ONLY	BIOLOGICAL PLUS CHEMICAL (FIELD PARAMETERS)
Ambient	9	24		
Ecoregion	1	3		3
Watershed	67		67	
ARAP Site Inspections	1		1	
Totals	**78**	**27**	**68**	**3**

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

In addition to the sampling events, 60 citizen complaints were investigated.

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

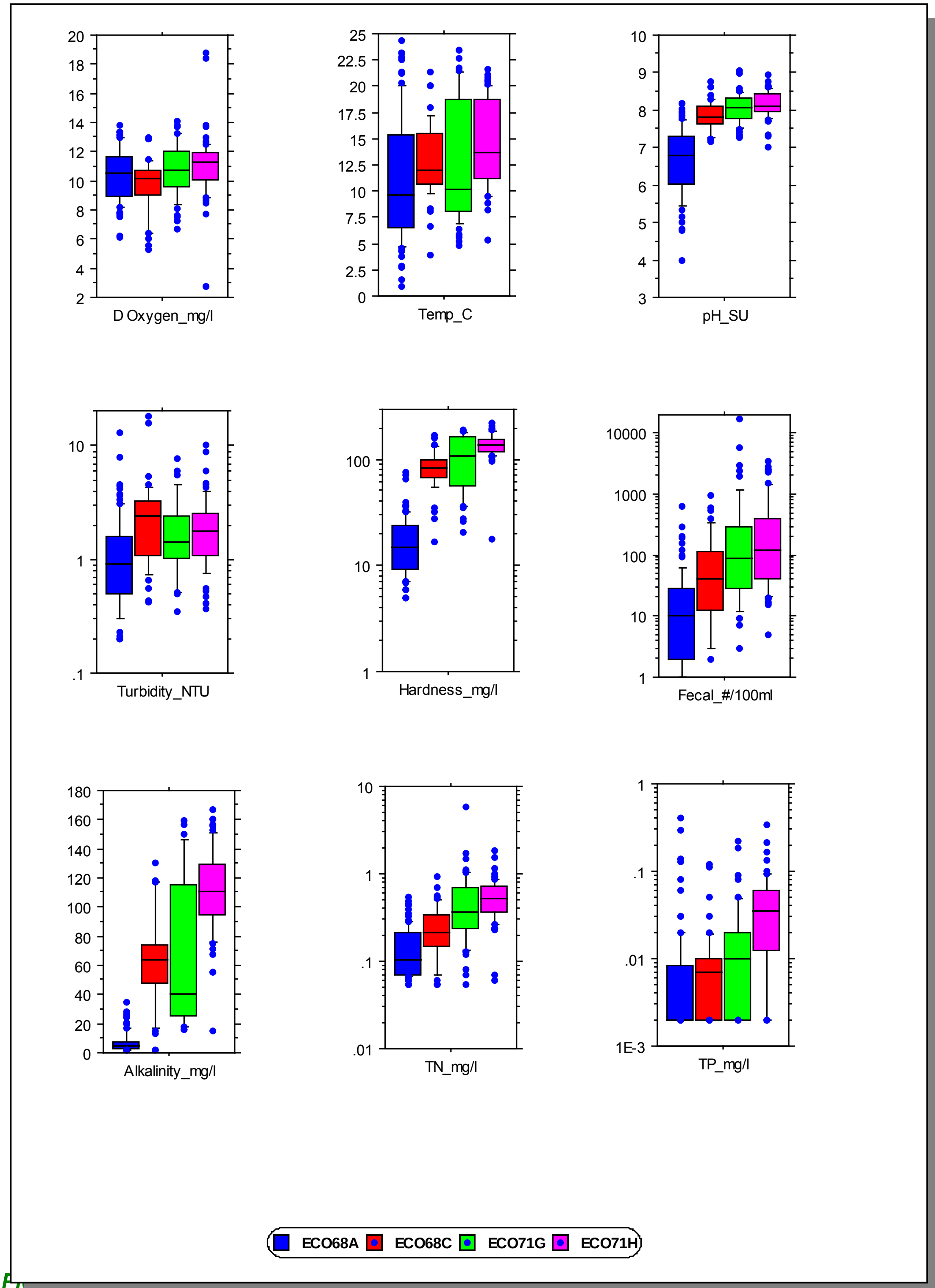
Data from ambient monitoring stations are entered into the STORET (Storage and Retrieval) system administered by EPA. Some ambient monitoring stations are scheduled to be monitored as watershed sampling sites.

3.2.B. Ecoregion Sites. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plants and animals. The delineation phase of the Tennessee Ecoregion Project was completed in 1997 when the ecoregions and subecoregions were mapped and summarized (EPA/600/R-97/022). There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee (see Chapter 2 for more details). The Upper Elk River Watershed lies within 2 Level III ecoregions (Interior Plateau and Southwestern Appalachians) and contains 4 subecoregions (Level IV):

- Cumberland Plateau (68a)
- Plateau Escarpment (68c)
- Eastern Highland Rim (71g)
- Outer Nashville Basin (71h)

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

Ecoregion stations are scheduled to be monitored as Watershed sampling sites.



F... tes. 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.

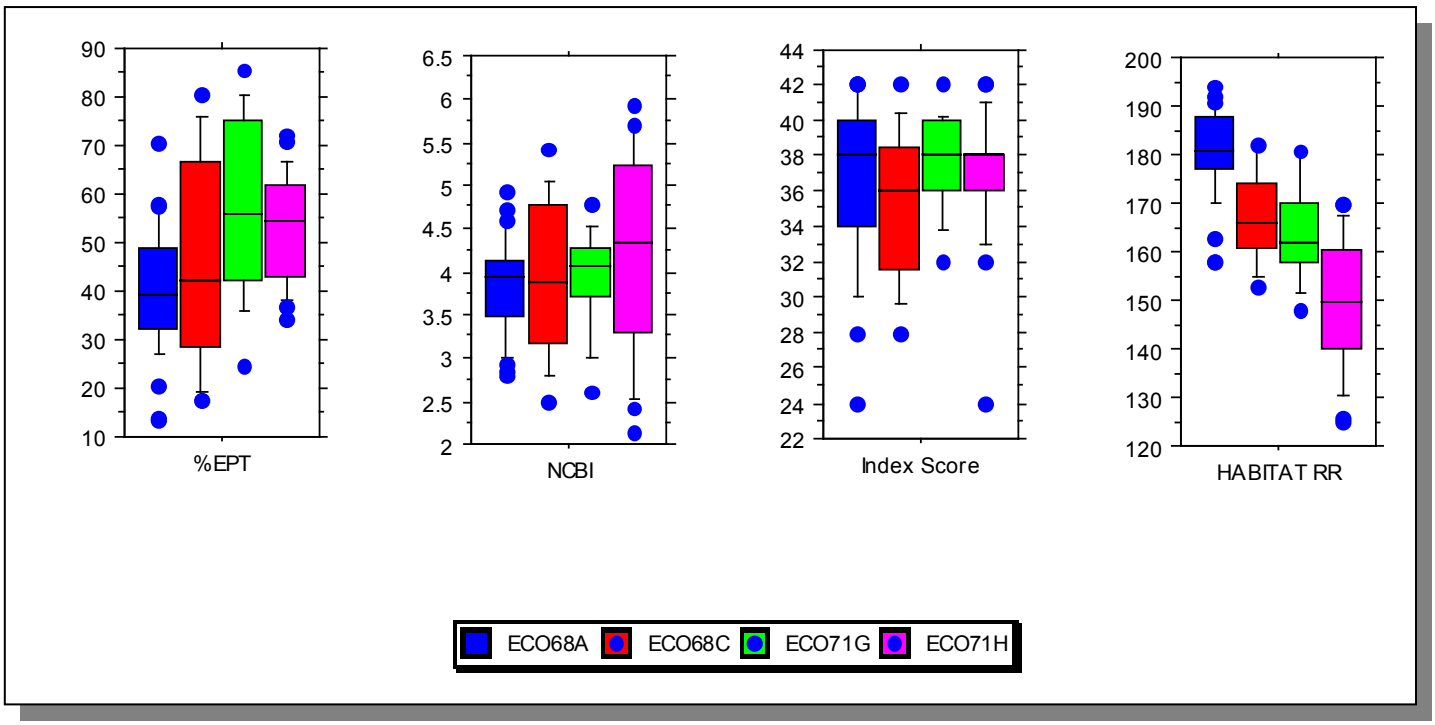


Figure 3-4. Benthic Macroinvertebrate and Habitat Scores for Upper Elk River Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th, median, 75th, and 90th percentiles. Extreme values are also shown as dots. NCBI, North Carolina Biotic Index. Index Score and Habitat Riffle/Run scoring system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

3.2.C. Watershed Screening Sites. Activities that take place at watershed sites are benthic macroinvertebrate stream surveys, physical habitat determinations and/or

chemical monitoring. Following review of existing data, watershed sites are selected in Year 1 of the watershed approach when preliminary monitoring strategies are developed. Additional sites may be added in Year 2 when additional monitoring strategies are implemented.

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

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

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

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

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

3.3. STATUS OF WATER QUALITY. Overall use support is a general description of water quality conditions in a water body based on determination of individual use supports. Use support determinations, which can be classified as monitored or evaluated, are based on:

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

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

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

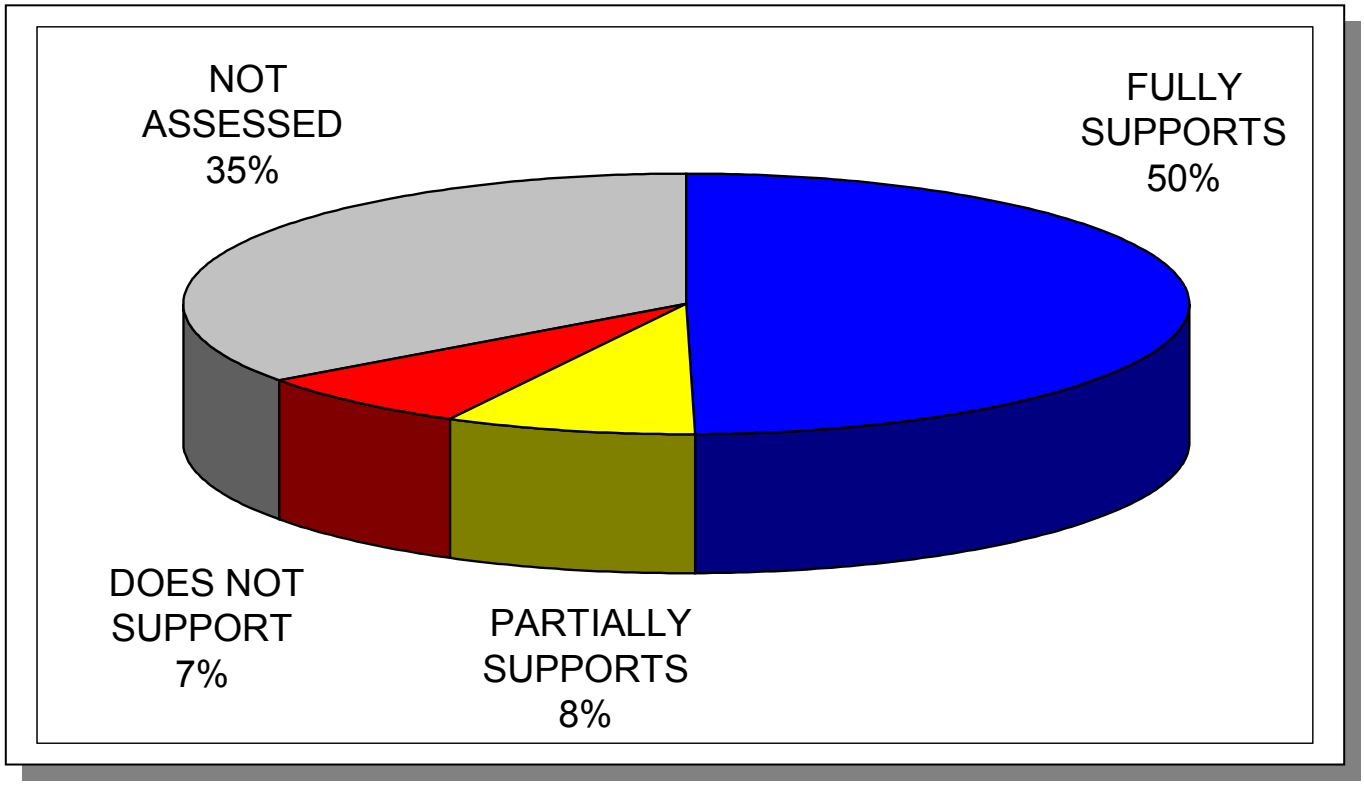


Figure 3-5a. Water Quality Assessment for Streams and Rivers in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment.*

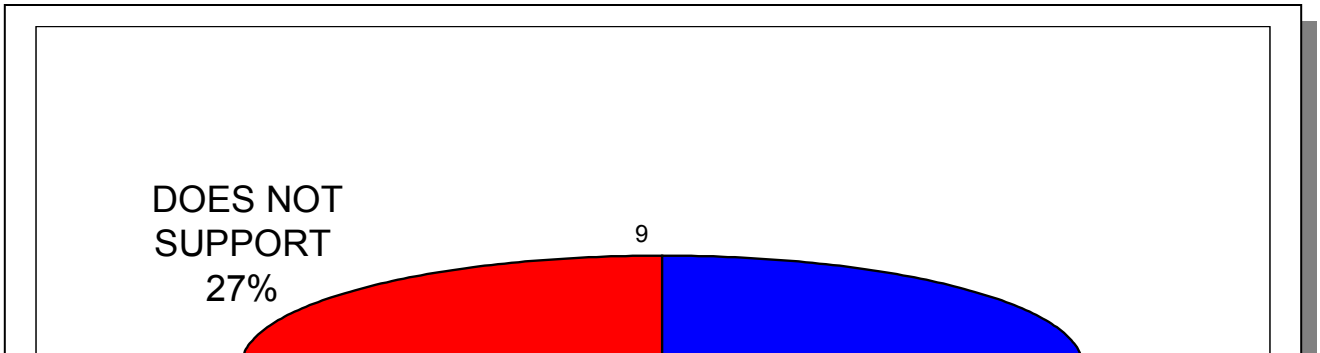


Figure 3-5b. Water Quality Assessment for Lakes in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. More information is provided in Upper Elk-Appendix III.*

3.3.A. Assessment Summary.

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

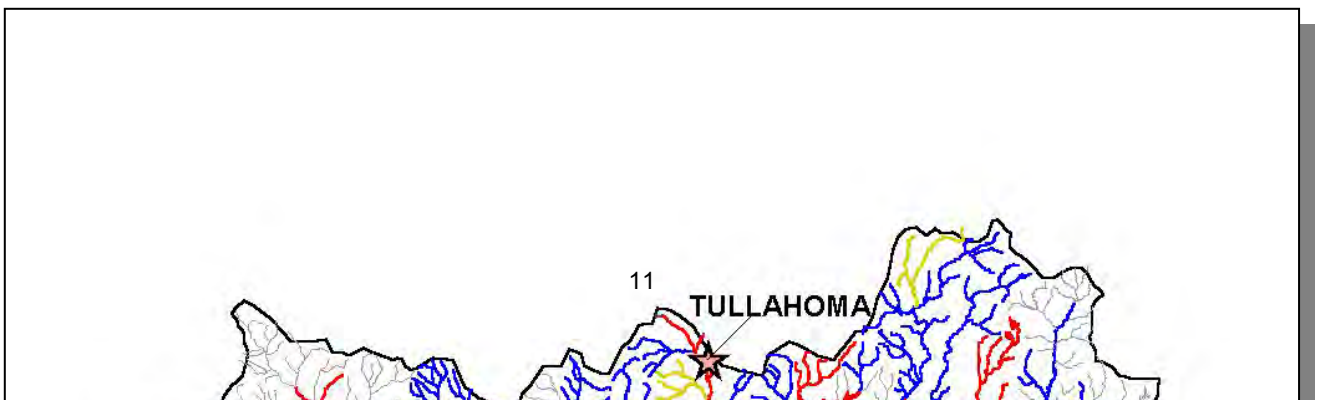


Figure 3-6b. Fish and Aquatic Life Use Support Attainment in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Gray, Not Assessed. Water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

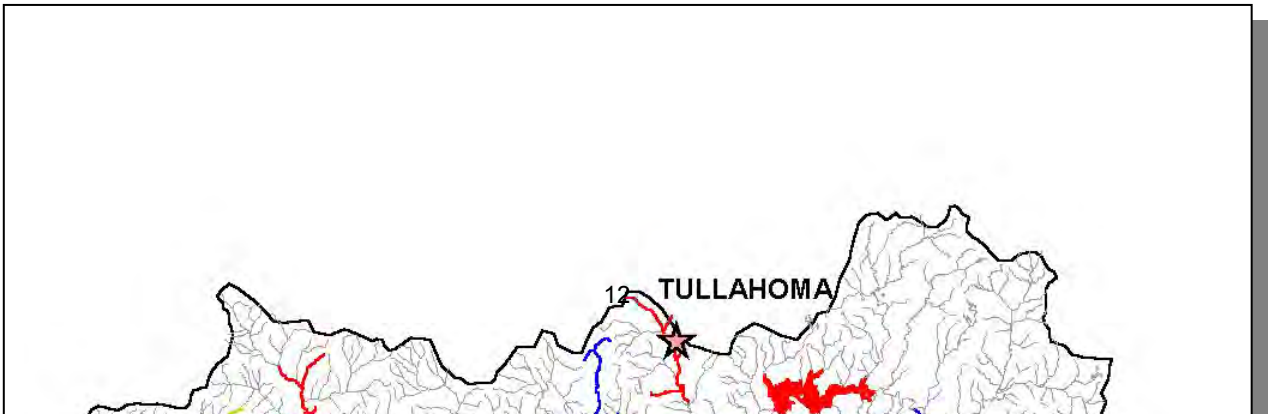


Figure 3-6c. Recreation Use Support Attainment in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Yellow, Partially Supports Designated Use; Red, does not support Designated Use; Gray, Not Assessed. Water Quality Standards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

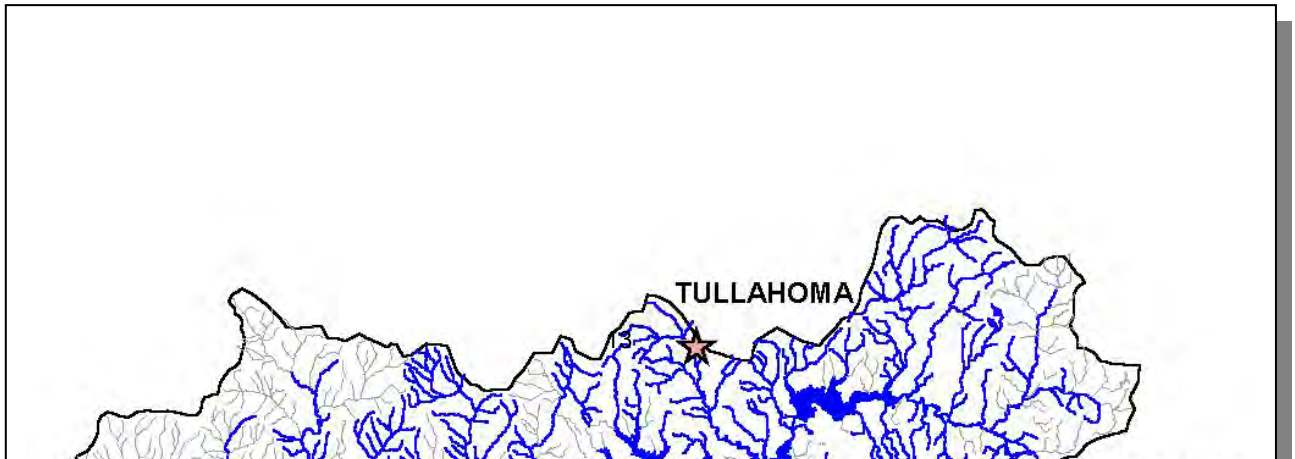


Figure 3-6d. Irrigation Use Support Attainment in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Gray, Not Assessed. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm.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

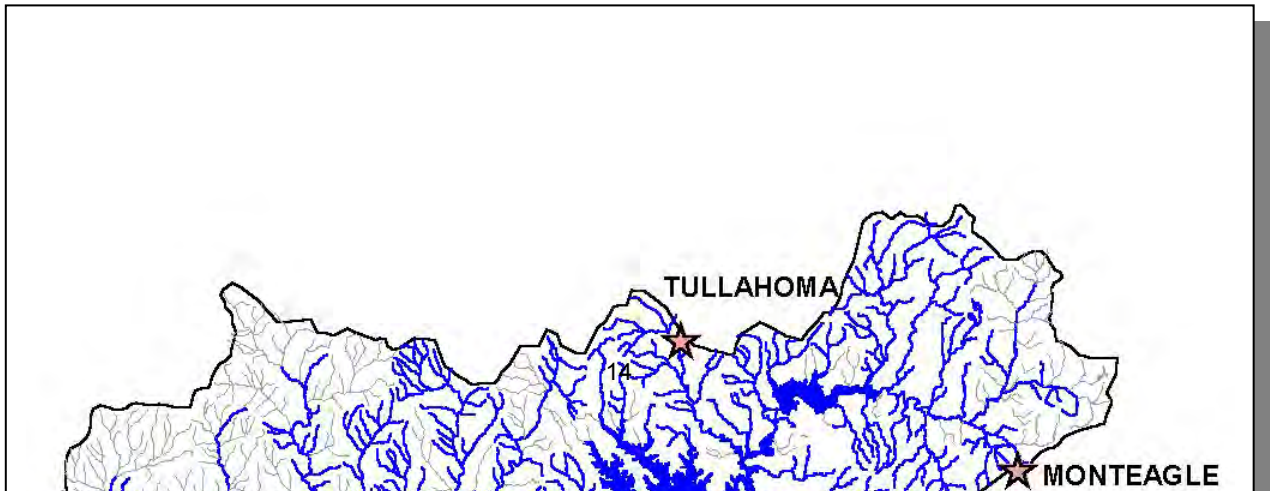


Figure 3-6e. Livestock Watering and Wildlife Use Support Attainment in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Blue, Fully Supports Designated Use; Gray, Not Assessed. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm.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

3.3.B. Use Impairment Summary.

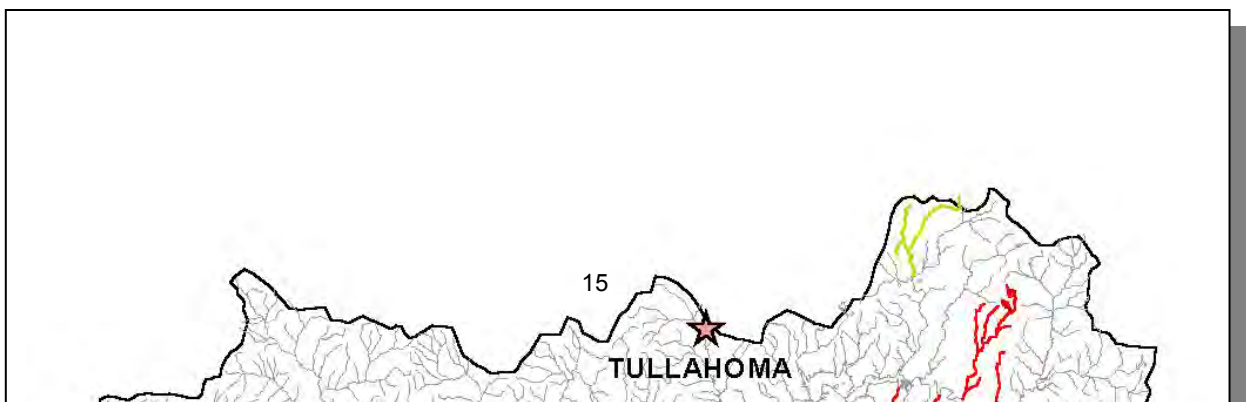


Figure 3-7a. Impaired Streams Due to Habitat Alteration in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment.; Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Fayetteville, Monteagle, and Tullahoma are shown for reference.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

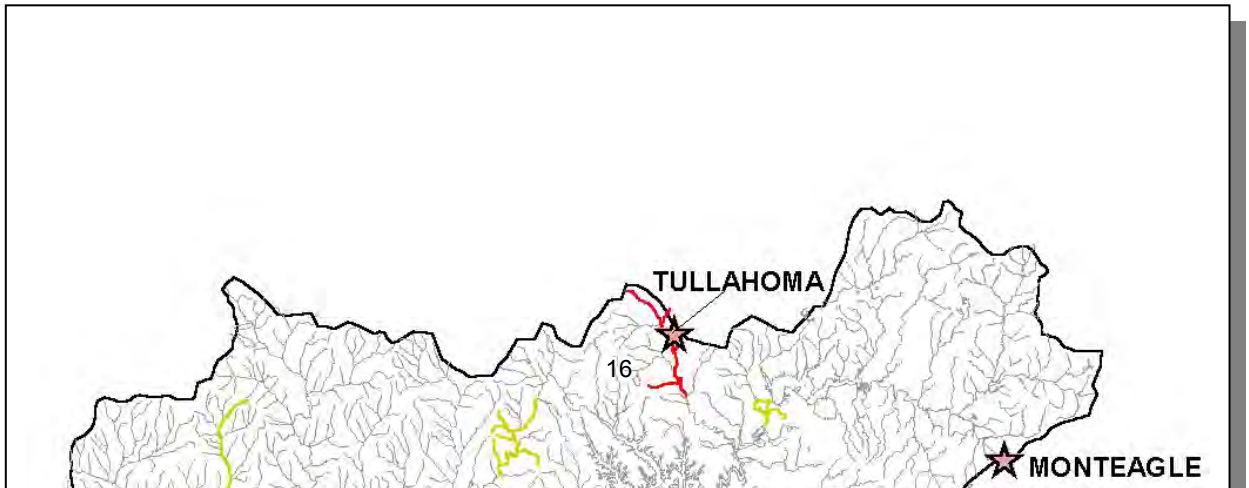


Figure 3-7b. Impaired Streams Due to Organic Enrichment/Low Dissolved Oxygen Levels in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Yellow, Partially Supports designated Use; Red, Does Not Support Designated Use; Fayetteville, Monteagle, and Tullahoma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

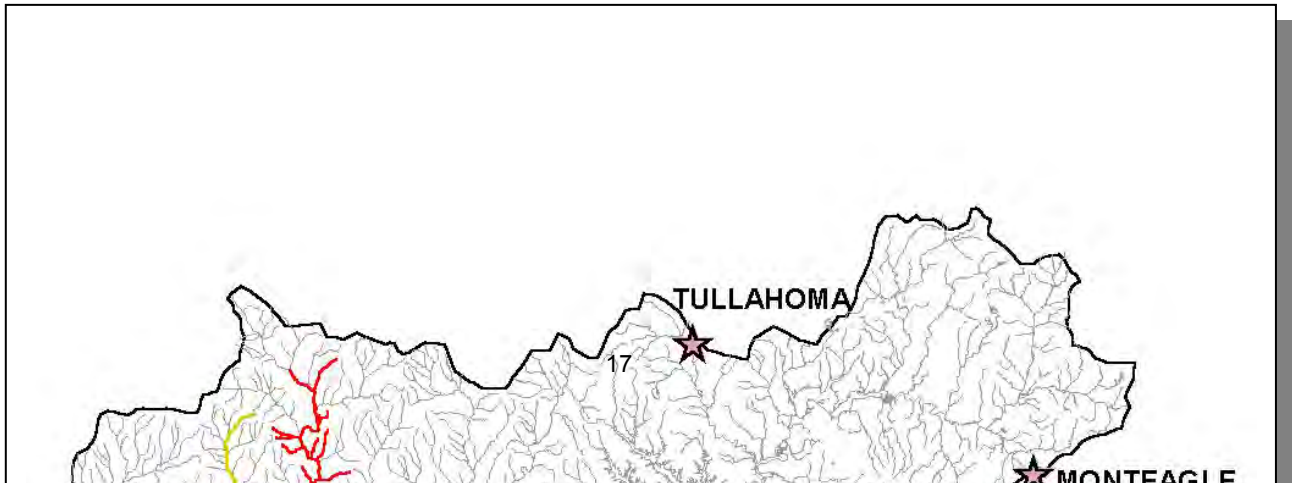


Figure 3-7c. Impaired Streams Due to Pathogens in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Fayetteville, Monteagle, and Tullahoma are shown for reference. More information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

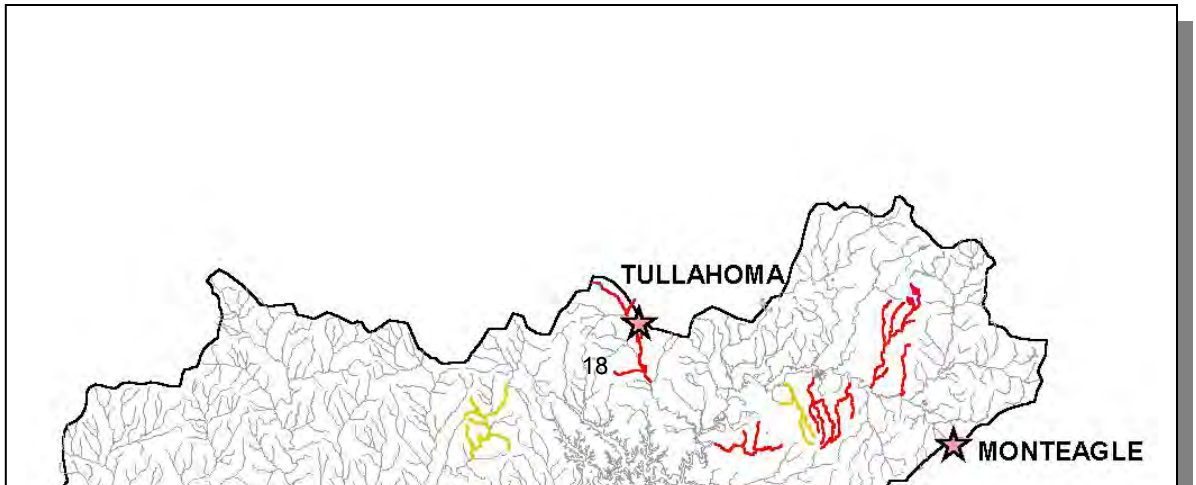


Figure 3-7d. Impaired Streams Due to Siltation in the Upper Elk River Watershed. *Assessment data are based on the 2000 Water Quality Assessment. Yellow, Partially Supports Designated Use; Red, Does Not Support Designated Use; Fayetteville, Monteagle, and Tullahoma are shown for reference. More information is provided in Upper Elk-Appendix III.*

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

In the year 2002 and beyond, the 303(d) list will be compiled by using EPA's ADB (Assessment Database) software developed by RTI (Research Triangle Institute). The ADB allows for a more detailed segmentation of waterbodies. While this results in a more accurate description of the status of water quality, it makes it difficult when comparing water quality assessments with and without using this tool. A more meaningful comparison will be between assessments conducted in Year 3 of each succeeding five-year cycle.

The ADB was used to create maps that illustrate water quality. These maps may be viewed on TDEC's homepage at http://www.state.tn.us/environment/water.htm, Summary maps of each watershed may be viewed at http://www.state.tn.us/environment/wpc/watershed/mapsummary.htm.

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

A fluvial geomorphic curve illustrates relationships between drainage area, bankful dimensions of width, depth and cross-sectional area, and bankful discharge of stream

systems that are in dynamic equilibrium. It is a tool to evaluate and predict the physical impacts of channel modifications, flow alterations, and other watershed changes, as well as determining appropriate physical parameters for stream and riparian restoration. Regional curves have been developed and applied in various regions of the country since the mid-1970's (Dunne and Leopold, 1978).

There are several benefits to using regional curves:

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

Ultimately, a regional curve will be created that illustrates the relationship between bankful width and drainage area.

CHAPTER 4

POINT AND NONPOINT SOURCE CHARACTERIZATION OF THE UPPER ELK RIVER WATERSHED

4.1. BACKGROUND. This chapter is organized by HUC-10 subwatershed, and the description of each subwatershed is divided into four parts:

i. General description of the subwatershed
ii. Description of point source contributions
ii.a. Description of facilities discharging to water bodies listed on the 1998 303(d) list
iii. Description of nonpoint source contributions

The Upper Elk River Watershed (HUC 06030003) has been delineated into nine HUC 10-digit subwatersheds.

Information for this chapter was obtained from databases maintained by the Division of Water Pollution Control or provided in the WCS (Watershed Characterization System) data set. The WCS used was version 1.1 beta (developed by Tetra Tech, Inc for EPA Region 4) released in 2000.

WCS integrates with ArcView® v3.2 and Spatial Analyst® v1.1 to analyze user-delineated (sub)watersheds based on hydrologically connected water bodies. Reports are generated by integrating WCS with Microsoft® Word. Land Use/Land Cover information from 1992 MRLC (Multi-Resolution Land Cover) data are calculated based on the proportion of county-based land use/land cover in user-delineated (sub)watersheds. Nonpoint source data in WCS are based on agricultural census data collected 1992–1998; nonpoint source data were reviewed by Tennessee NRCS staff.

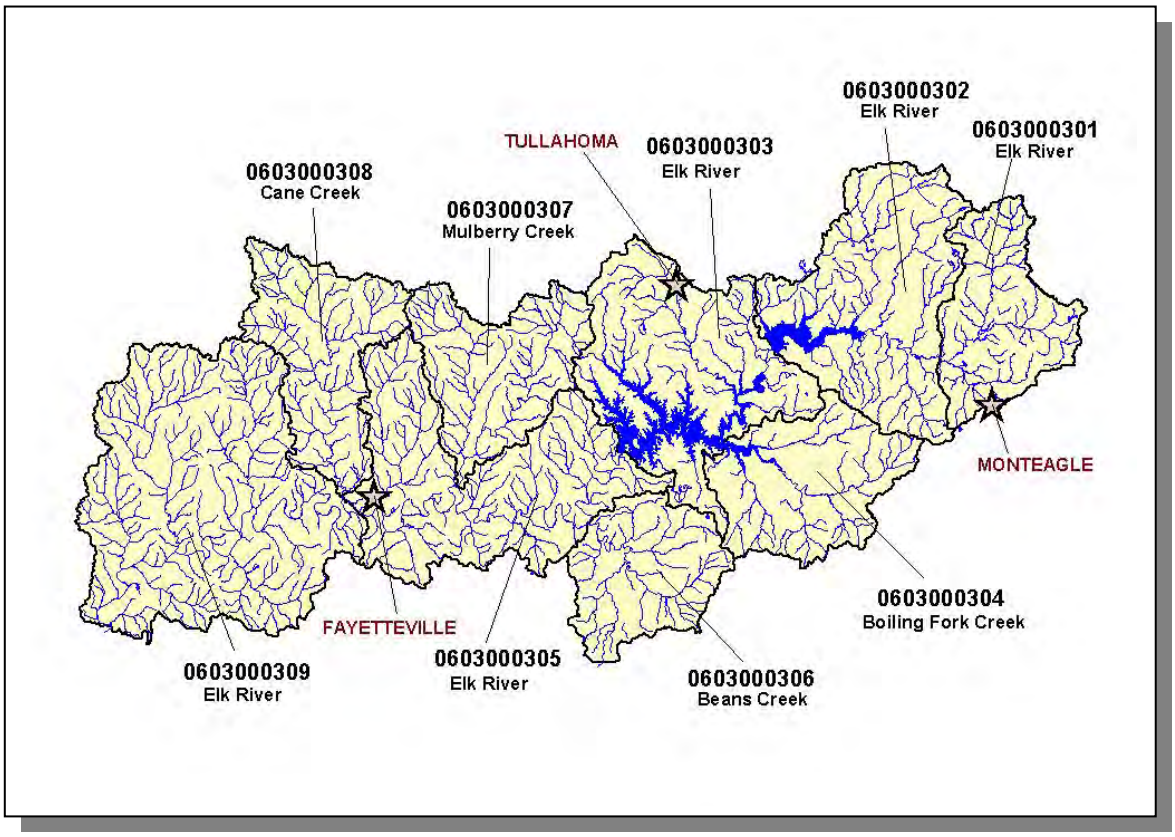


Figure 4-1. The Upper Elk River Watershed is Composed of Nine USGS-Delineated Subwatersheds (10-Digit Subwatersheds). *Locations of Fayetteville, Monteagle, and Tullahoma are shown for reference.*

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 Hiwassee River Watershed.

HUC-10	HUC-12
0603000301	060300030101 (Elk River)
	060300030102 (Dry Creek)
	060300030103 (Elk River)
0603000302	060300030201 (Woods Reservoir)
	060300030202 (Betsy Willis Creek)
	060300030203 (Mud Creek)
	060300030204 (Beans Creek)
	060300030205 (Bradley Creek)
0603000303	060300030301 (Tims Ford Reservoir)
	060300030302 (Spring Creek)
	060300030303 (Hessey Branch)
	060300030304 (Taylor Creek)
	060300030305 (Rock Creek)
	060300030306 (Little Hurricane Creek)
	060300030307 (Owl Hollow Creek)
	060300030308 (Hurricane Creek)
0603000304	060300030401 (Boiling Fork Creek)
	060300030402 (Norwood Creek)
	060300030403 (Dry Creek)
0603000305	060300030501 (Elk River)
	060300030502 (Murrell Creek)
	060300030503 (Farris Creek)
	060300030504 (Elk River)
	060300030505 (Elk River)
	060300030506 (Norris Creek)
0603000306	060300030601 (Upper Beans Creek)
	060300030602 (Lower Beans Creek)
0603000307	060300030701 (East Fork Mulberry Creek)
	060300030702 (West Fork Mulberry Creek)
0603000308	060300030801 (Upper Cane Creek)
	060300030802 (Lower Cane Creek)
0603000309	060300030901 (Elk River)
	060300030902 (Swan Creek)
	060300030903 (Elk River)
	060300030904 (Bradshaw Creek)
	060300030905 (Elk 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. 0603000301.

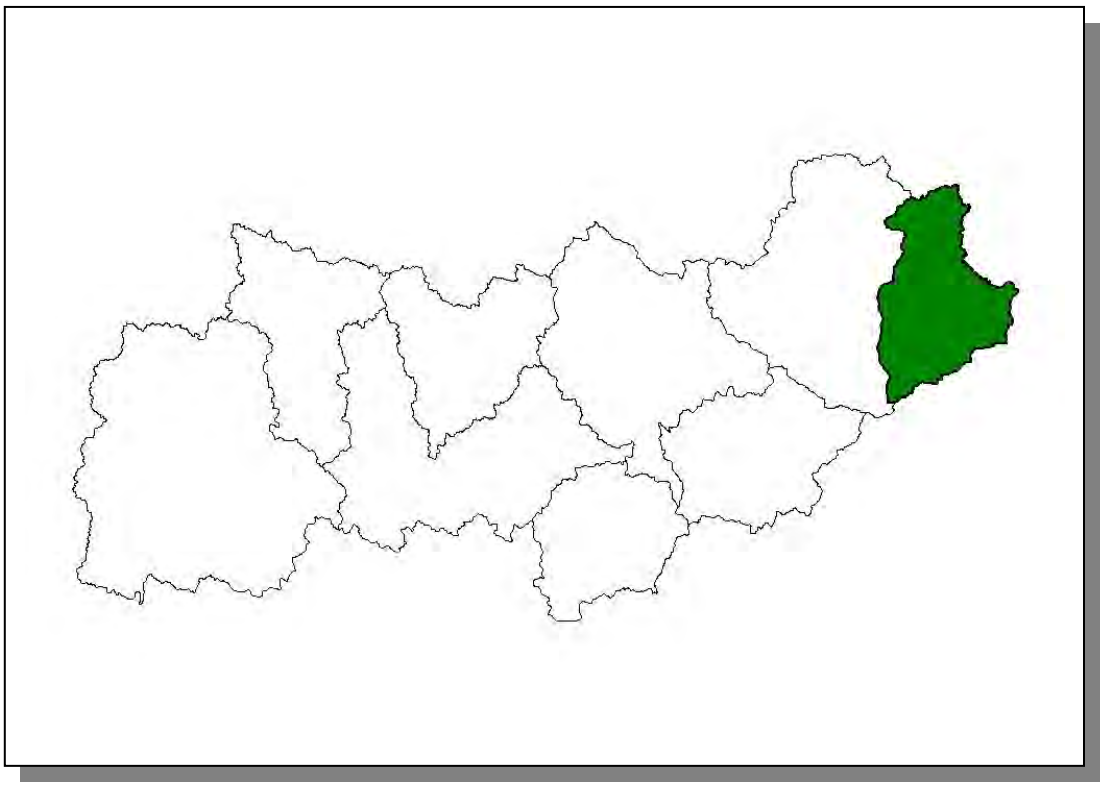


Figure 4-2. Location of Subwatershed 0603000301. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.A.i. General Description.

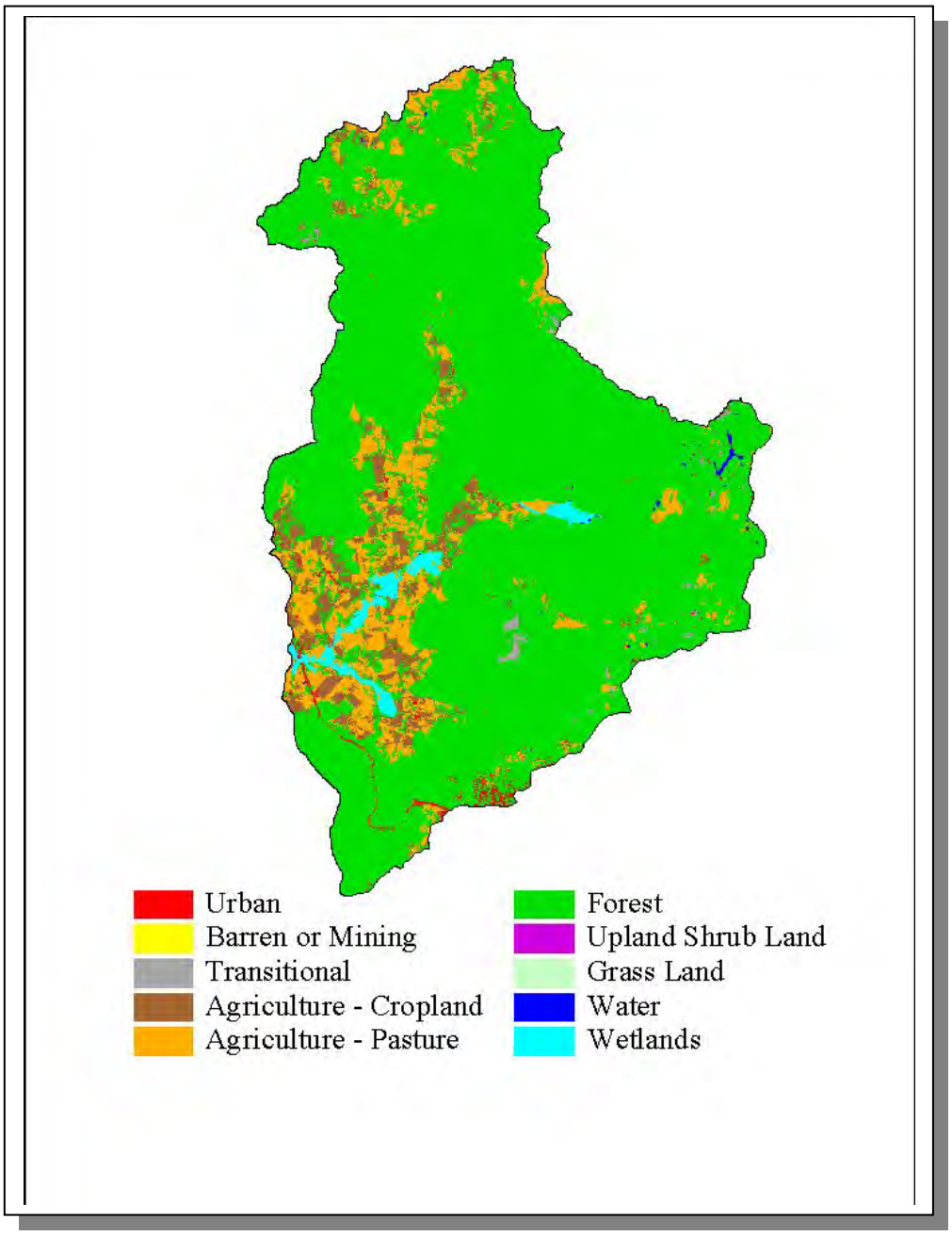


Figure 4-3. Illustration of Land Use Distribution in Subwatershed 0603000301.

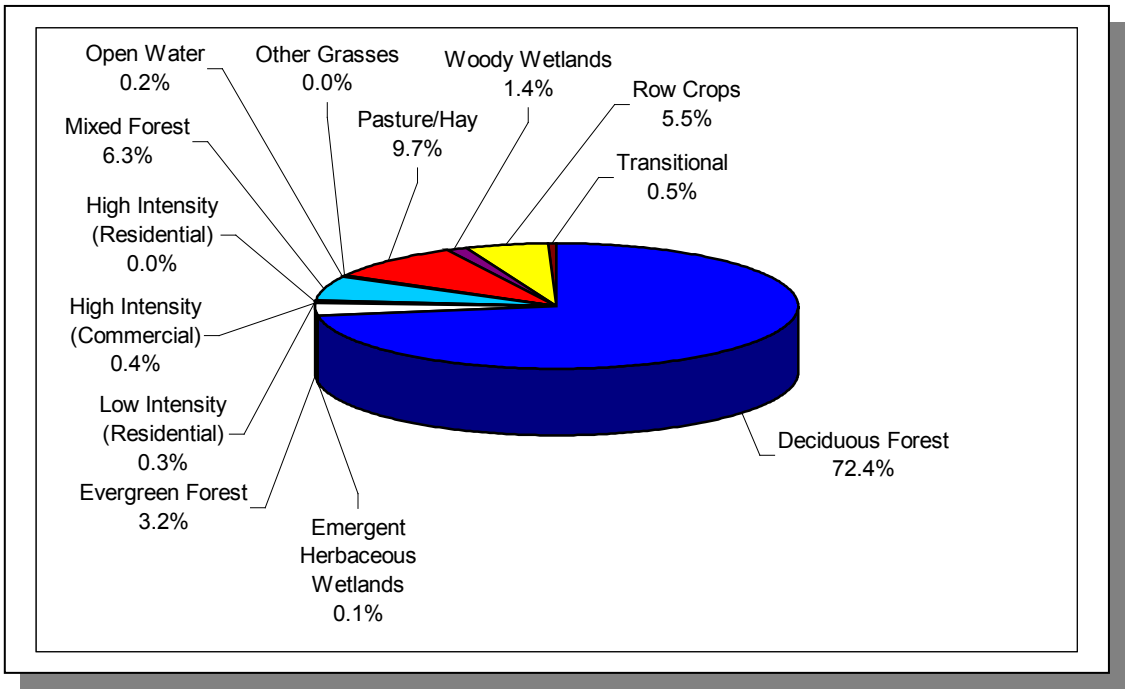


Figure 4-4. Land Use Distribution in Subwatershed 0603000301. *More information is provided in Upper Elk River-Appendix IV.*

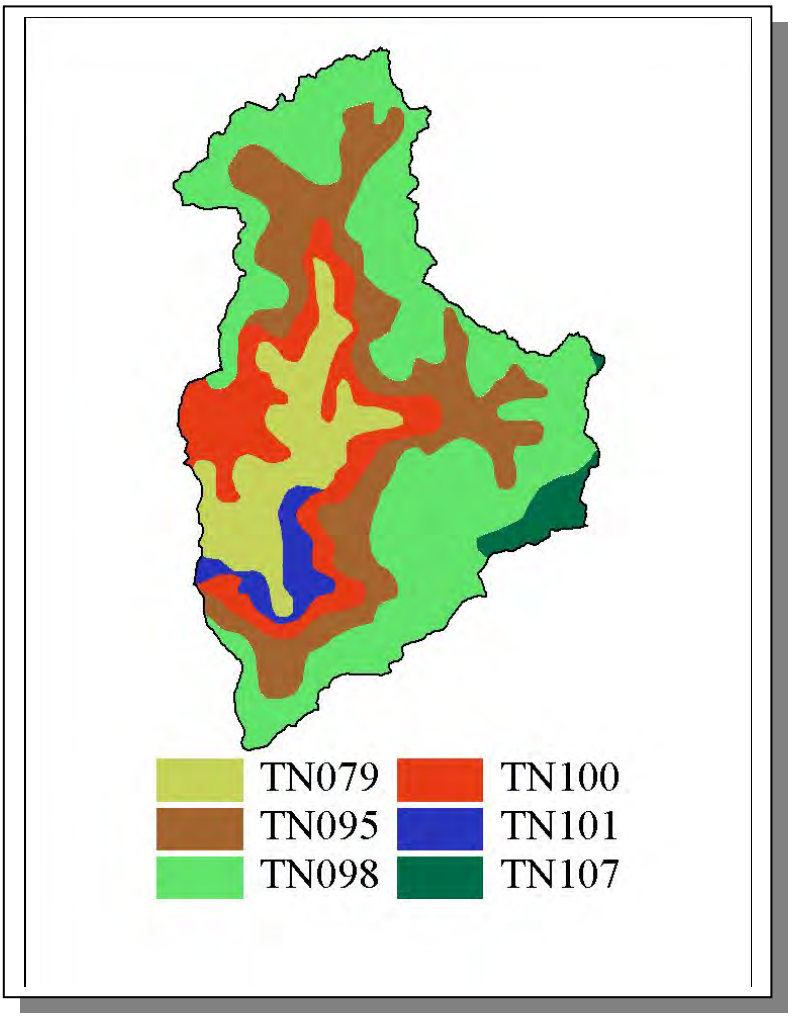


Figure 4-5. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000301.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN079	8.00	C	1.30	5.66	Silty Loam	0.35
TN095	0.00	B	2.35	5.12	Loam	0.31
TN098	1.00	C	3.98	4.82	Loam	0.32
TN100	0.00	B	1.14	3.35	Silty Loam	0.21
TN101	0.00	B	1.71	5.39	Loam	0.35
TN107	1.00	C	6.34	4.84	Loam	0.28

Table 4-2. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000301. *More details are provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Coffee	40,339	45,347	0.16	63	71	12.7
Franklin	34,725	37,152	0.12	41	44	7.3
Grundy	13,362	14,012	24.53	3,277	3,437	4.9
Marion	24,860	26,674	0.16	40	42	5.0
Totals	**113,286**	**123,185**		**3,421**	**3,594**	**5.1**

Table 4-3. Population Estimates in Subwatershed 0603000301.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Coalmont	Grundy	857	300	4	268	28
Monteagle	Marion	1,187	453	258	191	4
Tracy City	Grundy	1,512	660	43	603	14
Total		**3,556**	**1,413**	**305**	**1,062**	**46**

Table 4-4. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0603000301.

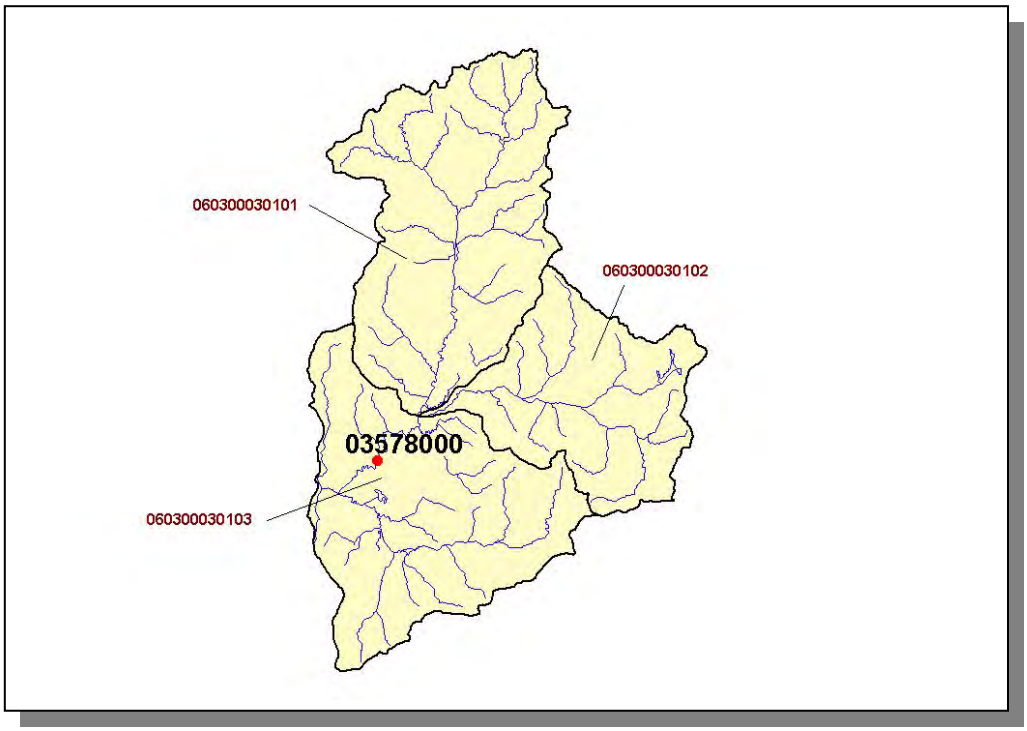


Figure 4-6. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000301. *Subwatershed 060300030101, 060300030102, and 060300030103 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

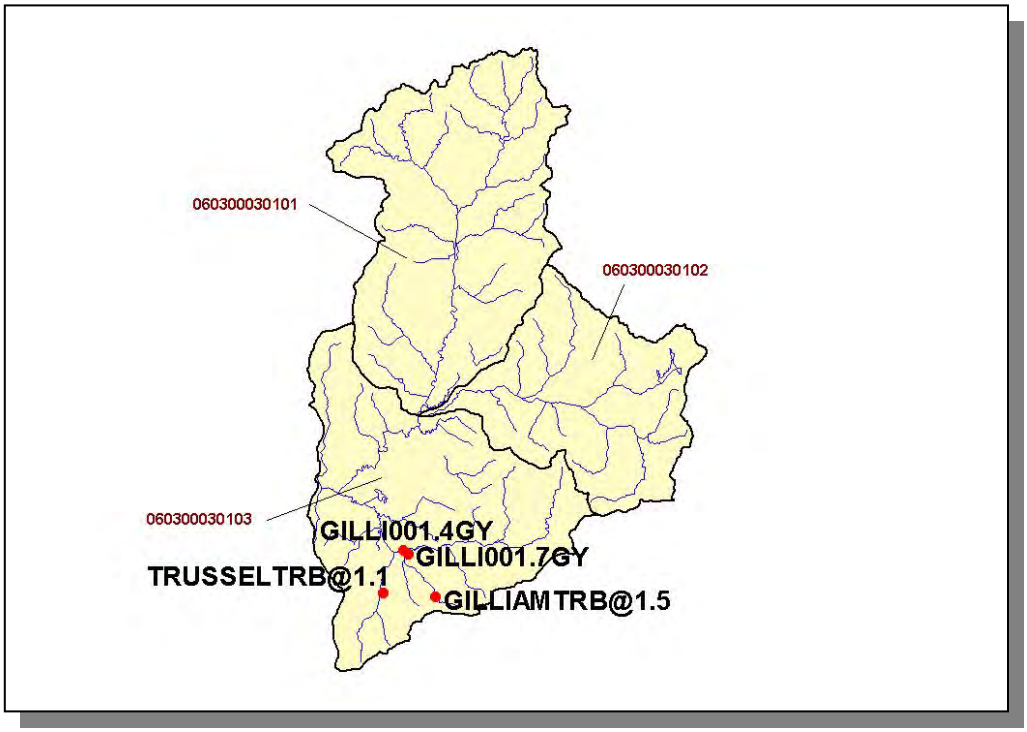


Figure 4-7. Location of STORET Monitoring Sites in Subwatershed 0603000301. *Subwatershed 060300030101, 060300030102, and 060300030103 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.A.ii. Point Source Contributions.

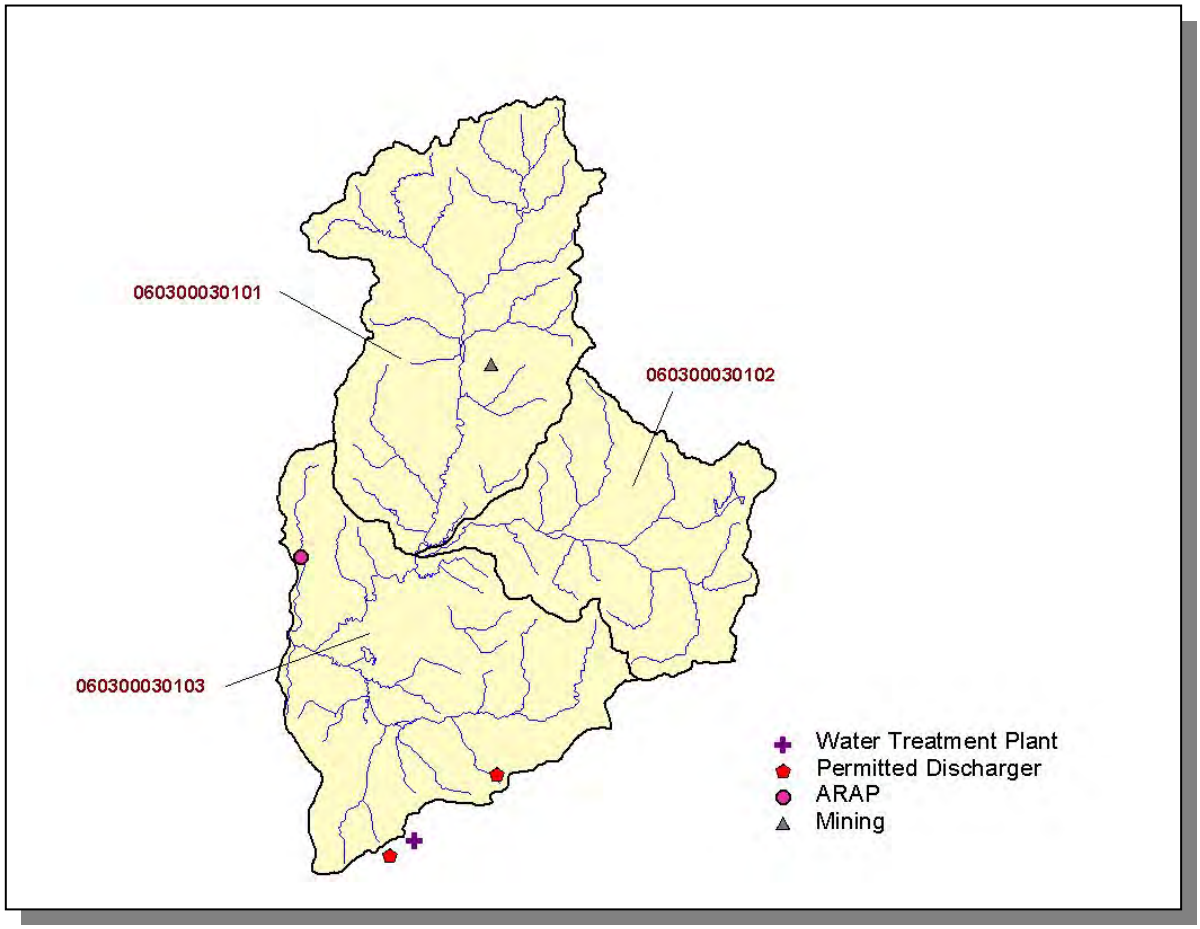


Figure 4-8. Location of Active Point Source Facilities in Subwatershed 0603000301. *Subwatershed 060300030101, 060300030102, and 060300030103 boundaries are shown for reference. More information is provided in the following charts.*

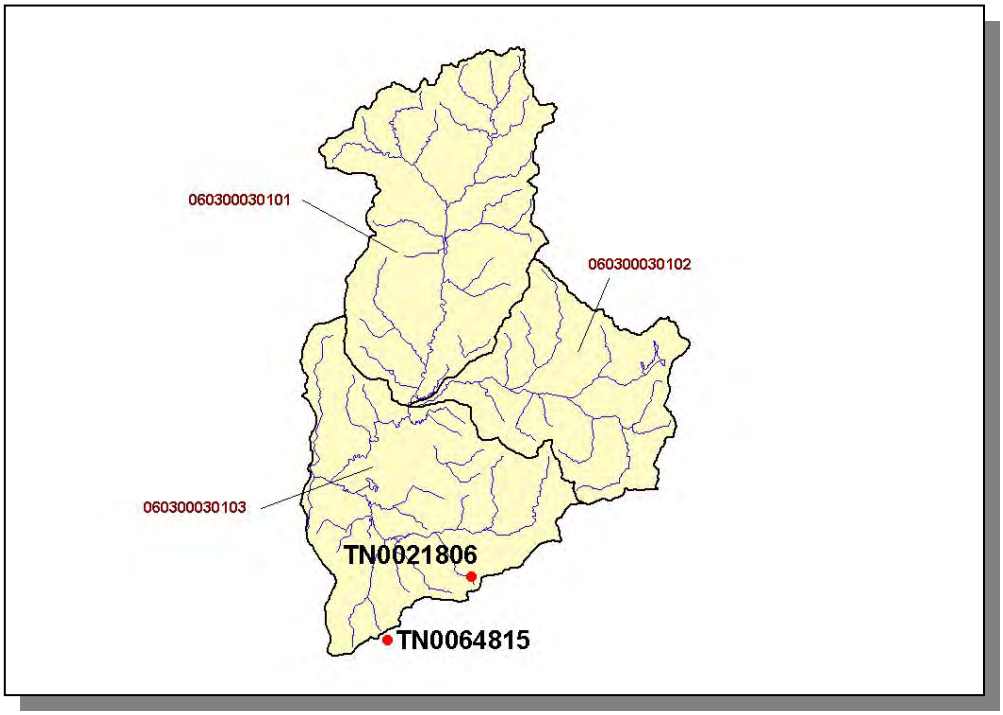


Figure 4-9. Location of Active Point Source Facilities in Subwatershed 0603000301. *Subwatershed 060300030101, 060300030102, and 060300030103 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

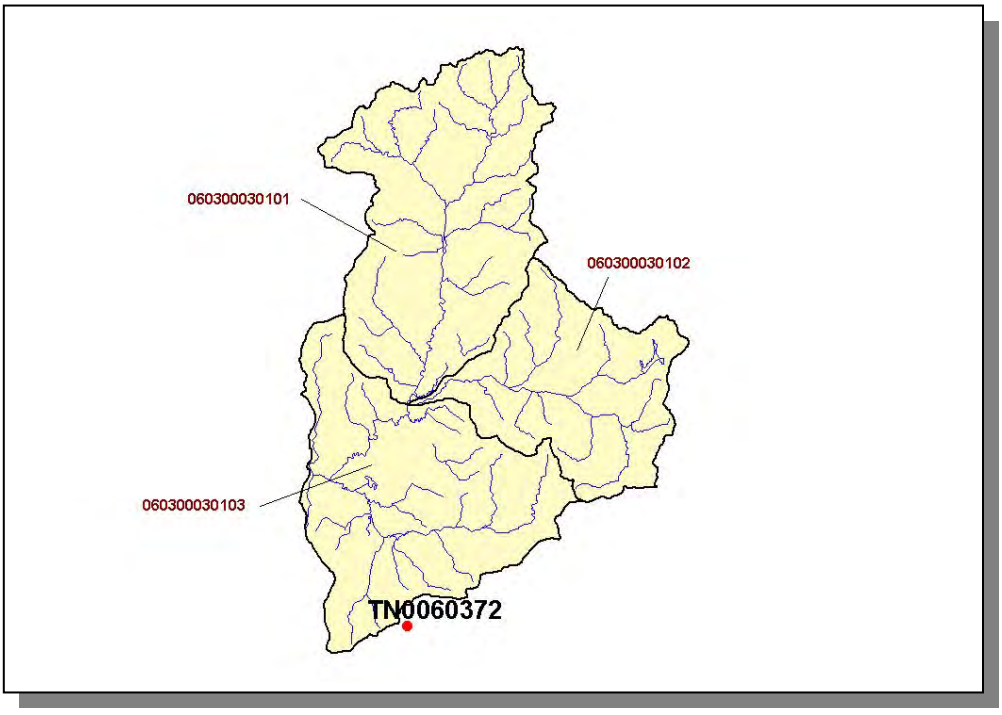


Figure 4-10. Location of Water Treatment Plant Sites in Subwatershed 0603000301. *Subwatershed 060300030101, 060300030102, and 060300030103 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

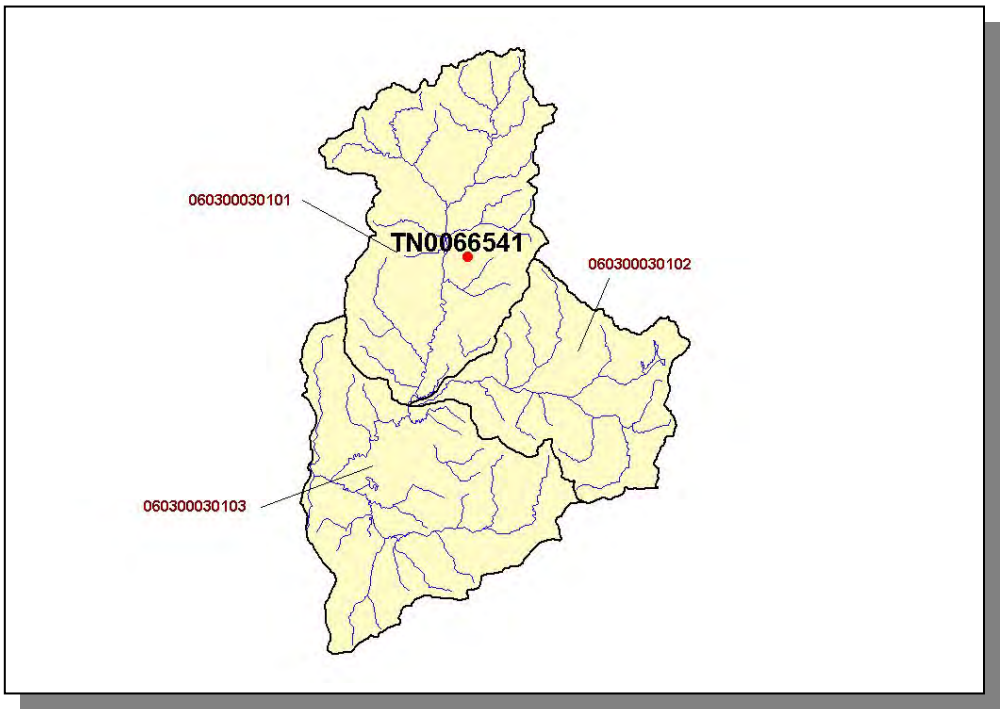


Figure 4-11. Location of Active Mining Sites in Subwatershed 0603000301. *Subwatershed 060300030101, 060300030102, and 060300030103 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

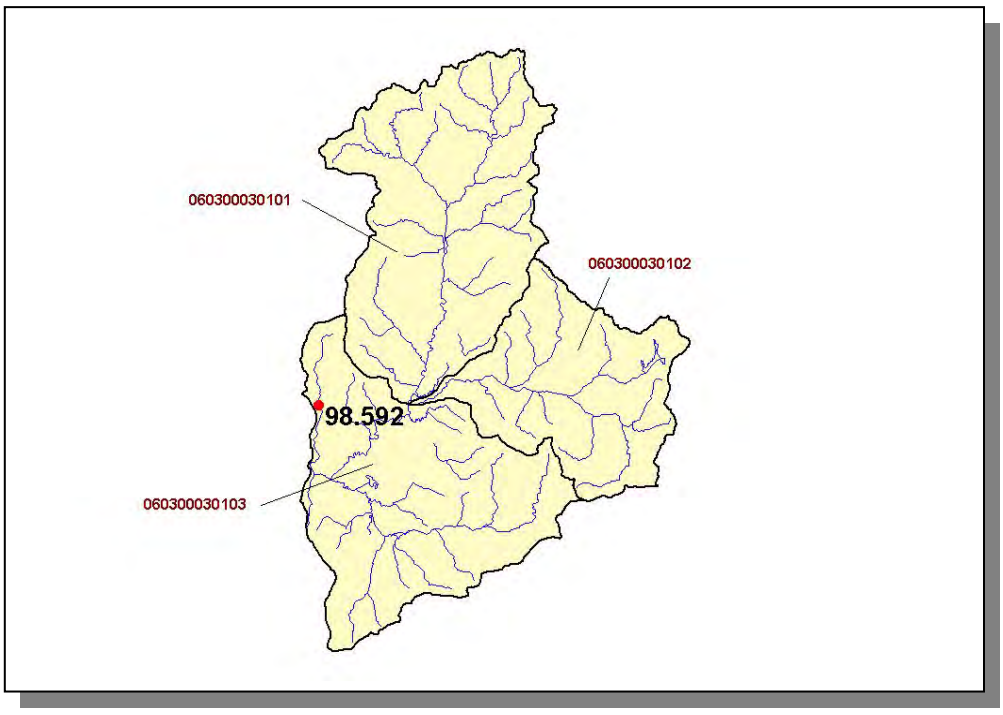


Figure 4-12. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000301. *Subwatershed 060300030101, 060300030102, and 060300030103 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

4.2.A.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
1,367	3,195	193	6	5,325,369	725	0

Table 4-5. Summary of Livestock Count Estimates in Subwatershed 0603000301. *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)
Coffee	114.4	114.2	2.8	12.7
Franklin	183.4	183.0	6.0	28.7
Grundy	174.5	165.9	5.6	17.7
Totals	**472.3**	**463.1**	**14.4**	**59.1**

Table 4-6. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 0603000301.

CROPS	TONS/ACRE/YEAR
Corn (Row Crops)	5.14
Soybeans (Row Crops)	4.73
Cotton (Row Crops)	4.03
Grass (Hayland)	0.39
Legume (Hayland)	1.64
Legume/Grass (Hayland)	0.19
Grass (Pastureland)	0.79
Grass,Forbs, Legumes (Mixed Pasture)	0.36
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Conservation Reserve Program Land	0.11
Wheat (Close Grown Cropland)	9.69
All Other Close Grown Cropland	5.82
Other Vegetable and Truck Crops	5.99
Other (Horticultural)	4.58
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.28
Other Cropland (Not Planted)	4.35

Table 4-7. Annual Estimated Total Soil Loss in Subwatershed 0603000301.

4.2.B. 0603000302.

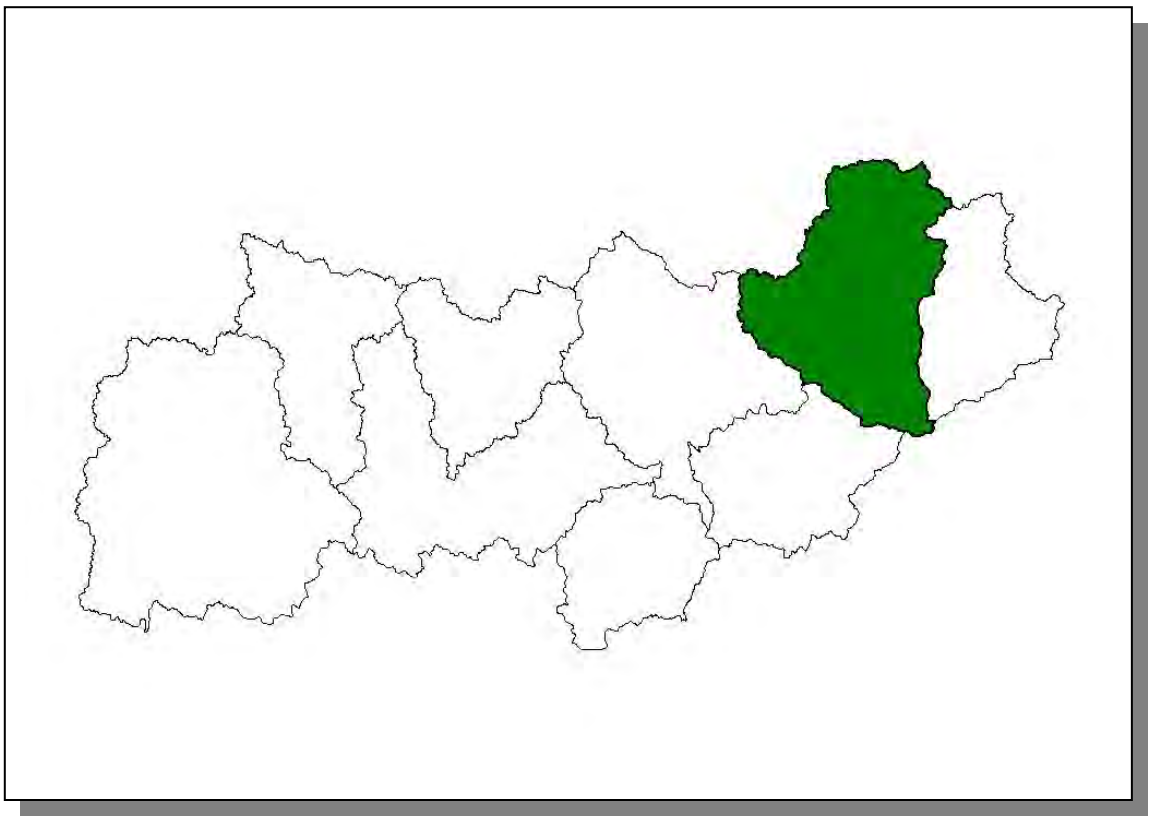


Figure 4-13. Location of Subwatershed 0603000302. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.B.i. General Description.

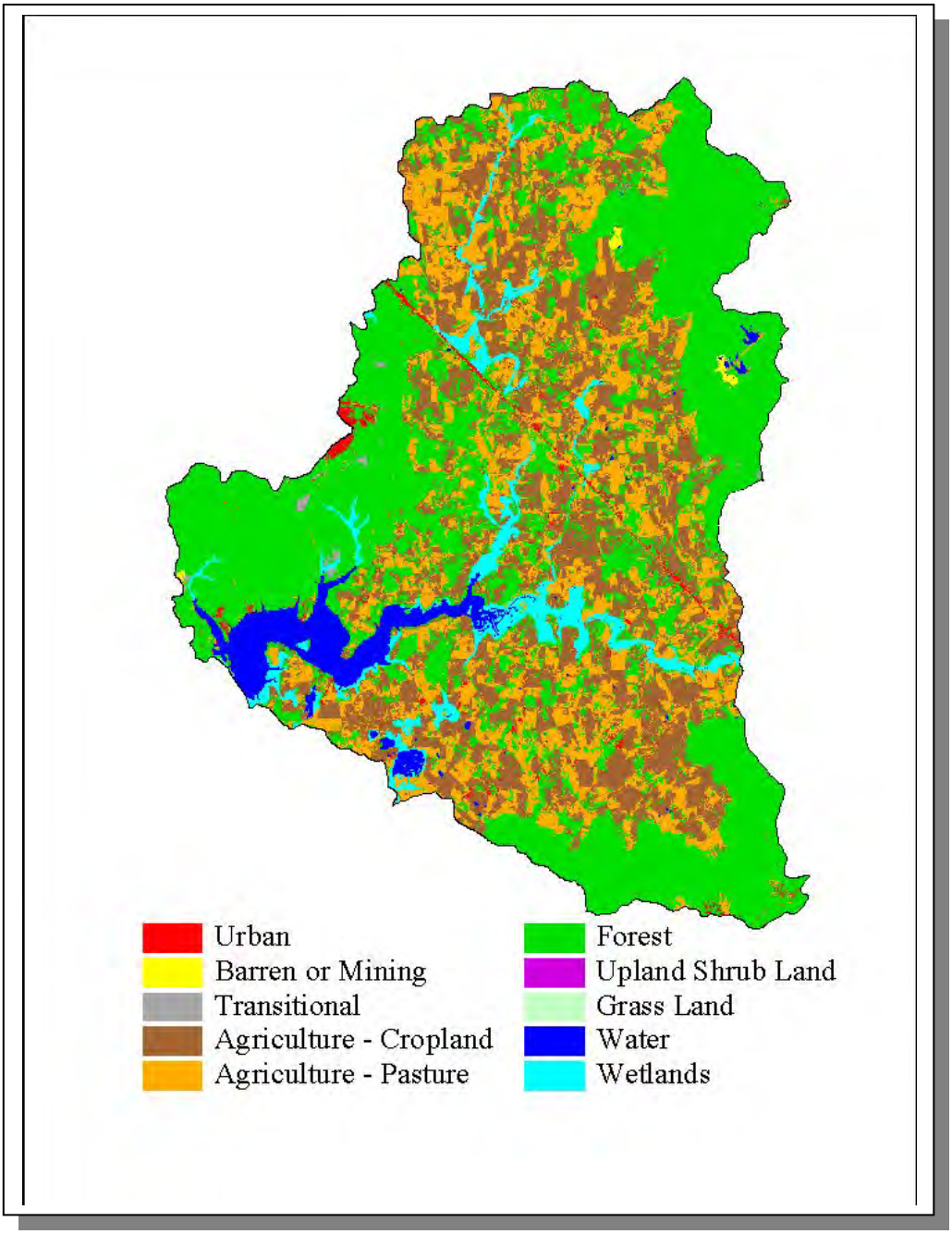


Figure 4-14. Illustration of Land Use Distribution in Subwatershed 0603000302.

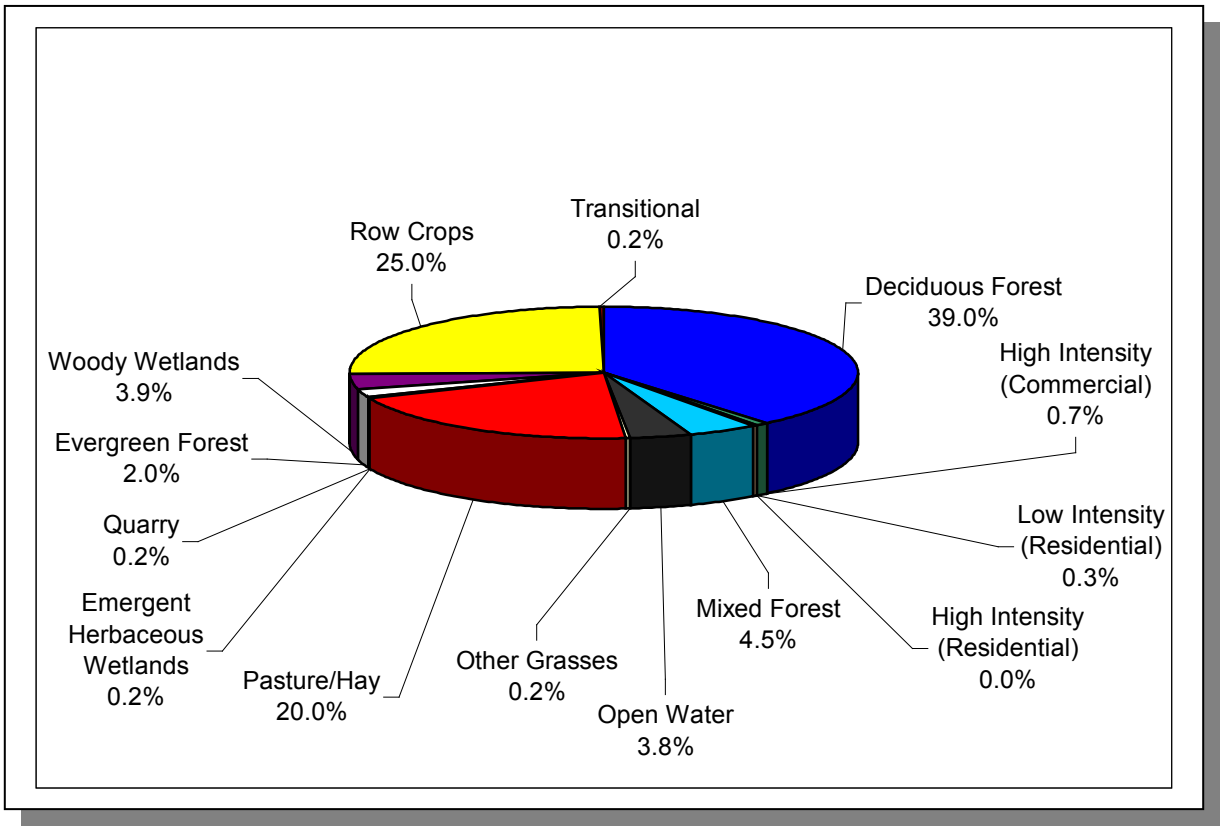


Figure 4-15. Land Use Distribution in Subwatershed 0603000302. *More information is provided in Upper Elk-Appendix IV.*

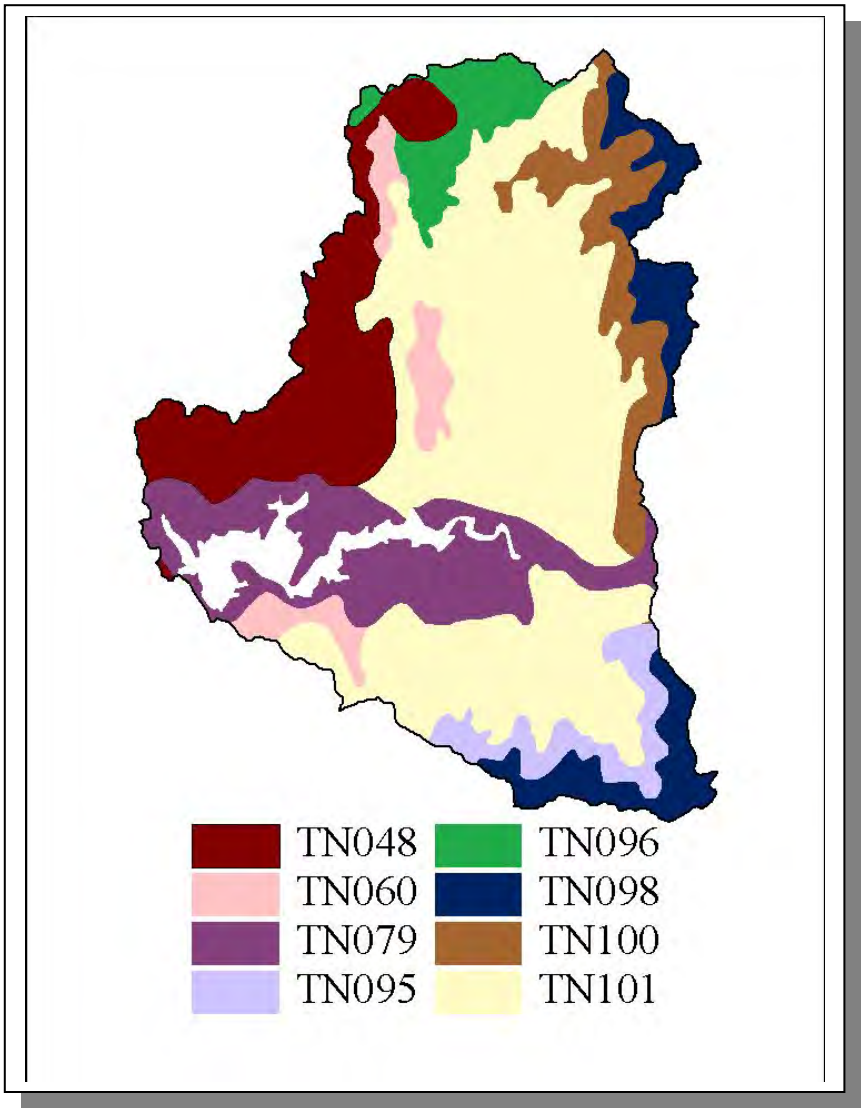


Figure 4-16. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000302.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN048	8.00	C	1.38	5.06	Silty Loam	0.42
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN079	8.00	C	1.30	5.66	Silty Loam	0.35
TN095	0.00	B	2.35	5.12	Loam	0.31
TN096	1.00	C	1.22	5.16	Silty Loam	0.38
TN098	1.00	C	3.98	4.82	Loam	0.32
TN100	0.00	B	1.14	3.35	Silty Loam	0.21
TN101	0.00	B	1.71	5.39	Loam	0.35

Table 4-8. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000302. *More information is provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		% CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Coffee	40,339	45,347	20.46	8,253	9,277	12.4
Franklin	34,725	37,152	13.03	4,526	4,842	7.0
Grundy	13,362	14,102	1.8	240	252	5.0
Total	**88,426**	**96,601**		**13,019**	**14,371**	**1.10**

Table 4-9. Population Estimates in Subwatershed 0603000302.

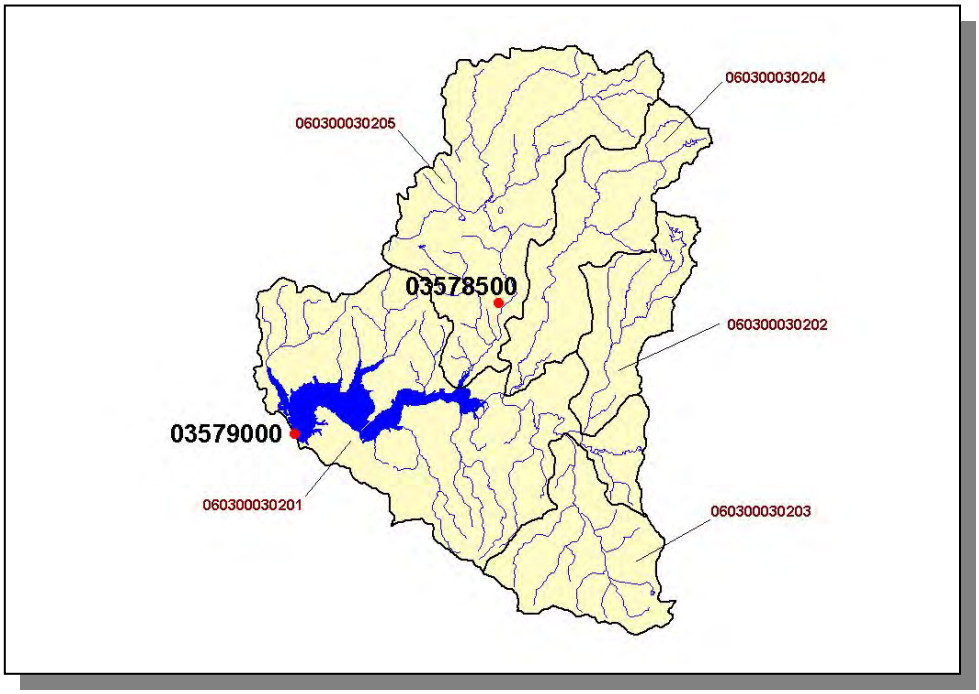


Figure 4-17. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

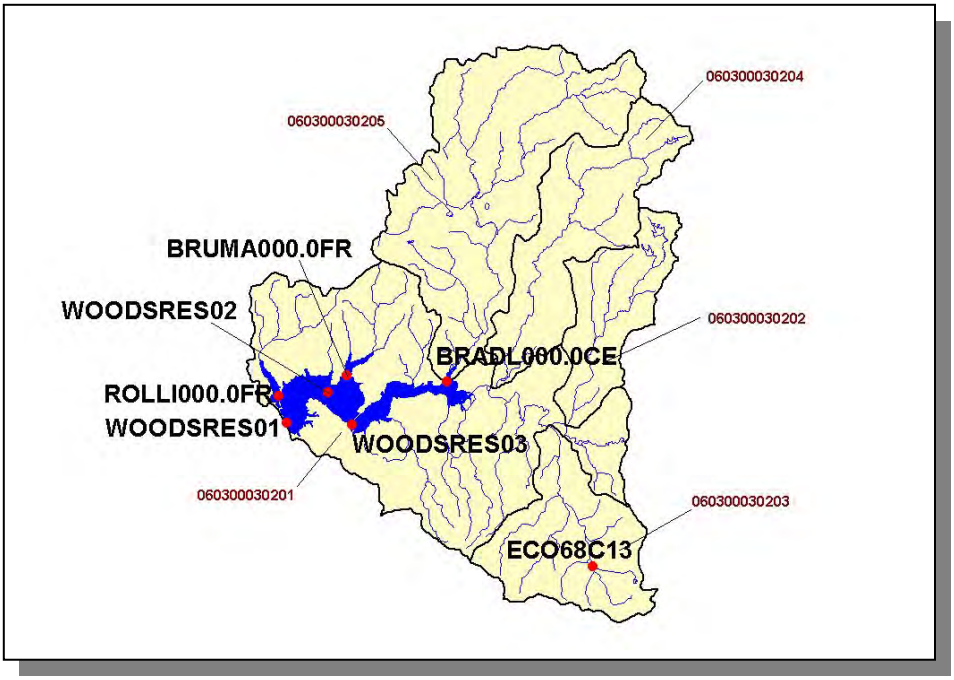


Figure 4-18. Location of STORET Monitoring Sites in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.B.ii. Point Source Contributions.

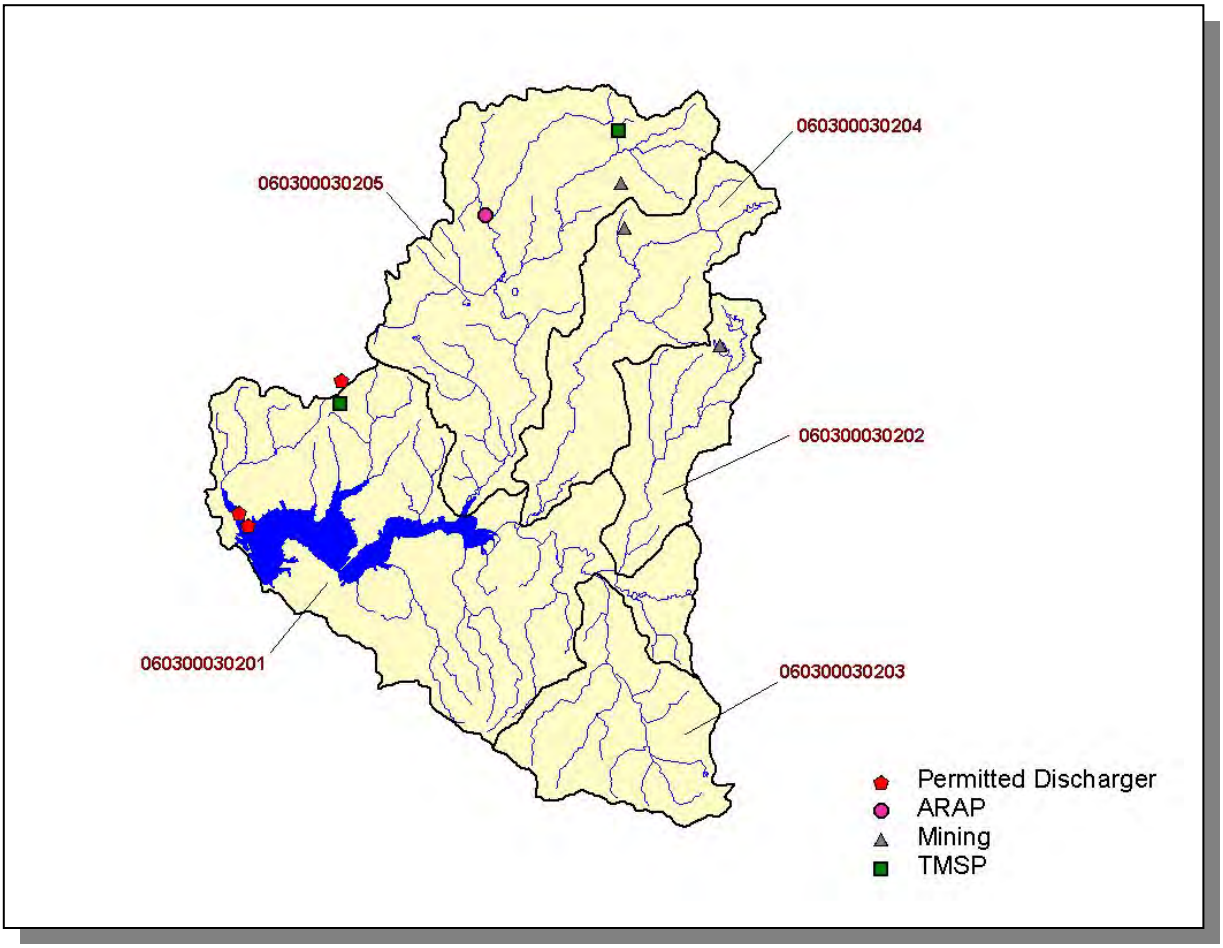


Figure 4-19. Location of Active Point Source Facilities in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. More information is provided in the following charts.*

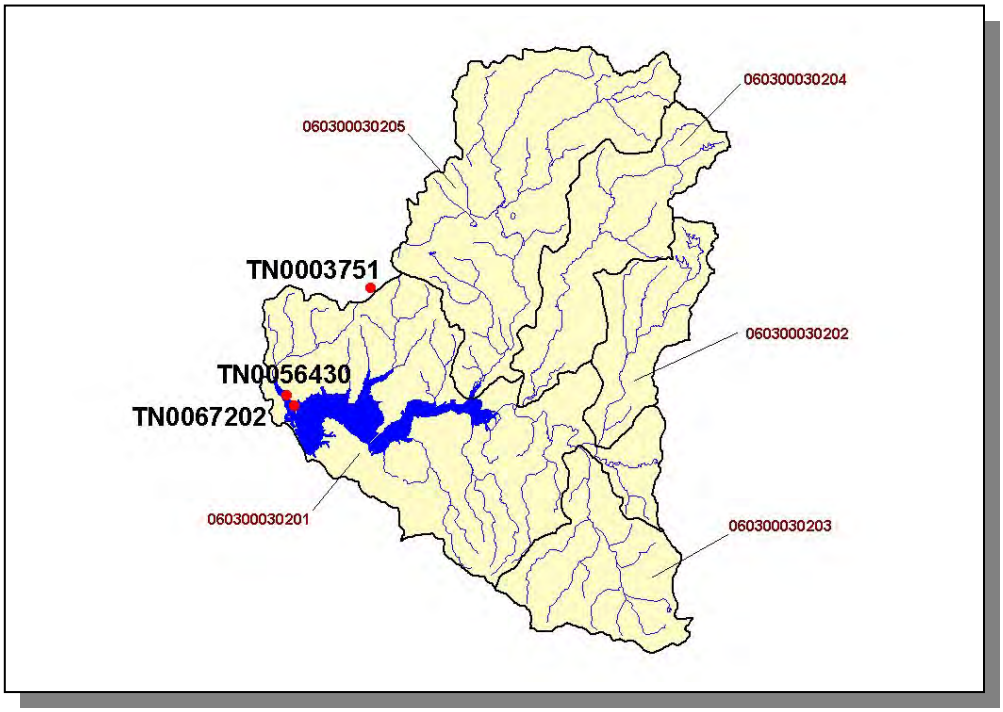


Figure 4-20. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

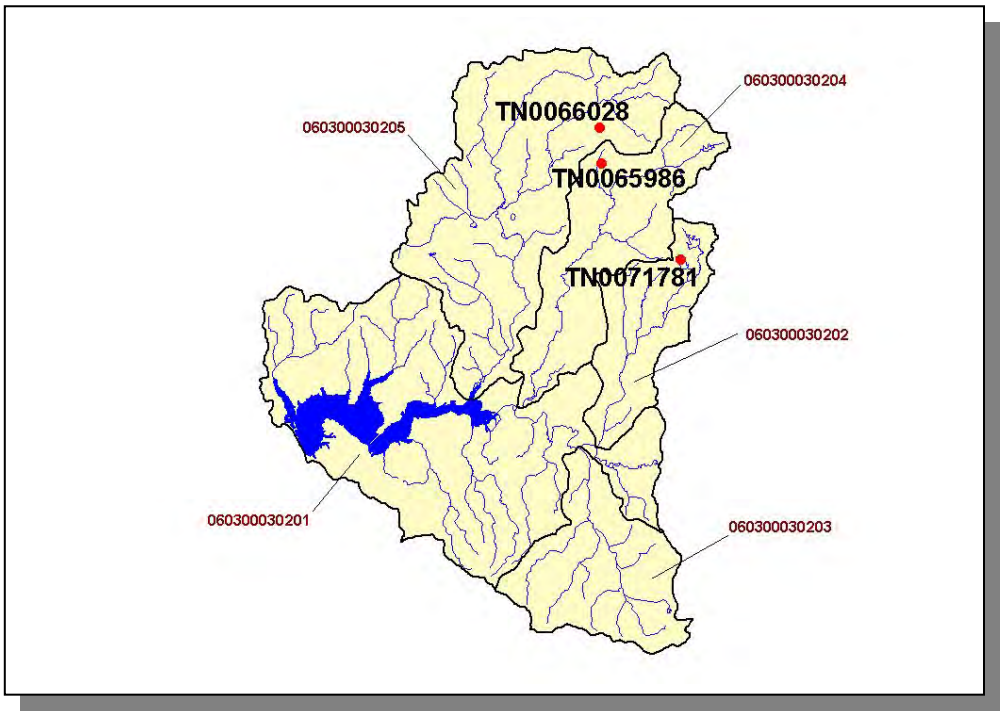


Figure 4-21. Location of Active Mining Sites in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

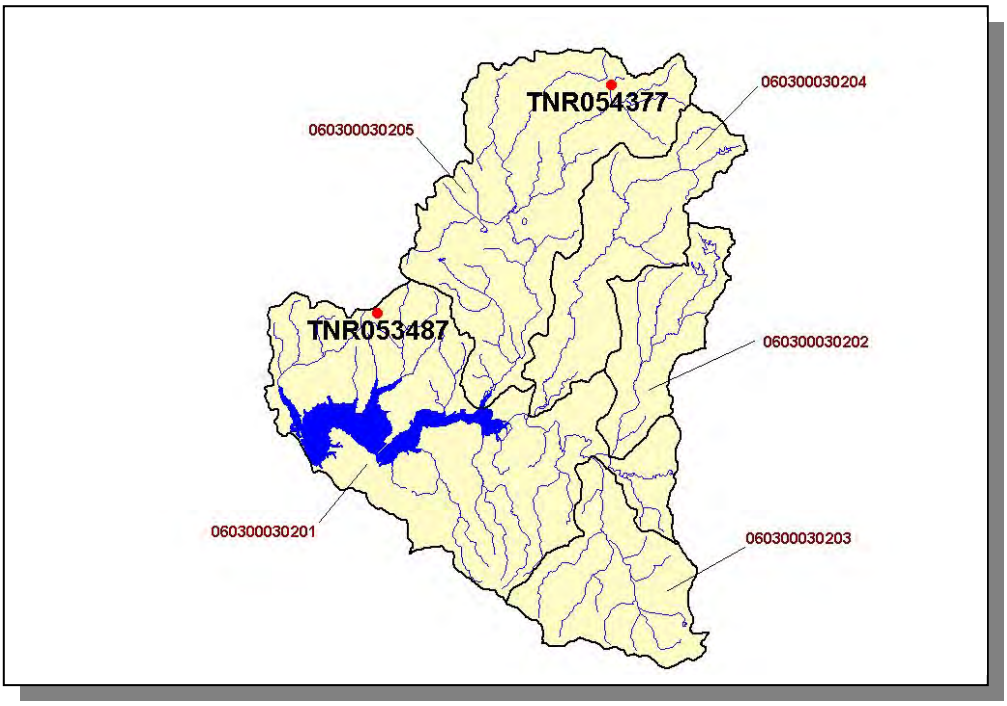


Figure 4-22. Location of TMSP Facilities in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

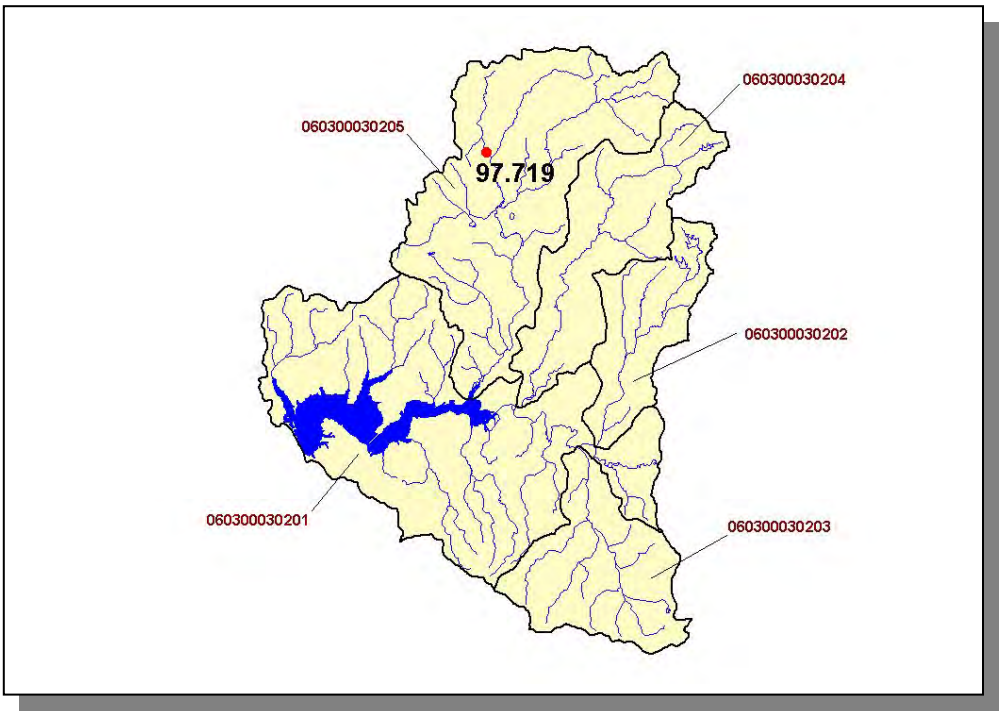


Figure 4-23. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

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

There are three NPDES facilities discharging to water bodies listed on the 1998 303(d) list in Subwatershed 0603000302:

- TN0003751 (AEDC) discharges to Bradley, Brumalow, Rowland, and Spring Creeks and to Woods Reservoir
- TN0056430 (UT Space Institute) discharges to Rollins Creek @ RM 1.1
- TN0067202 (UT Space Institute) discharges to Rollins Creek Embayment of Woods Reservoir

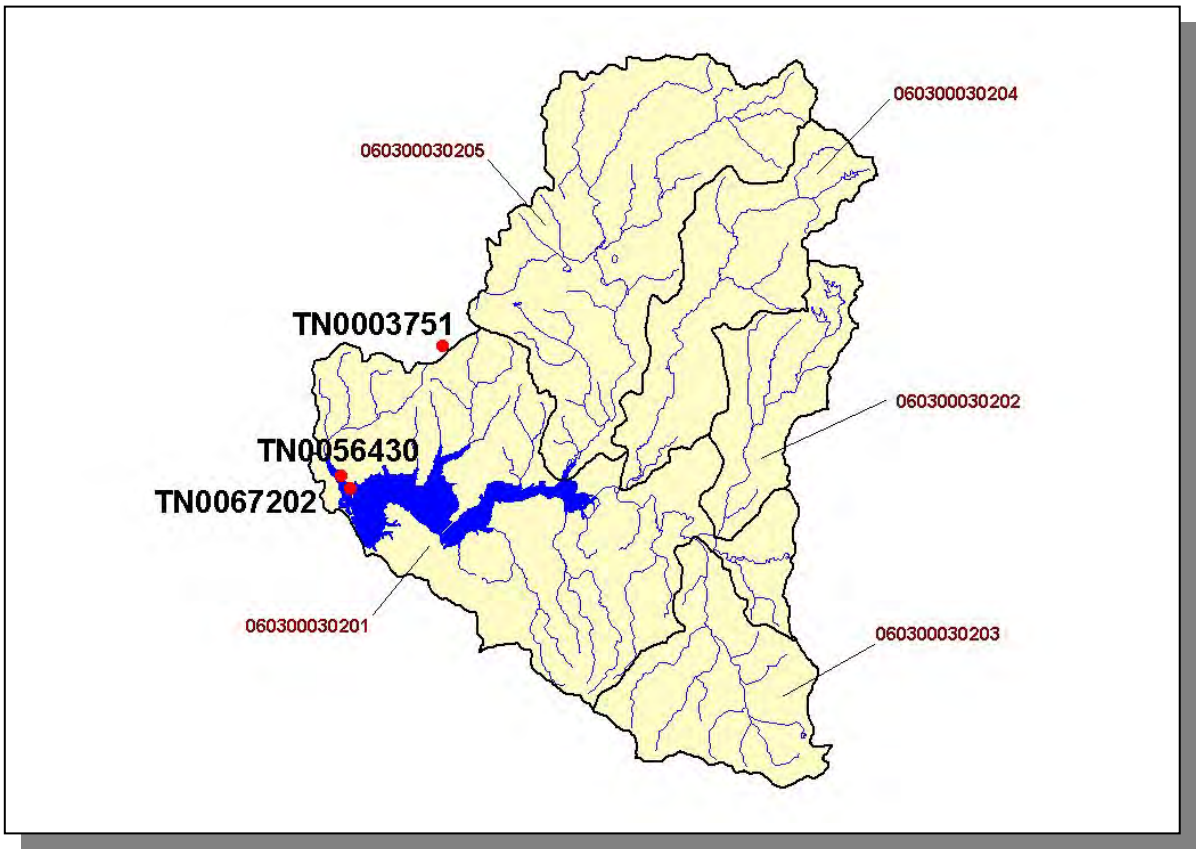


Figure 4-24. Location of NPDES Dischargers to Water Bodies Listed on the 1998 303(d) List in Subwatershed 0603000302. *Subwatershed 060300030201, 060300030202, 060300030203, 060300030204, and 060300030205 boundaries are shown for reference. The names of facilities are provided in Upper Elk-Appendix IV.*

PERMIT #	1Q10	3Q10	7Q10	3Q20	QDESIGN
TN0003751				0.00	Varies by Outfall
TN0056430				0.00	0.00630
TN0067202					0.02

Table 4-10. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000302. *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 #	DO	TDS	TSS	pH	OIL and GREASE	SETTLEABLE SOLIDS	FECAL COLIFORM	NH_3	$CBOD_5$	TEMP	TRC	TSS
TN0003751	X		X	X	X	X	X	X	X	X	X	X
TN0056430		X		X	X							X
TN0067202	X		X	X				X	X		X	

Table 4-11. Parameters Monitored for Daily Maximum (mg/L) Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000302. *TDS, Total Dissolved Solids; TSS, Total Suspended Solids; TCR, Total Residual Chlorine.*

PERMIT #	Ag	Cu	Cd	Cr (Total)	Pb
TN0003751	X	X	X	X	X

Table 4-12a. Inorganic Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000302.

PERMIT #	FLOW	71-55-6	75-35-4	79-01-6	127-18-4	75-09-2
TN0003751	X	X	X	X	X	X

Table 4-12b. Parameters Monitored by NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000302. *CAS (Chemical Abstract System) Codes: 71-55-6, Trichloroethane; 75-35-4, 1,1-Dichloroethene; 79-01-6, Trichloroethene; 127-18-4, Tetrachloroethene; 75-09-2, Methylene Chloride.*

4.2.B.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
5,608	13,816	1,281	12	2,607,744	3,475	85

Table 4-13. Summary of Livestock Count Estimates in Subwatershed 0603000302. *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)
Coffee	114.4	114.2	2.8	12.7
Franklin	183.4	183.0	6.0	28.7
Grundy	174.5	165.9	5.6	17.7
Total	**472.3**	**463.1**	**14.4**	**59.1**

Table 4-14. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0603000302.

CROPS	TONS/ACRE/YEAR
Legume/Grass (Hayland)	0.16
Grass (Hayland)	0.72
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Corn (Row Crops)	8.29
Soybeans (Row Crops)	10.34
Cotton (Row Crops)	4.03
Wheat (Close Grown Cropland)	10.08
Grass (Pastureland)	0.94
Grass, Forbs, Legumes (Mixed Pasture)	0.38
Other Vegetable and Truck Crop	4.37
Other (Horticulture)	2.14
Other Cropland not Planted	4.56
Conservation Reserve Program Land	0.11
Non Agricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.16

Table 4-15. Annual Estimated Total Soil Loss in Subwatershed 0603000302.

4.2.C. 0603000303.

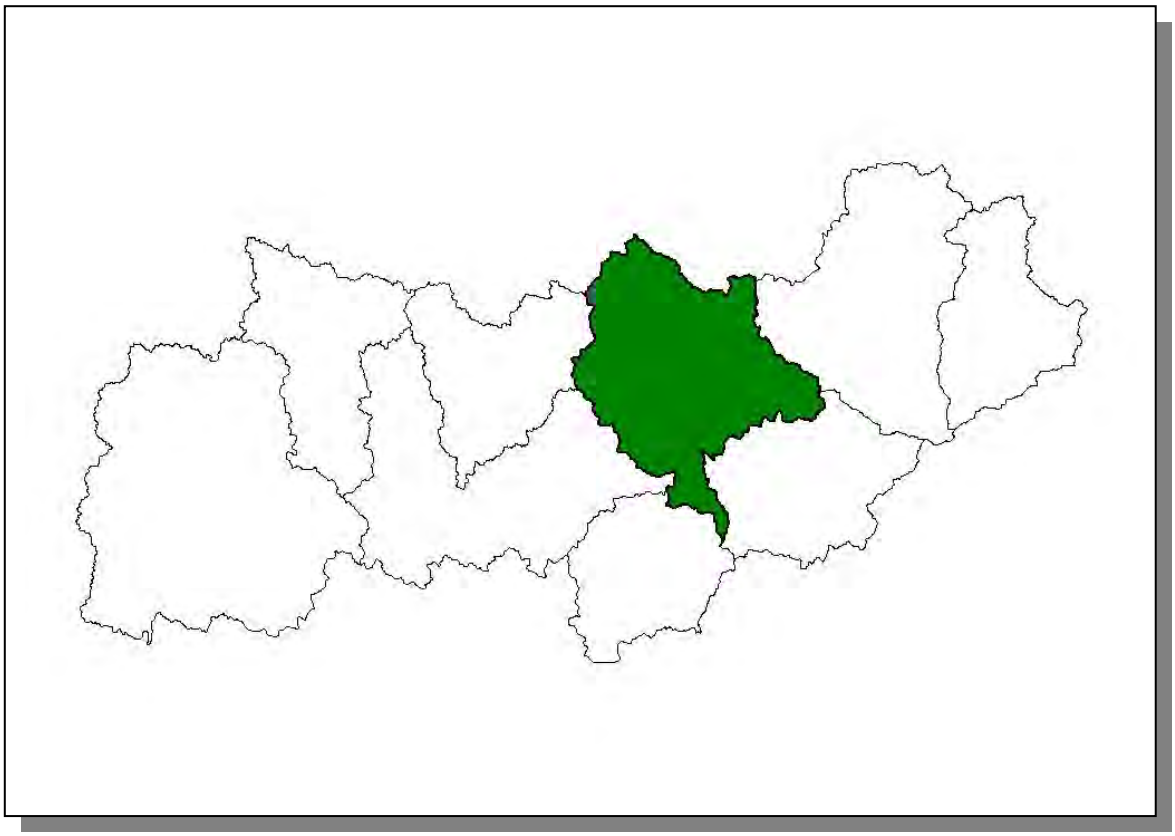


Figure 4-25. Location of Subwatershed 0603000303. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.C.i. General Description.

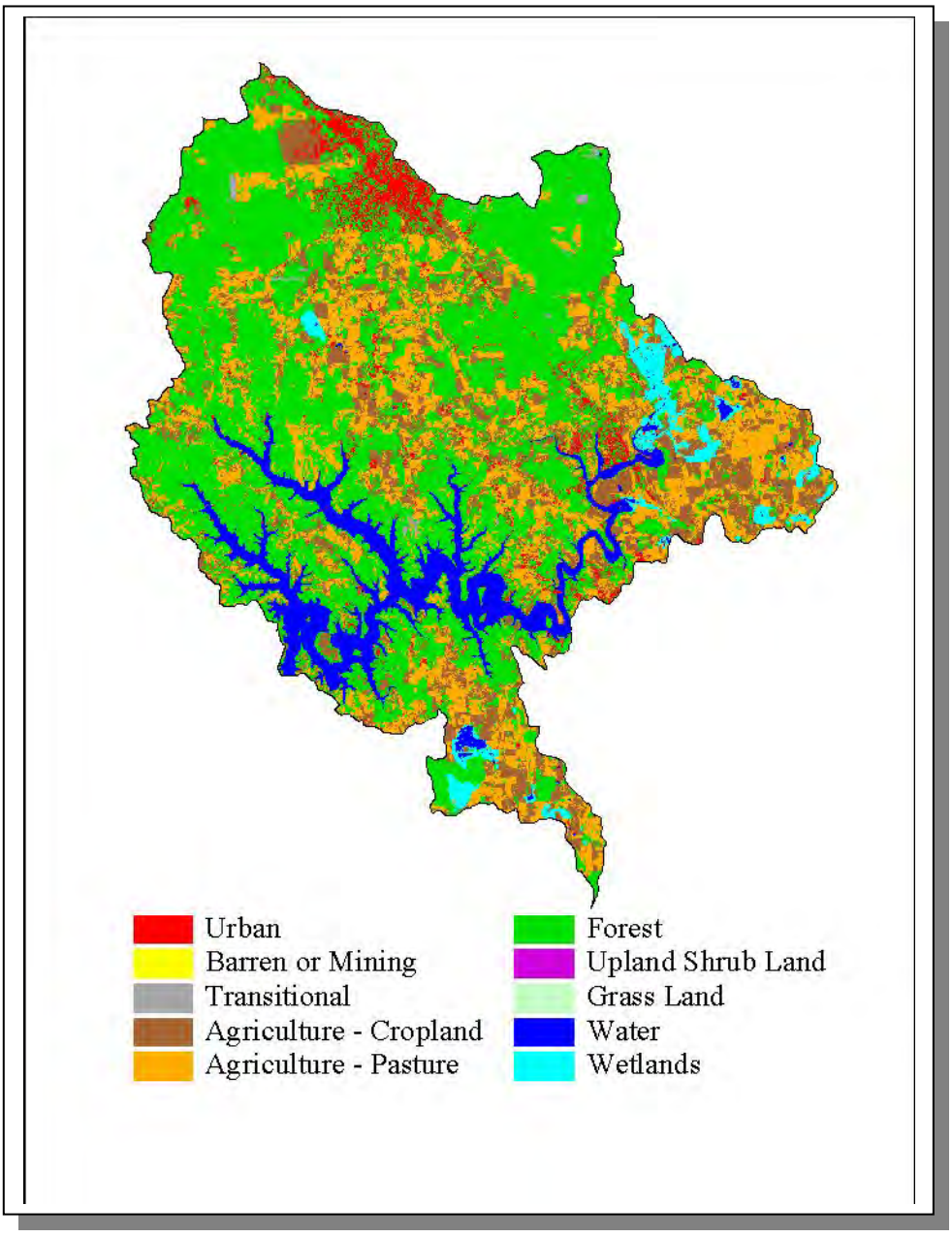


Figure 4-26. Illustration of Land Use Distribution in Subwatershed 0603000303.

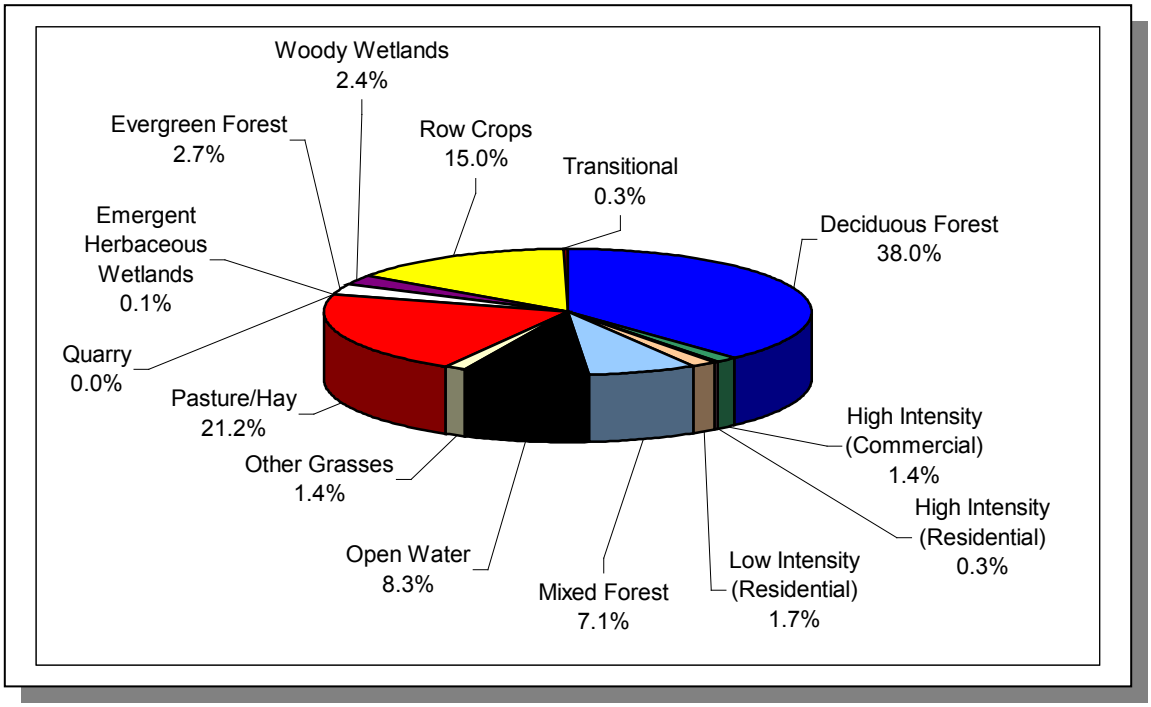


Figure 4-27. Land Use Distribution in Subwatershed 0603000303. *More information is provided in Upper Elk-Appendix IV.*

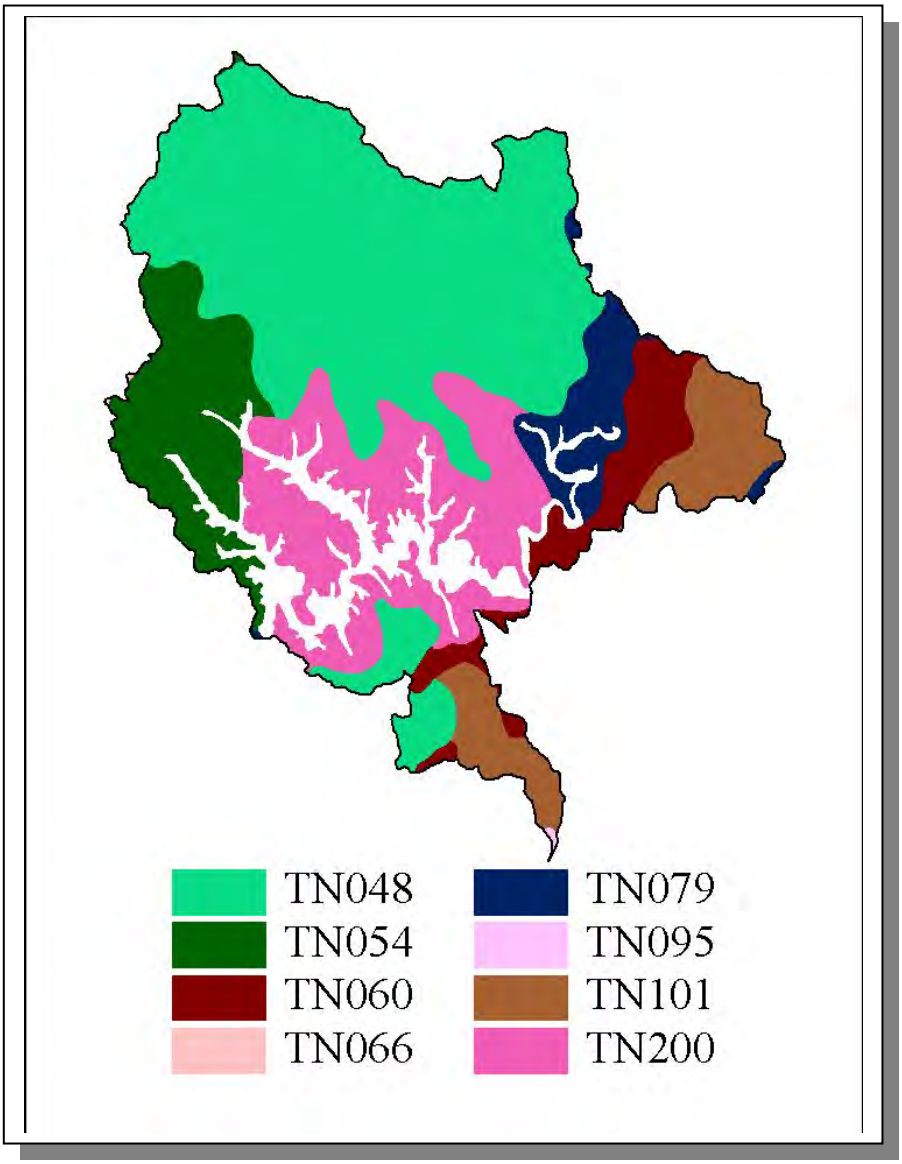


Figure 4-28. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000303.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN048	8.00	C	1.38	5.06	Silty Loam	0.42
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN066	0.00	B	2.62	4.75	Loam	0.28
TN079	8.00	C	1.30	5.66	Silty Loam	0.35
TN095	0.00	B	2.35	5.12	Loam	0.31
TN101	0.00	B	1.71	5.39	Loam	0.35
TN200	1.00	B	2.81	5.28	Loam	0.31

Table 4-16. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000303. *More information is provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Coffee	40,339	45,347	2.22	895	1,006	12.4
Franklin	34,725	37,152	21.86	7,591	8,122	7.0
Moore	4,721	5,205	26.95	1,272	1,403	10.3
Total	**79,785**	**87,704**		**9,758**	**10,531**	**7.9**

Table 4-17. Population Estimates in Subwatershed 0603000303.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Estill Springs	Franklin	1,412	615	50	562	3
Winchester	Franklin	6,305	2,625	2,318	307	0
Tullahoma	Coffee	16,757	7,109	6,184	920	5
Totals		**24,474**	**10,349**	**8,552**	**1,789**	**8**

Table 4-18. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0603000303.

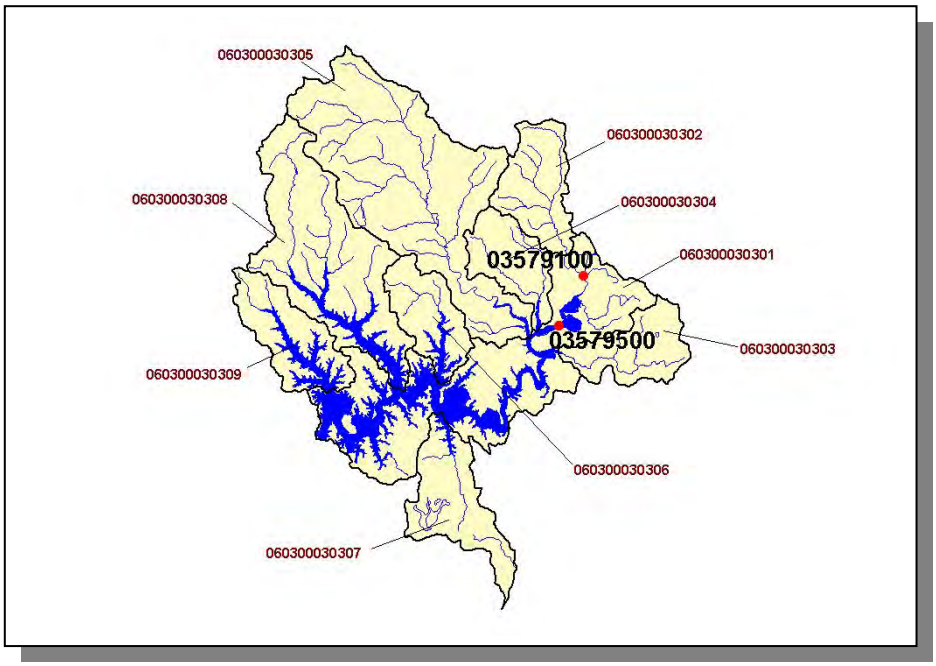


Figure 4-29. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

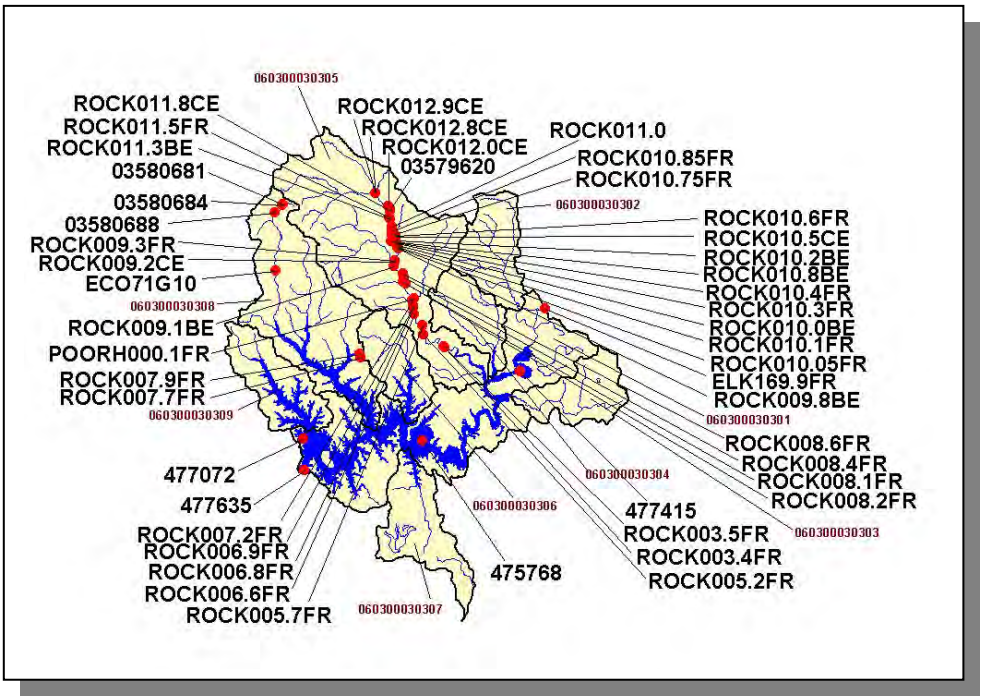


Figure 4-30. Location of STORET Monitoring Sites in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.C.ii. Point Source Contributions.

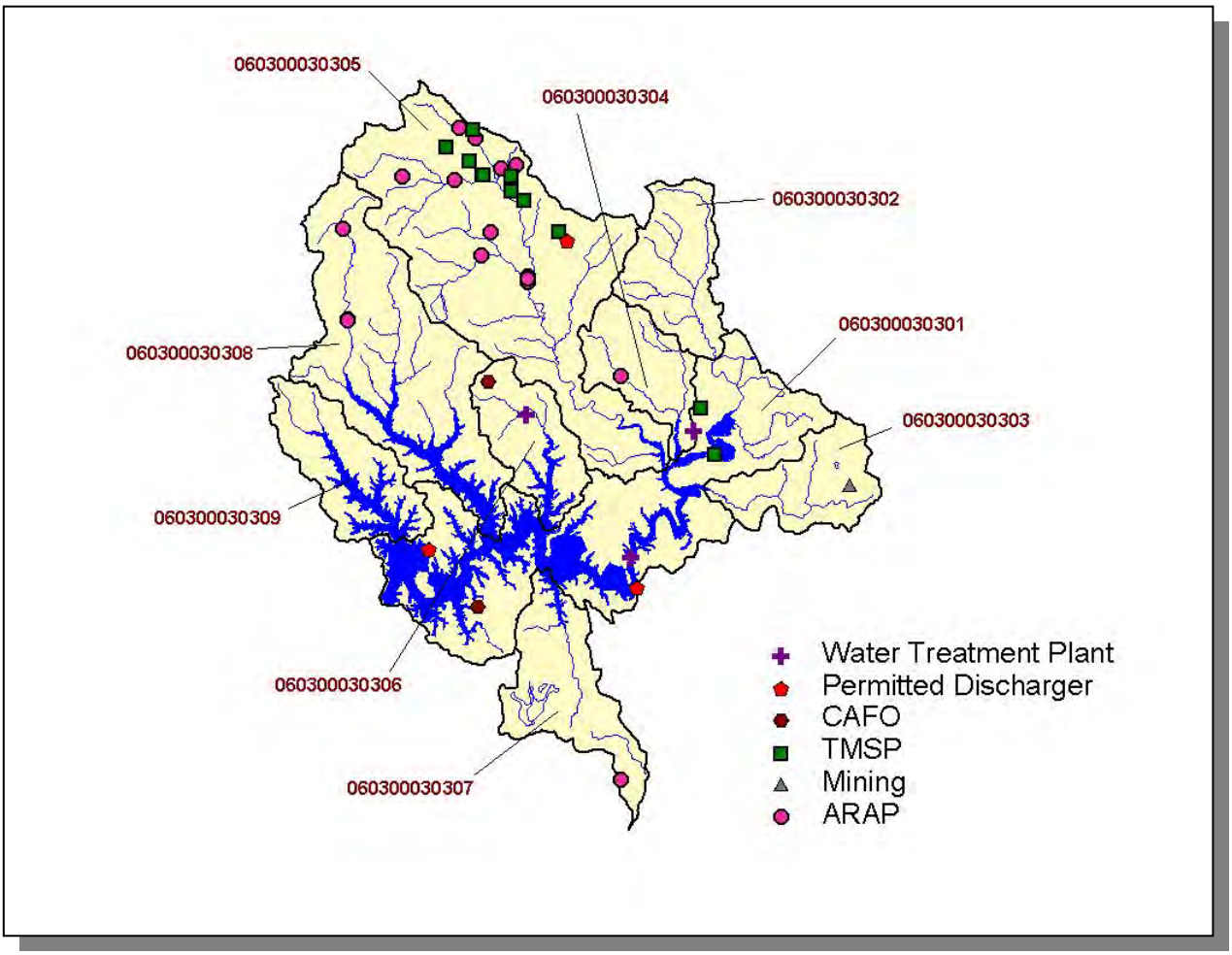


Figure 4-31. Location of Active Point Source Facilities in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information is provided in the following charts.*

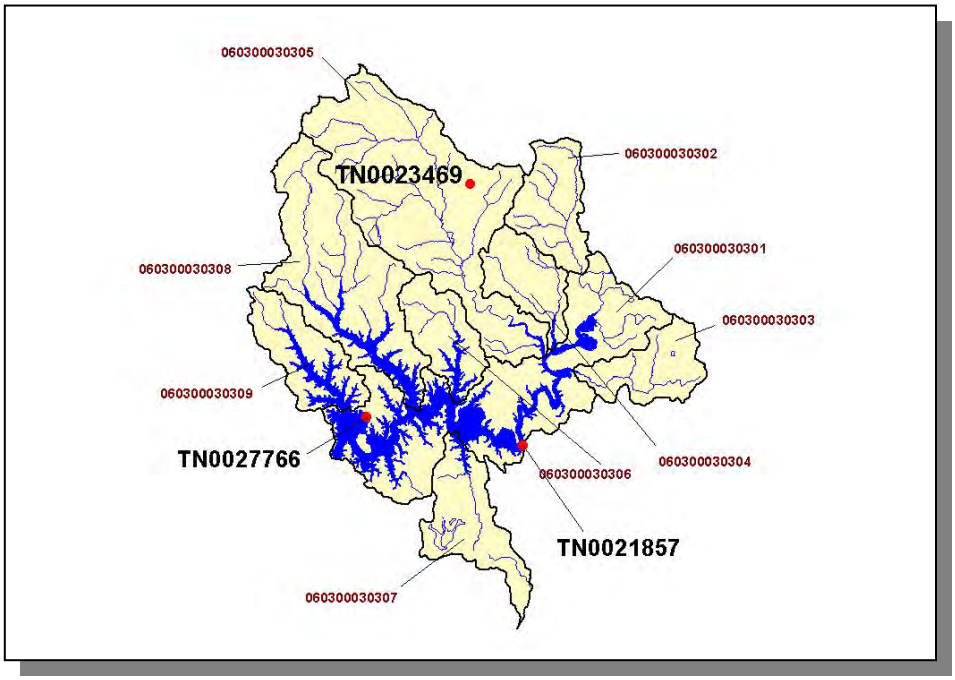


Figure 4-32. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

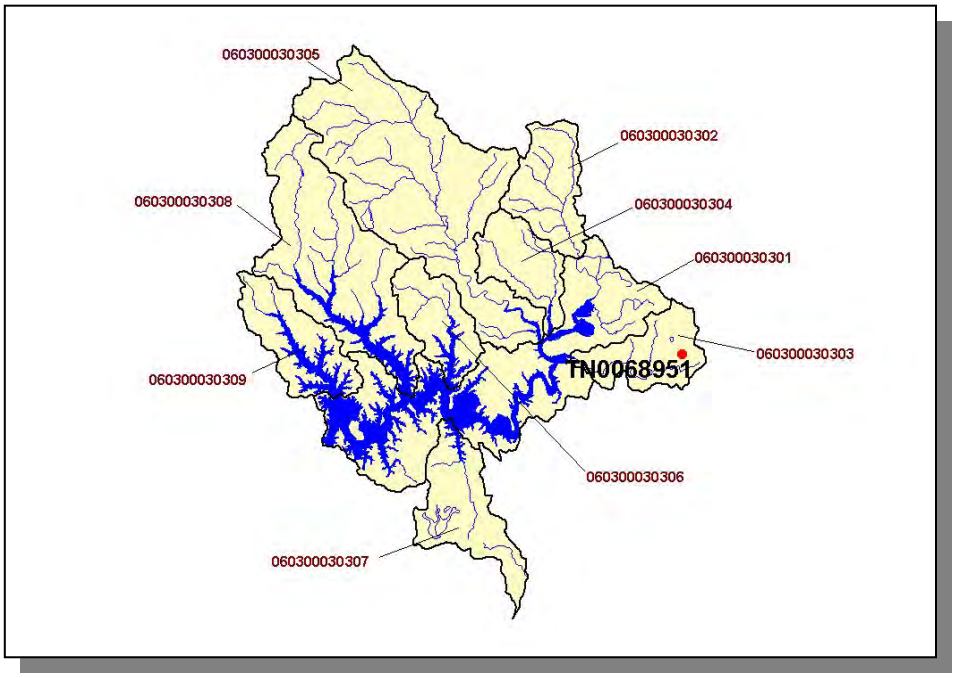


Figure 4-33. Location of Active Mining Sites in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

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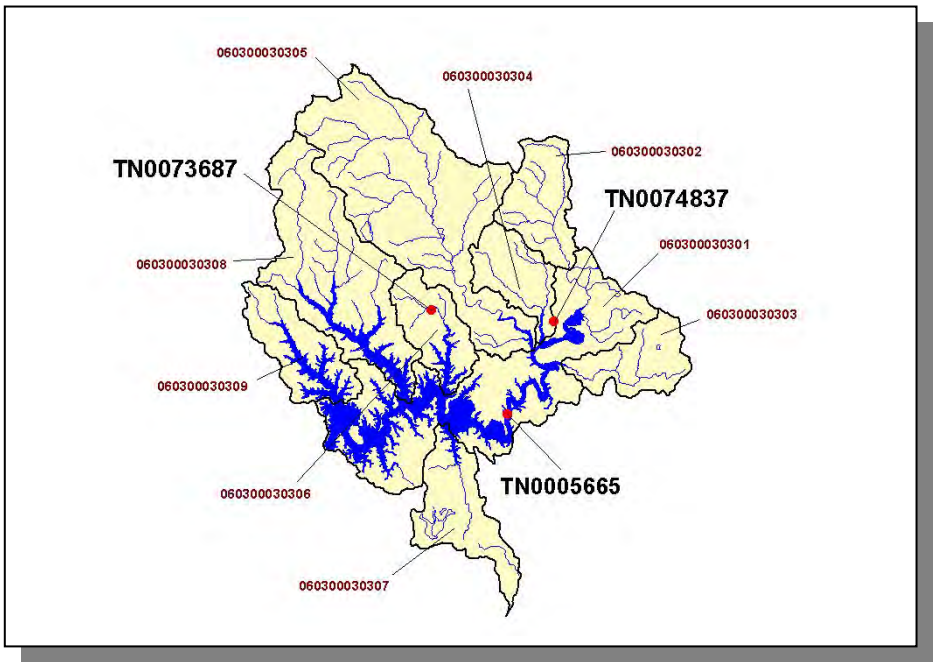

Figure 4-34. Location of Water Treatment Plant Sites in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

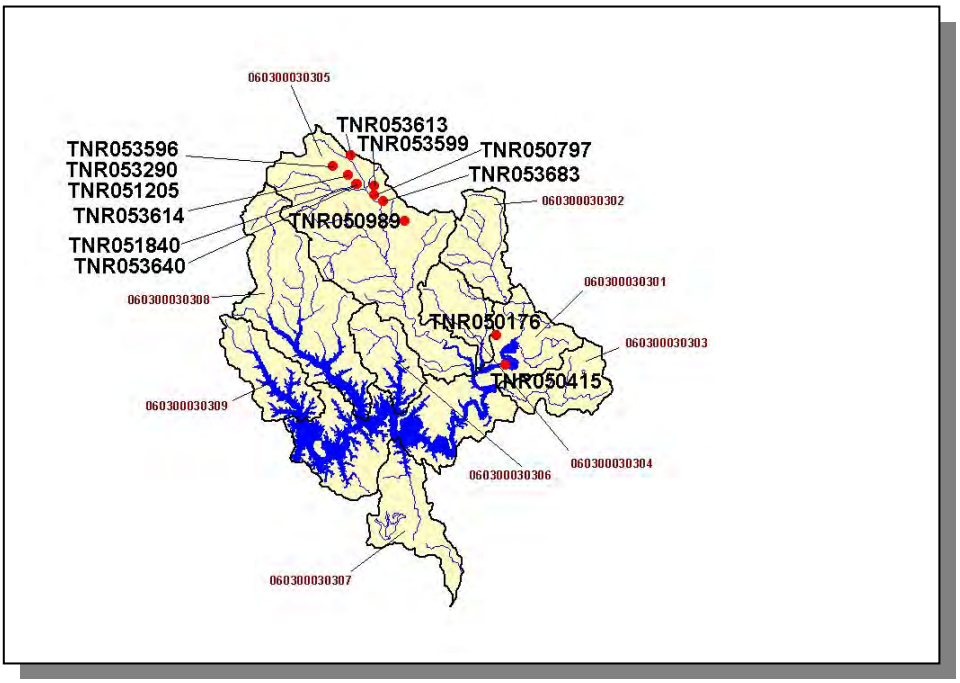

Figure 4-35. Location of TMSP Facilities in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

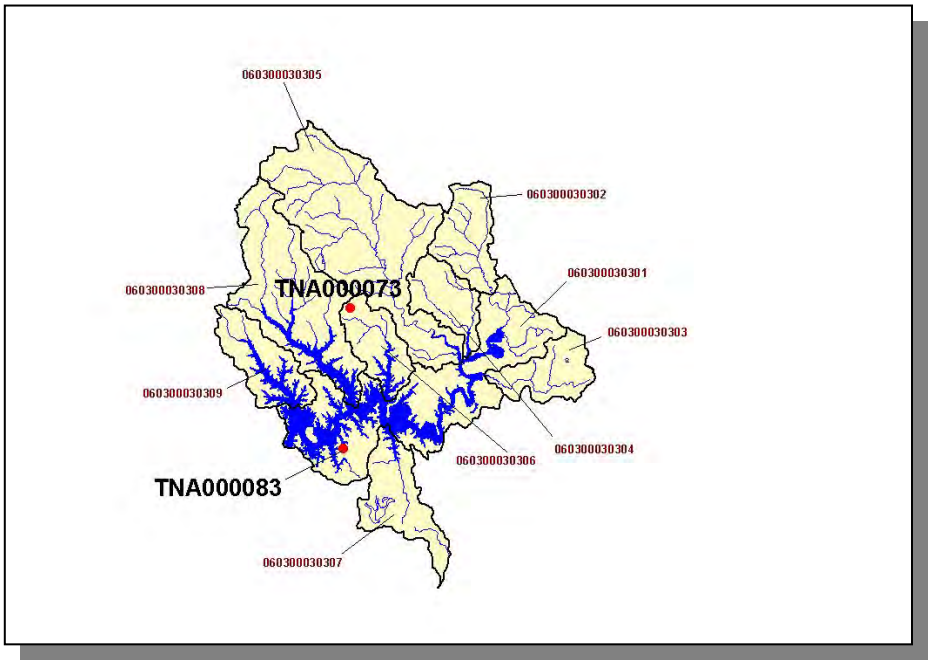

Figure 4-36. Location of CAFO Facilities in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. CAFO rules may be found at http://cfpub.epa.gov/npdes/afo/cafofinalrule.cfm. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

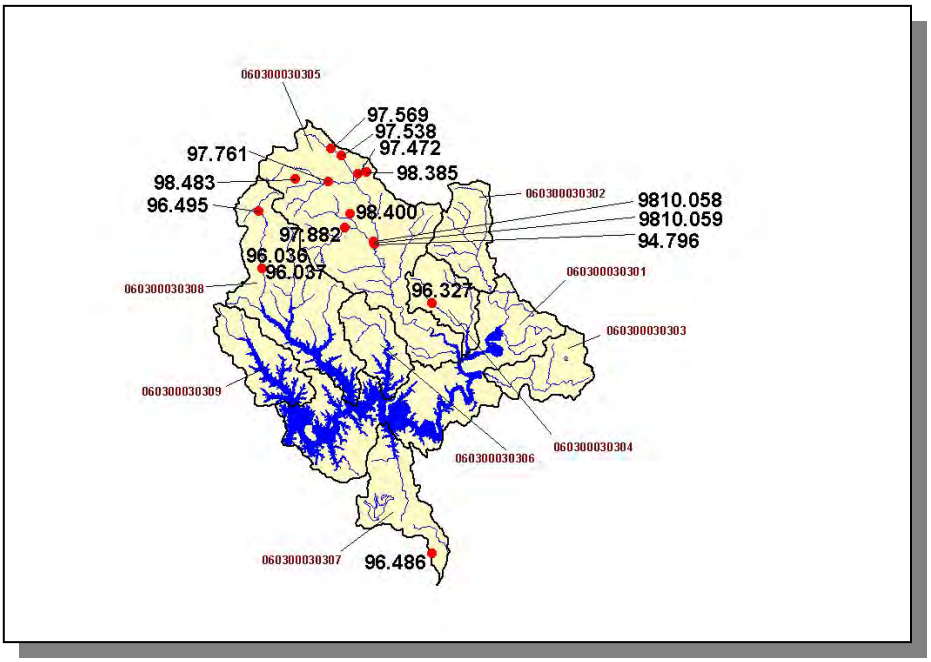

Figure 4-37. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000303. *Subwatershed 060300030301, 060300030302, 060300030303, 060300030304, 060300030305, 060300030306, 060300030307, 060300030308, and 060300030309 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

4.2.C.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
5,293	11,552	1,033	12	2,849,062	5,729	44

Table 4-19. Summary of Livestock Count Estimates in Subwatershed 0603000303. *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)
Coffee	114.4	114.2	2.8	12.7
Franklin	183.4	183.0	6.0	28.7
Moore	36.6	36.6	0.0	0.0
Totals	334.4	333.8	8.8	41.4

Table 4-20. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0603000303.

CROPS	TONS/ACRE/YEAR
Corn (Row Crops)	5.56
Soybeans (Row Crops)	4.76
Cotton (Row Crops)	4.03
Legume (Hayland)	1.35
Grass (Pastureland)	0.75
Grass, Forbs, Legumes (Mixed Pasture)	0.83
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Wheat (Close Grown Cropland)	6.14
All Other Close Grown Cropland	5.82
Other Vegetable and Truck Crop	4.37
Other (Horticultural)	1.92
Conservation Reserve Program Land	0.09
Farmsteads and Ranch Headquarters	0.13
Other Cropland not Planted	2.37
Nonagricultural Land Use	0.00

Table 4-21. Annual Estimated Total Soil Loss in Subwatershed 0603000303.

4.2.D. 0603000304.

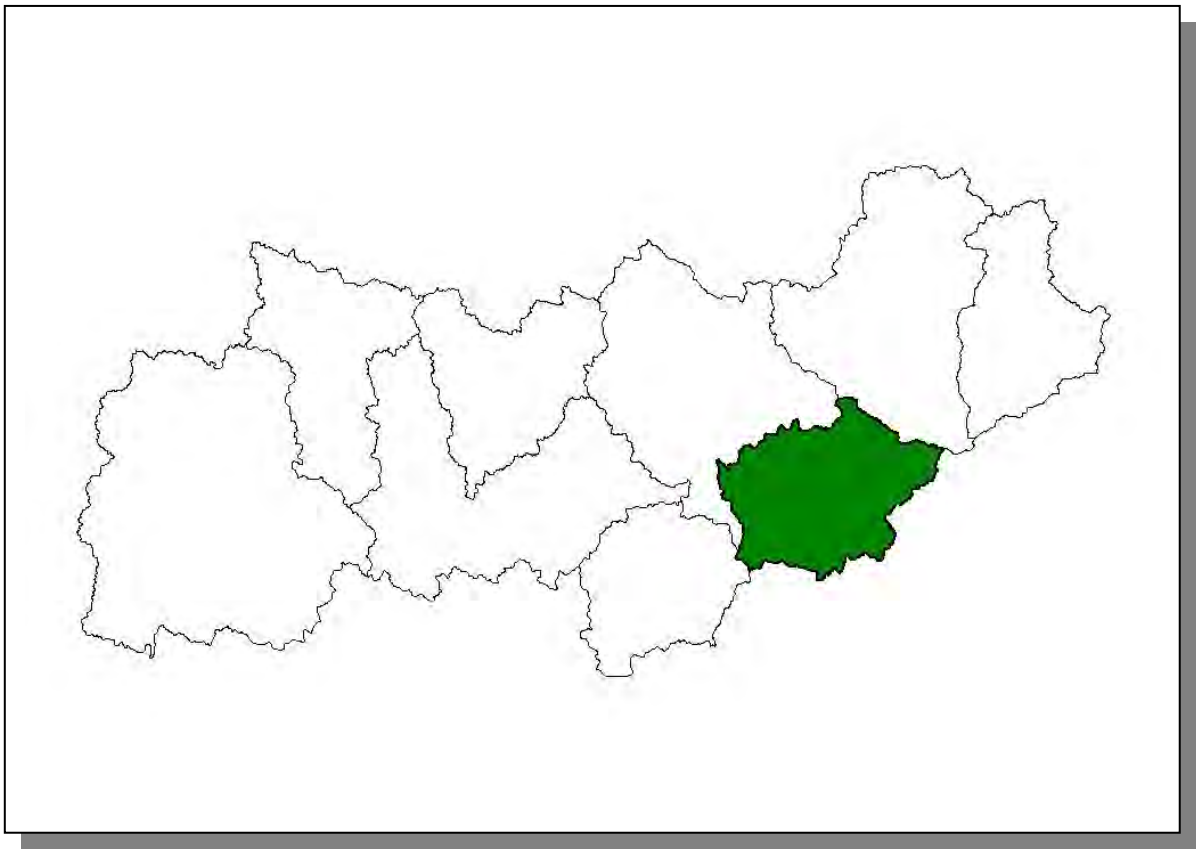

Figure 4-38. Location of Subwatershed 0603000304. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.D.i. General Description.

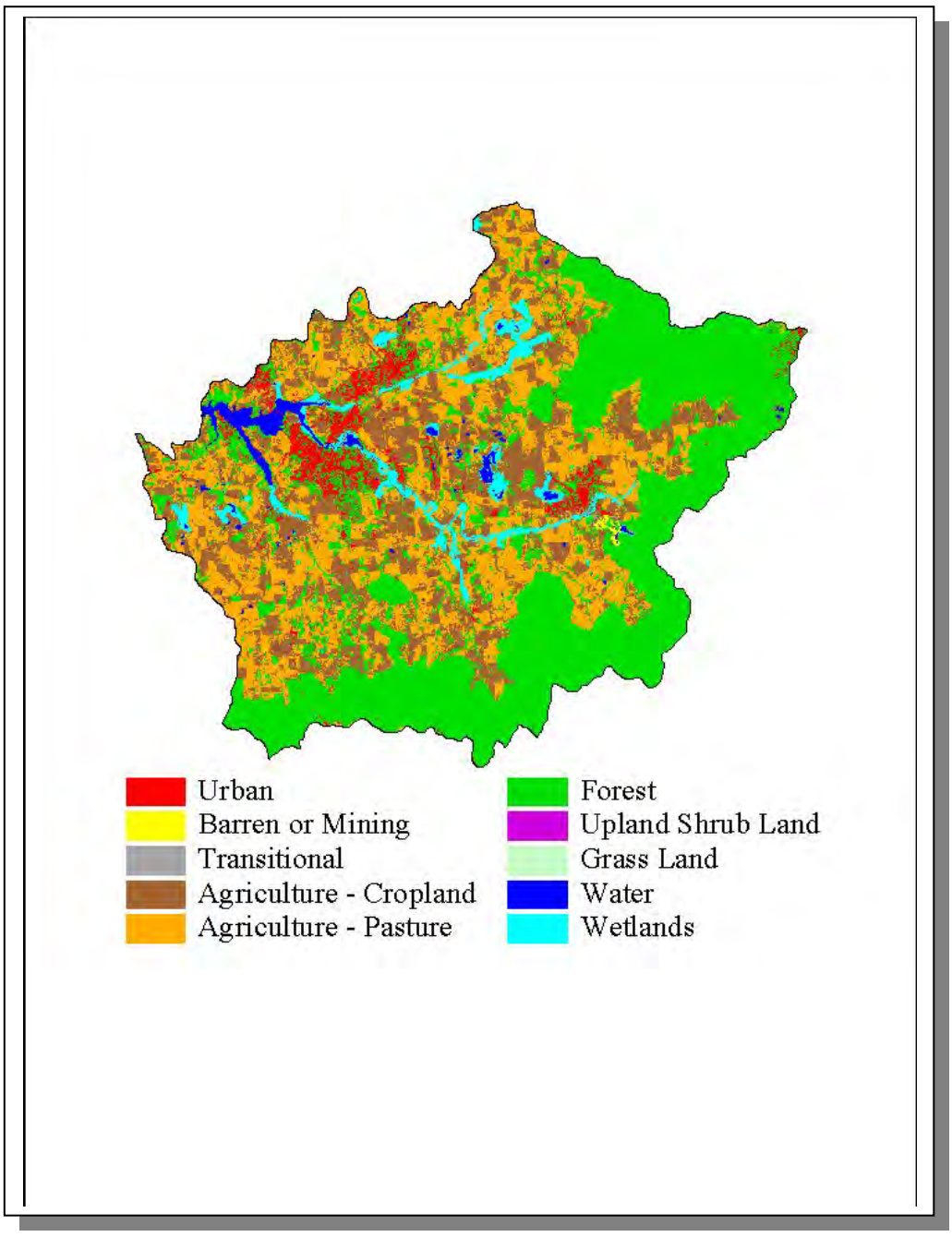

Figure 4-39. Illustration of Land Use Distribution in Subwatershed 0603000304.

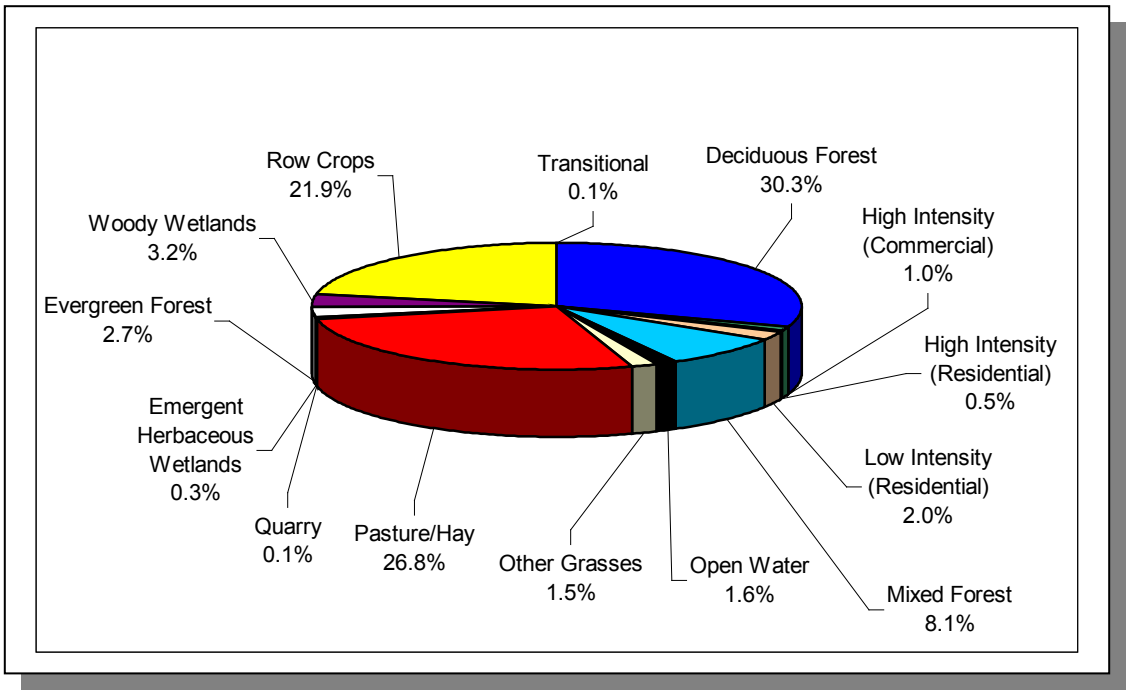

Figure 4-40. Land Use Distribution in Subwatershed 0603000304. *More information is provided in Upper Elk-Appendix IV.*

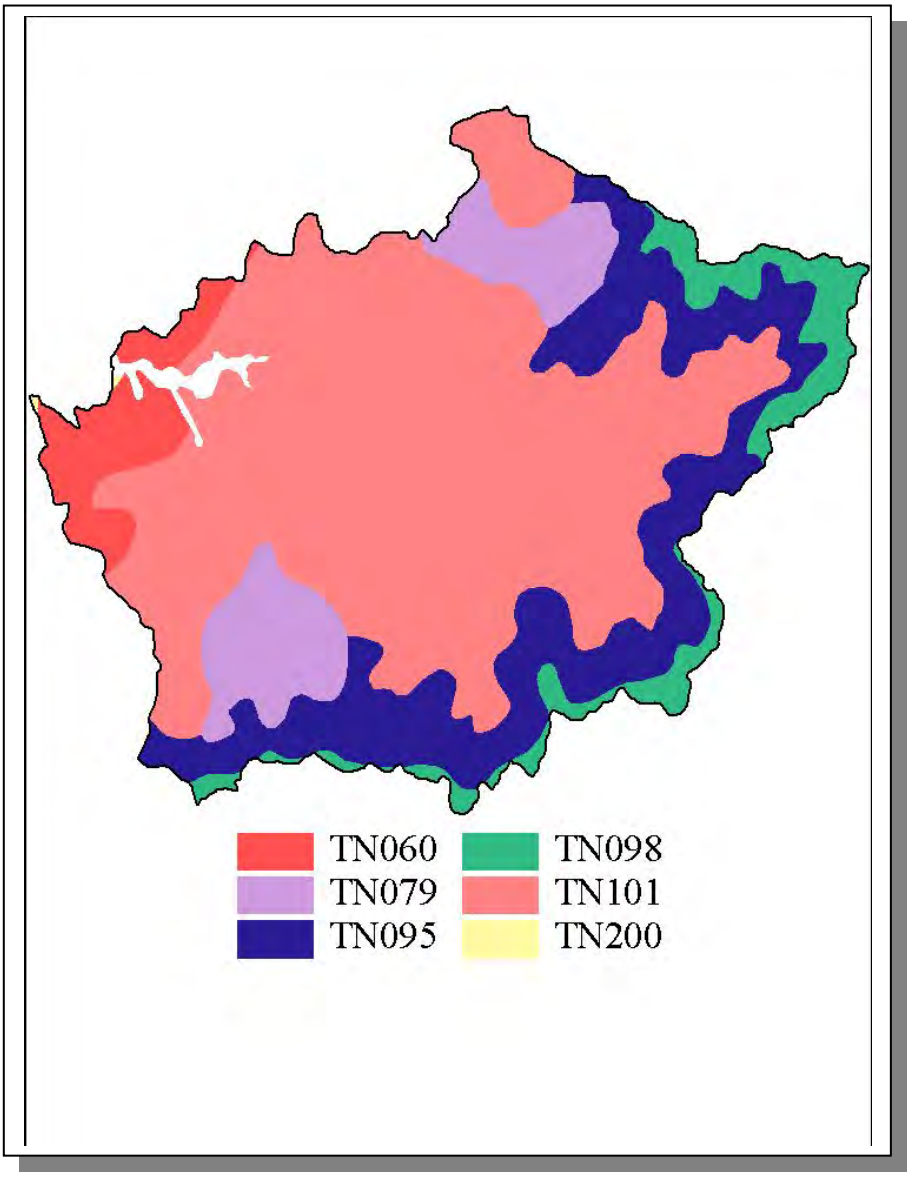

Figure 4-41. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000304.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN079	8.00	C	1.30	5.66	Silty Loam	0.35
TN095	0.00	B	2.35	5.12	Loam	0.31
TN098	1.00	C	3,98	4.82	Loam	0.32
TN101	0.00	B	1.71	5.39	Loam	0.35
TN200	1.00	B	2.81	5.28	Loam	0.31

Table 4-22. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000304. *More information is provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		% CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Franklin	34,725	37,152	18.63	6,470	6,922	7.0

Table 4-23. Population Estimates in Subwatershed 0603000304.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Cowan	Franklin	1,738	728	701	27	0
Decherd	Franklin	2,296	913	867	46	0
Winchester	Franklin	6,305	2,625	2,318	307	0
Total		**10,339**	**4,266**	**3,886**	**380**	**0**

Table 4-24. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0603000304.

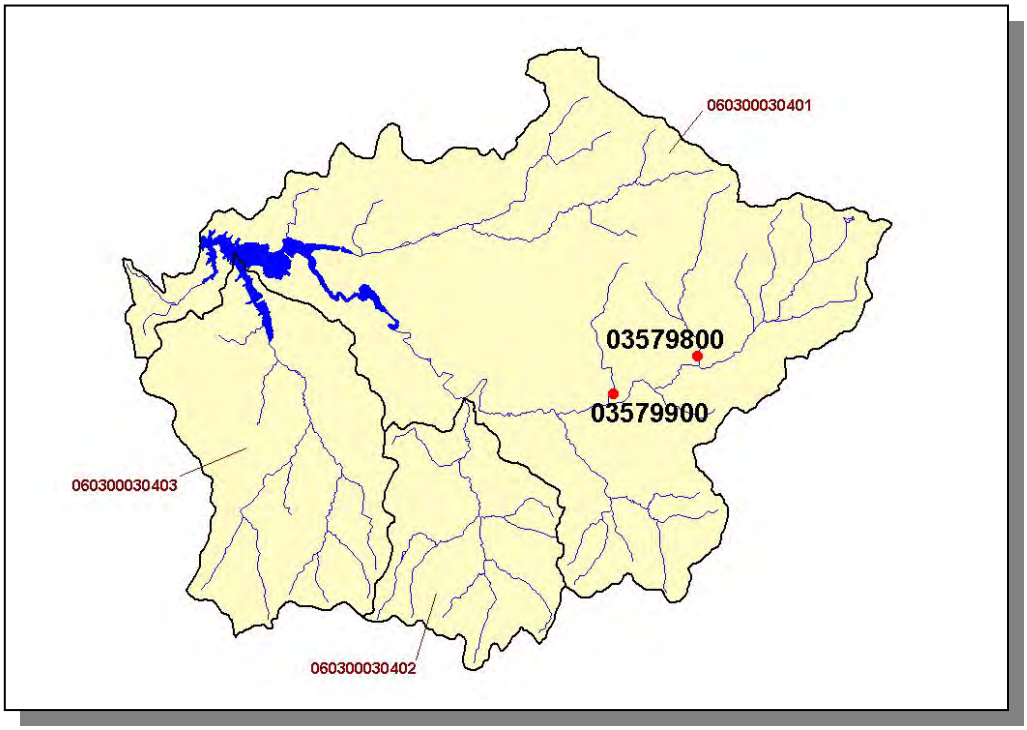

Figure 4-42. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000304. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

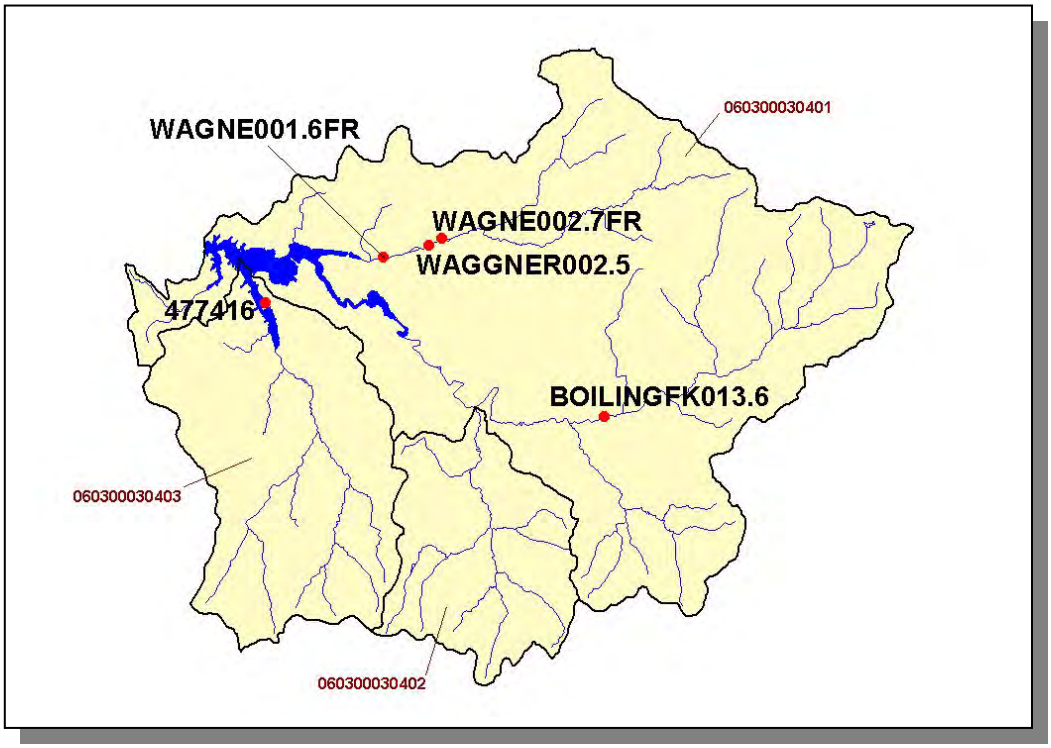

Figure 4-43. Location of STORET Monitoring Sites in Subwatershed 0603000304. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.D.ii. Point Source Contributions.

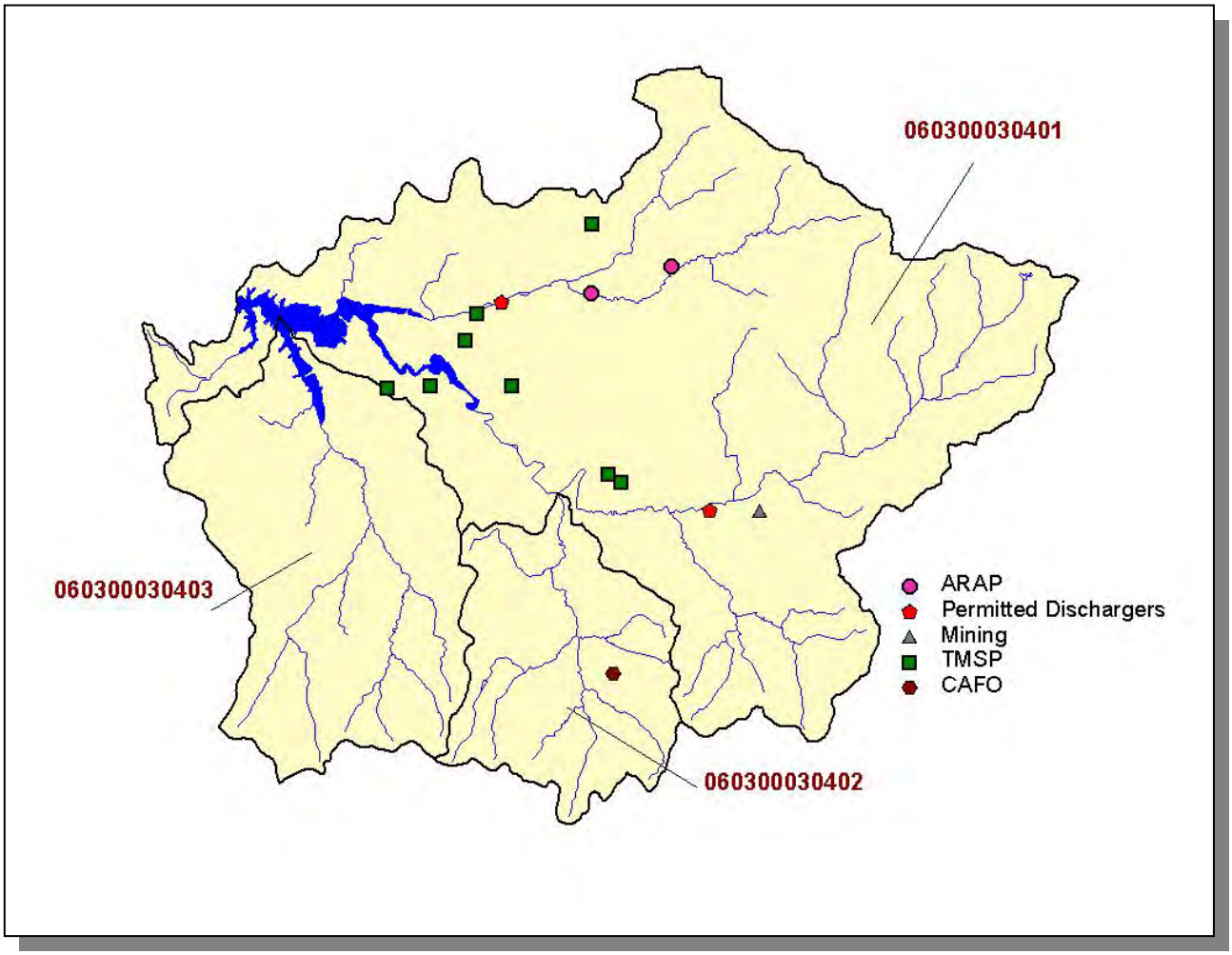

Figure 4-44. Location of Active Point Source Facilities in Subwatershed 0603000304. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. More information is provided in the following charts.*

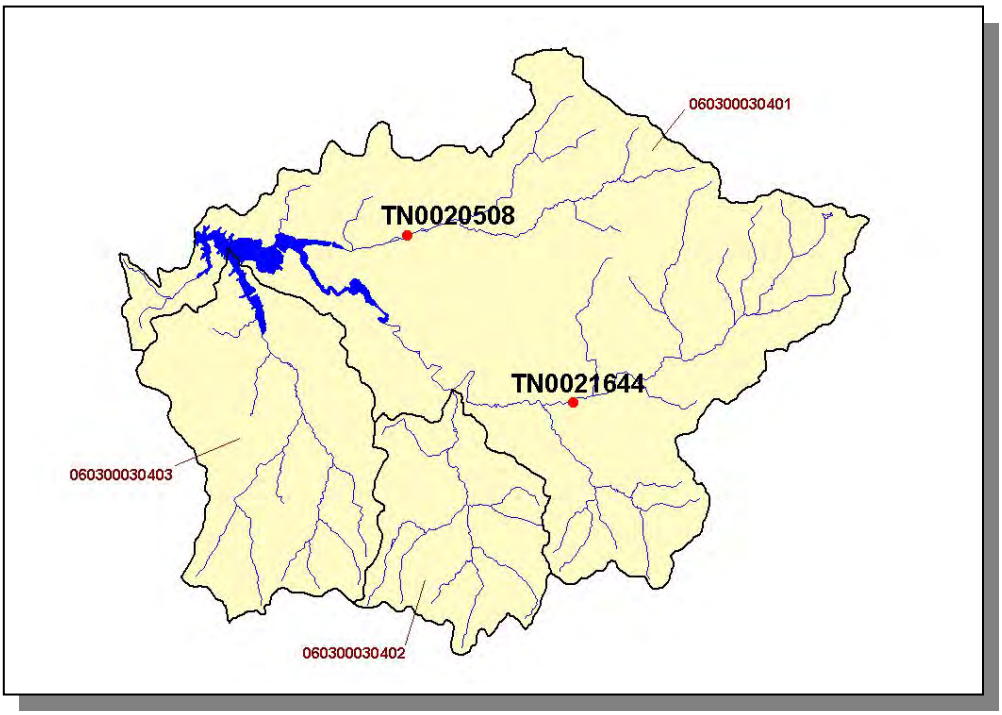

Table 4-25. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0603000304. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

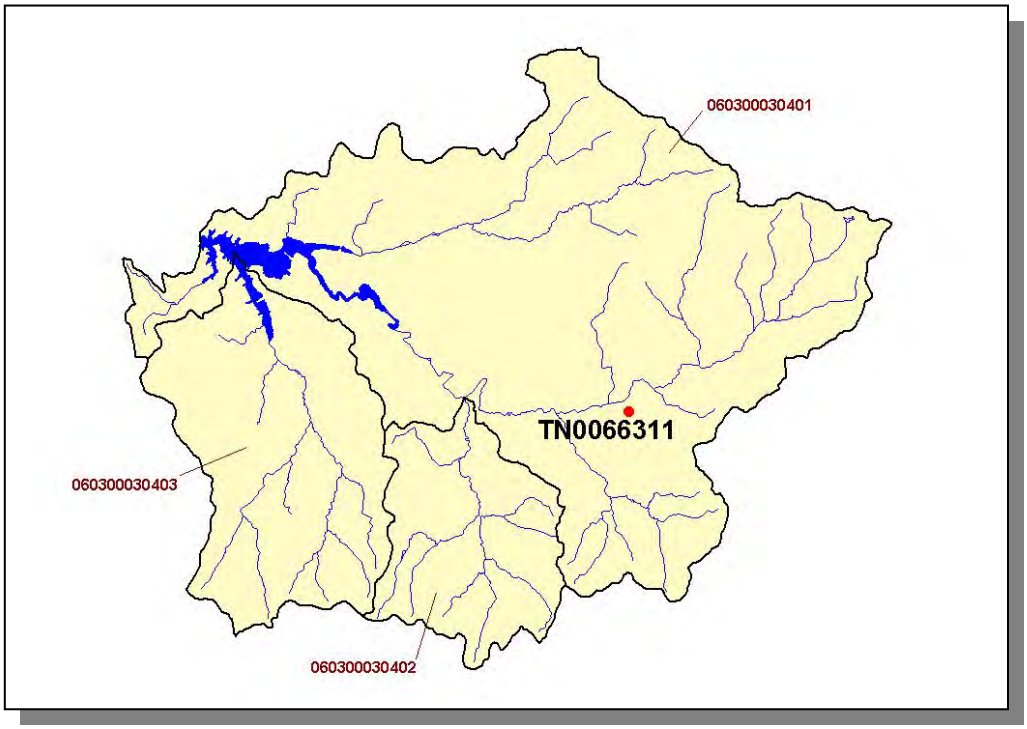

Figure 4-45. Location of Active Mining Sites in Subwatershed 0602000206. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

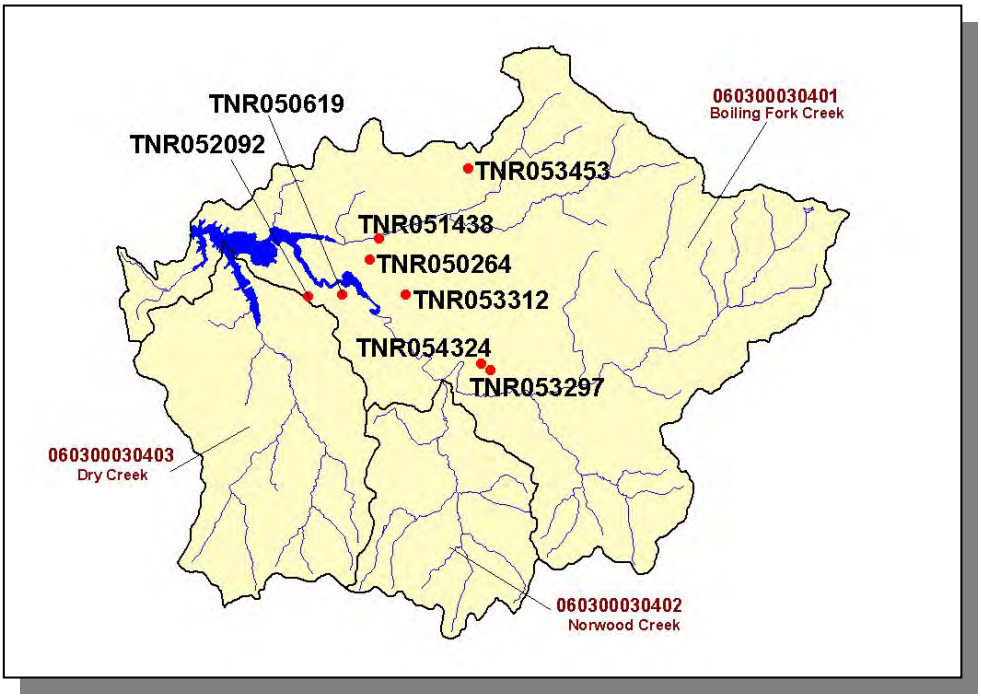

Figure 4-46. Location of TMSP Facilities in Subwatershed 0603000304. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

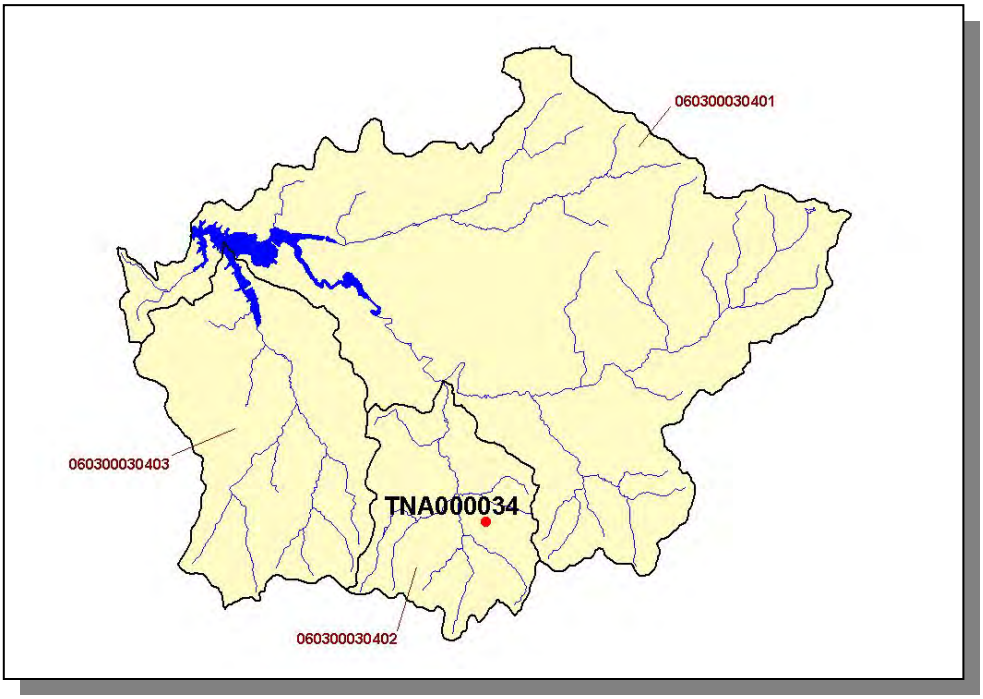

Figure 4-47. Location of CAFO Facilities in Subwatershed 0603000304. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. CAFO rules may be found at http://cfpub.epa.gov/npdes/afo/cafofinalrule.cfm. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

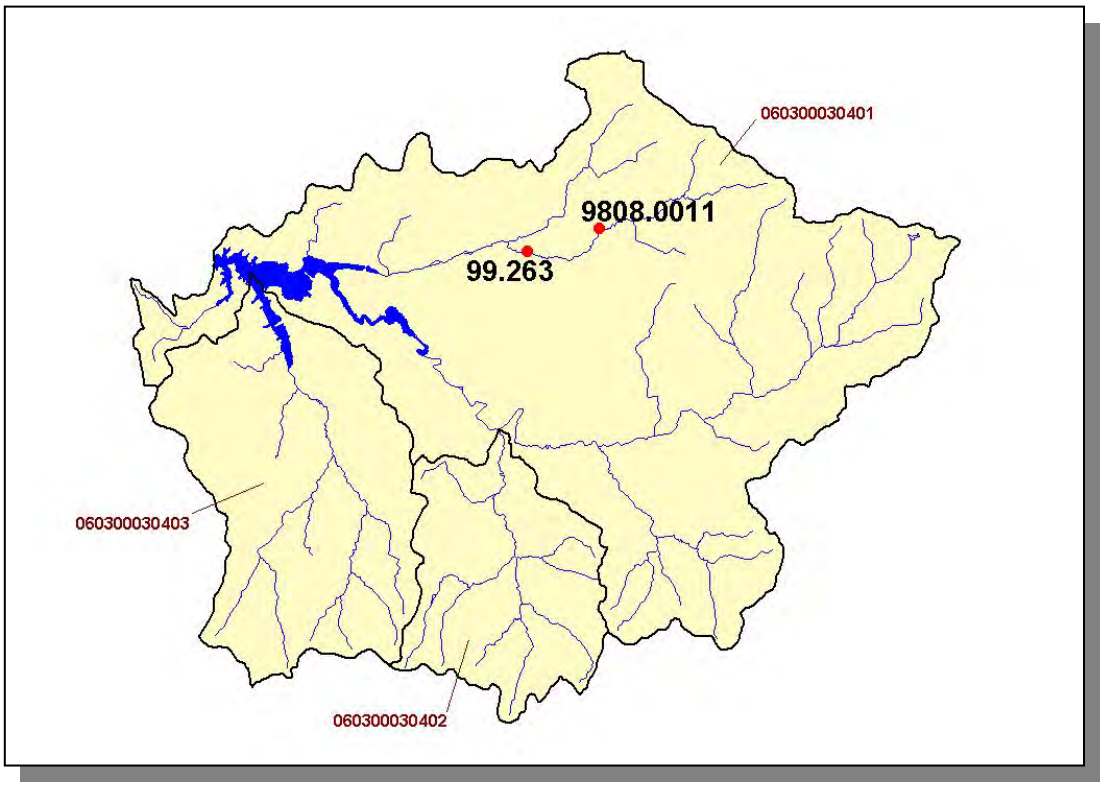

Figure 4-48. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000304. *Subwatershed 060300030401, 060300030402, and 060300030403 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.D.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Milk Cow	Cattle	Chickens	Chickens Sold	Hogs	Sheep
3,928	849	8,690	8	2,325,343	5,472	30

Table 4-26. Summary of Livestock Count Estimates in Subwatershed 0603000304. *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)
Franklin	183.4	183.0	6.0	28.7

Table 4-27. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0603000304.

CROPS	TONS/ACRE/YEAR
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Corn (Row Crops)	5.57
Soybeans (Row Crops)	3.88
Wheat (Close Grown Cropland)	5.55
All Other Close Grown Cropland	5.82
Legume (Hayland)	1.64
Grass (Pastureland)	0.32
Grass, Forbs, Legumes (Mixed Pasture)	0.52
Conservation Reserve Program Land	0.09
Other (Horticulture)	1.92
Other Cropland not Planted	2.04
Non Agricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.13

Table 4-28. Annual Soil Loss in Subwatershed 0603000304.

4.2.E. 0603000305.

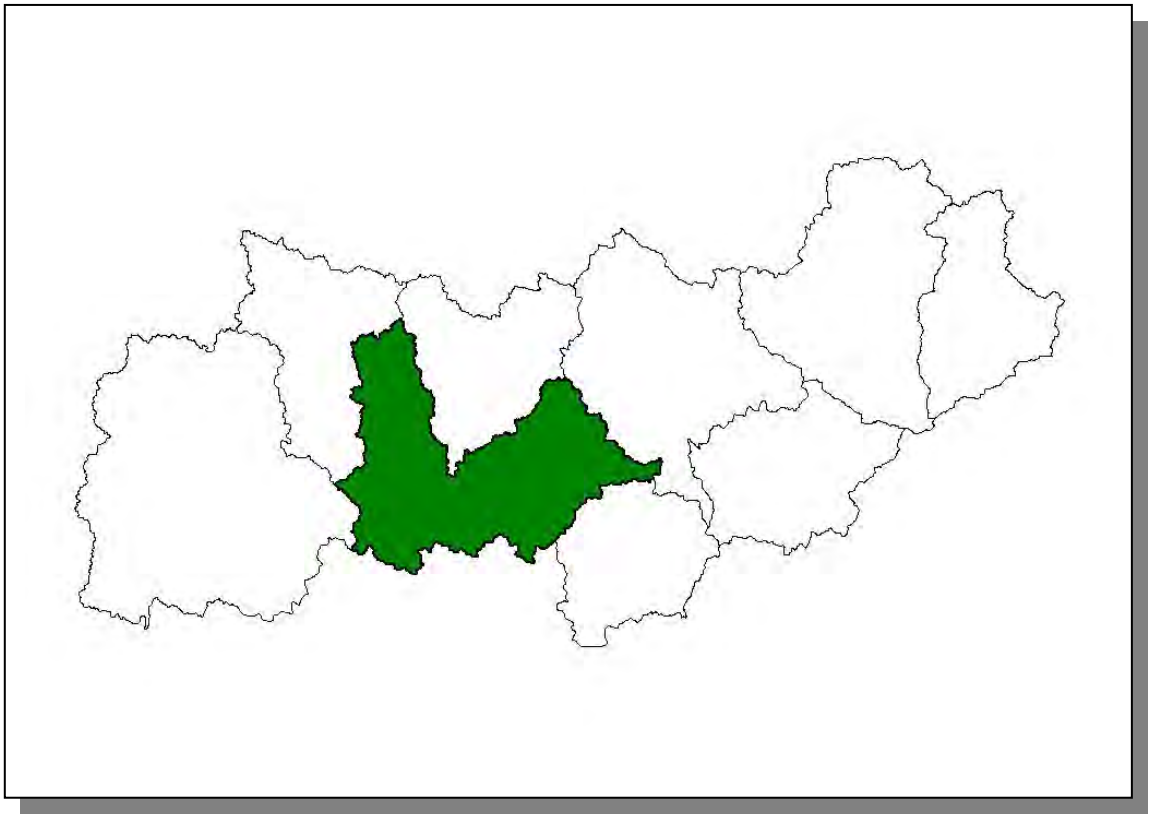

Figure 4-49. Location of Subwatershed 0603000305. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.E.i. General Description.

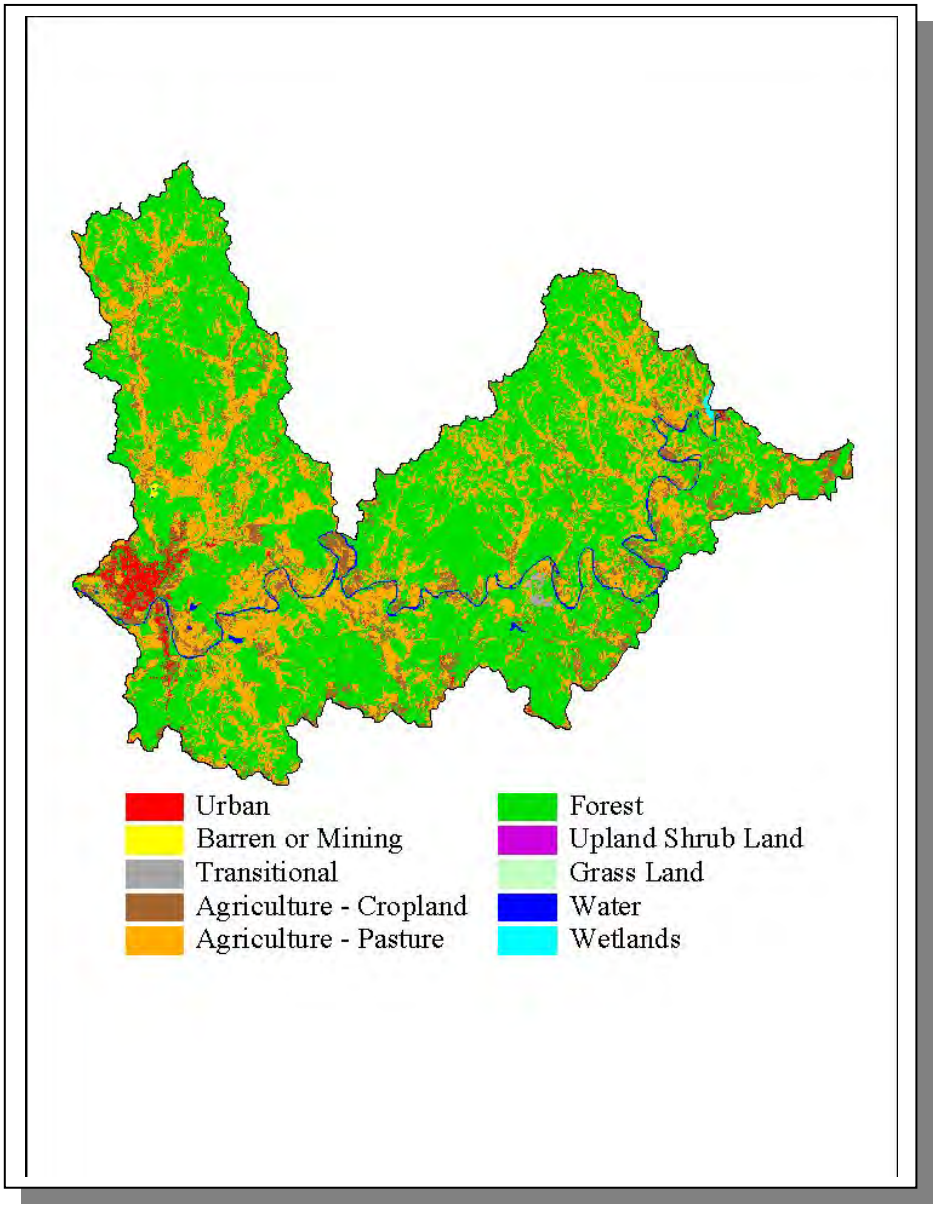

Figure 4-50. Illustration of Land Use Distribution in Subwatershed 0603000305.

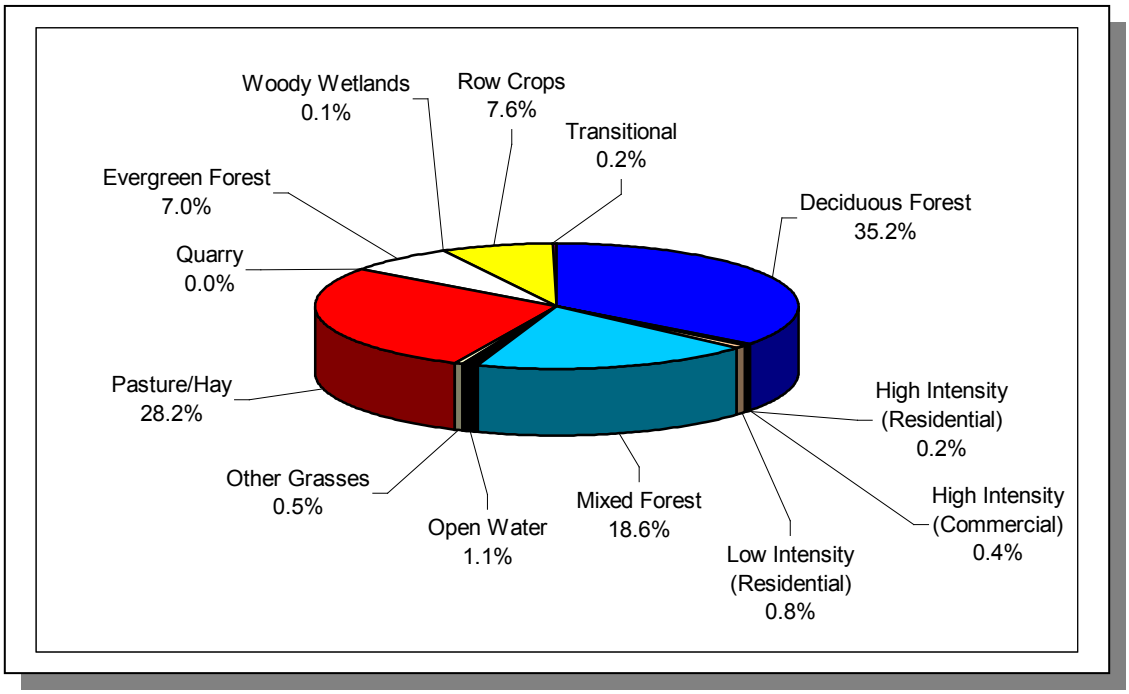

Figure 4-51. Land Use Distribution in Subwatershed 0603000305. *More information is provided in Upper Elk-Appendix IV.*

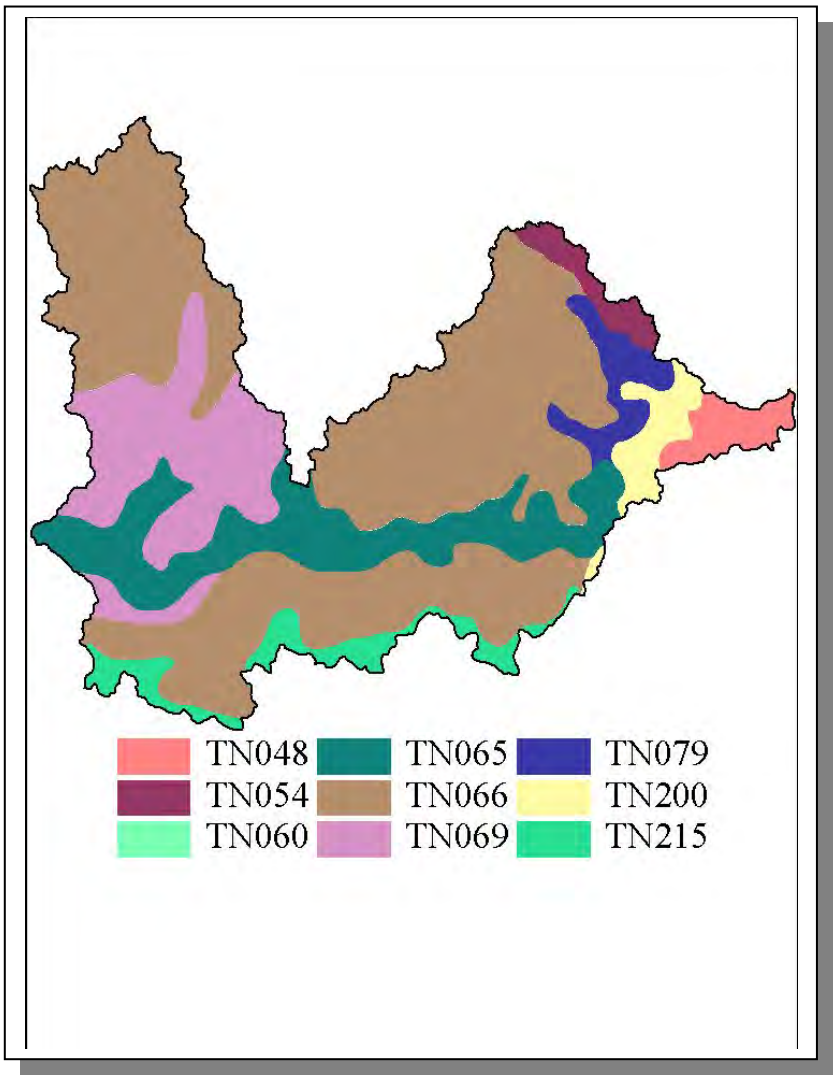

Figure 4-52. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000305.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN048	8.00	C	1.38	5.06	Silty Loam	0.42
TN054	0.00	C	3.04	4.84	Loam	0.32
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN065	0.00	C	1.15	5.52	Loam	0.32
TN066	0.00	B	2.62	4.75	Loam	0.28
TN069	0.00	C	2.06	5.36	Loam	0.34
TN079	8.00	C	1.30	5.66	Silty Loam	0.35
TN200	1.00	B	2.81	5.28	Loam	0.31
TN215	9.00	C	1.57	5.02	Silty Loam	0.39

Table 4-29. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000305. *More information is provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Franklin	34,725	37,152	2.31	801	857	7.0
Lincoln	28,157	29,336	23.5	6,617	6,894	4.2
Moore	4,721	5,205	22.78	1,076	1,186	10.2
Total	**67,603**	**71,693**		**8,494**	**8,937**	**5.2**

Table 4-30. Population Estimates in Subwatershed 0603000305.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Fayetteville	Lincoln	6,921	3,277	3,168	99	10

Table 4-31. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0603000305.

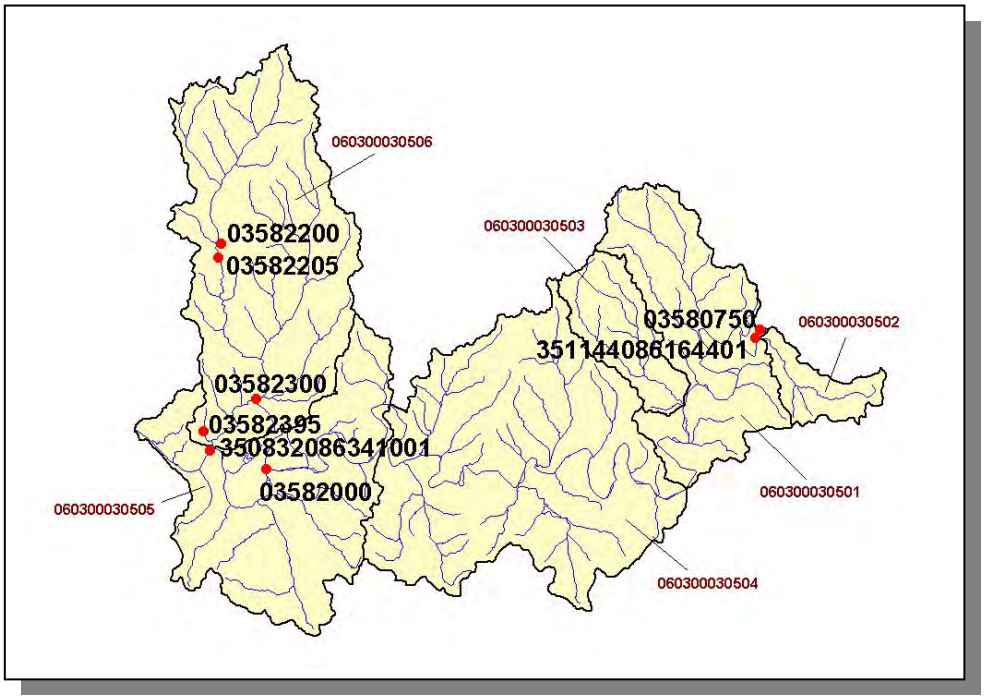

Figure 4-53. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

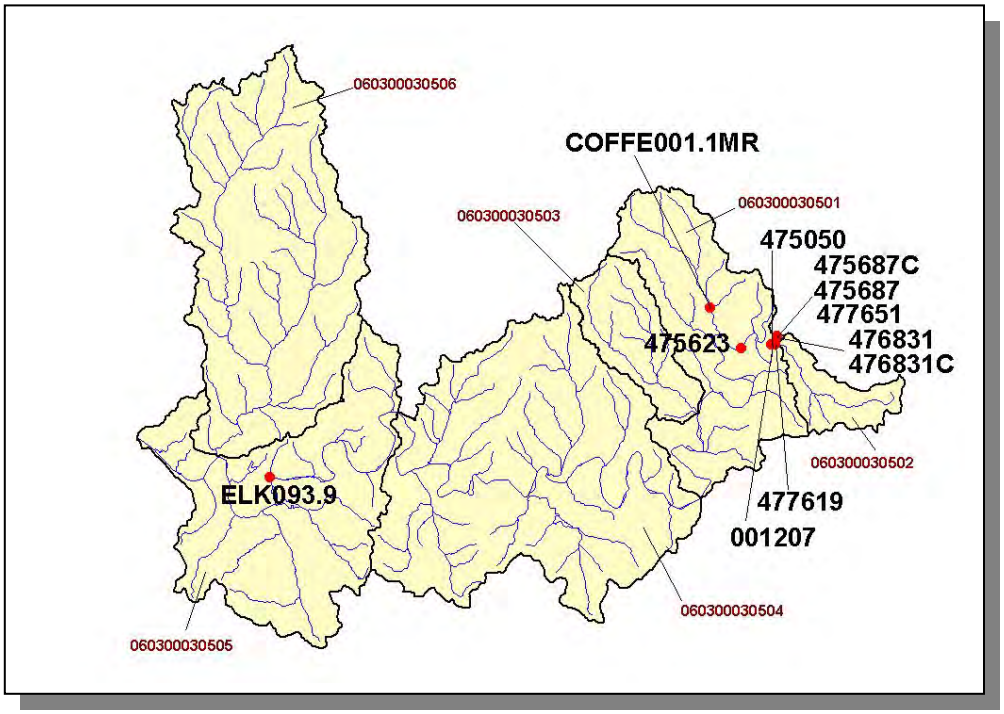

Figure 4-54. Location of STORET Monitoring Sites in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.E.ii. Point Source Contributions.

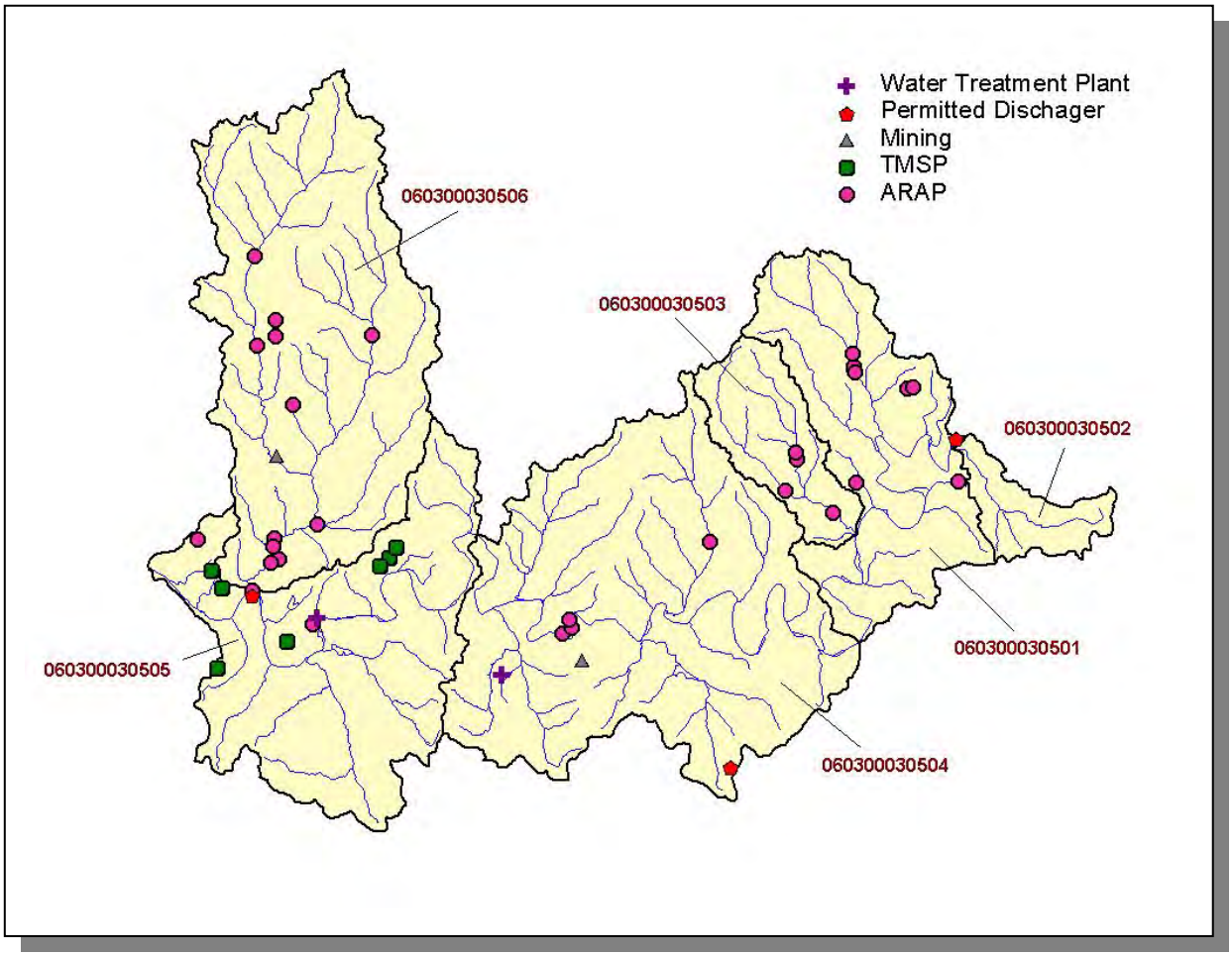

Figure 4-55. Location of Active Point Source Facilities in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in the following charts.*

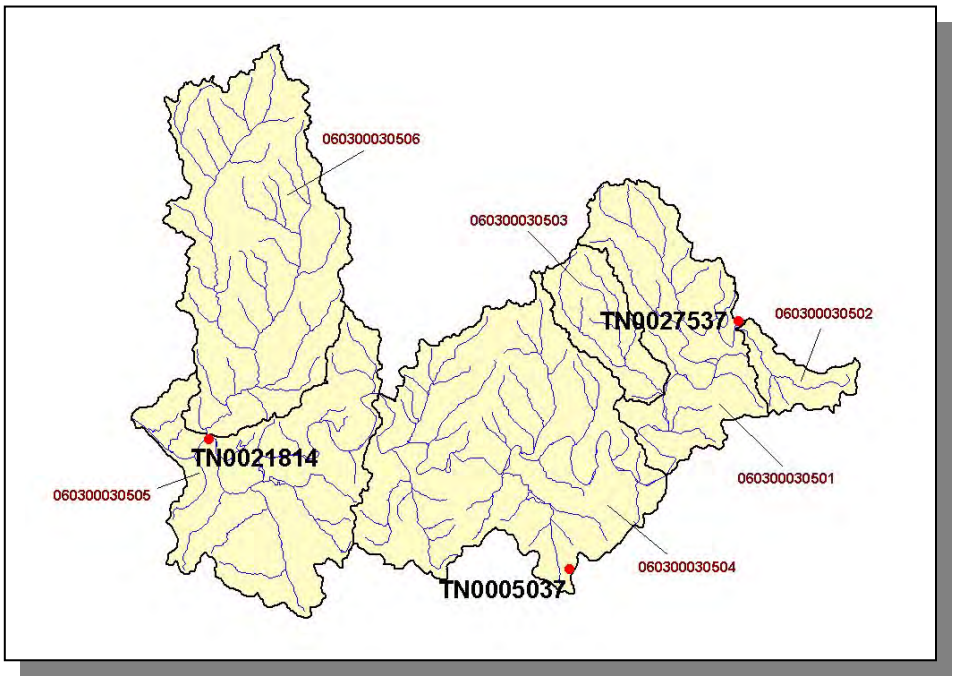

Figure 4-56. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

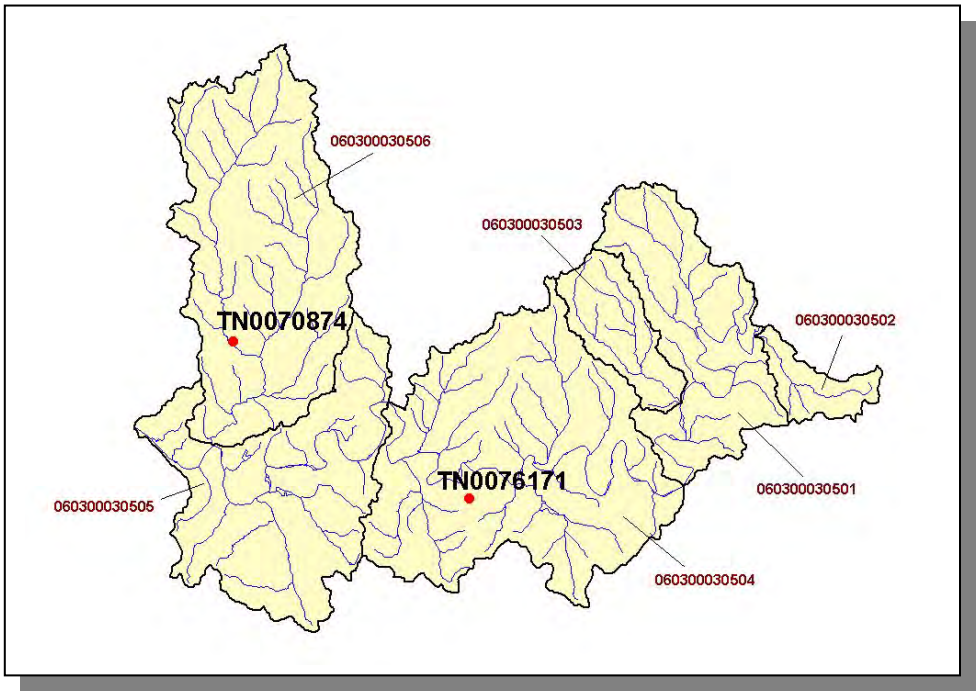

Figure 4-57. Location of Active Mining Sites in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

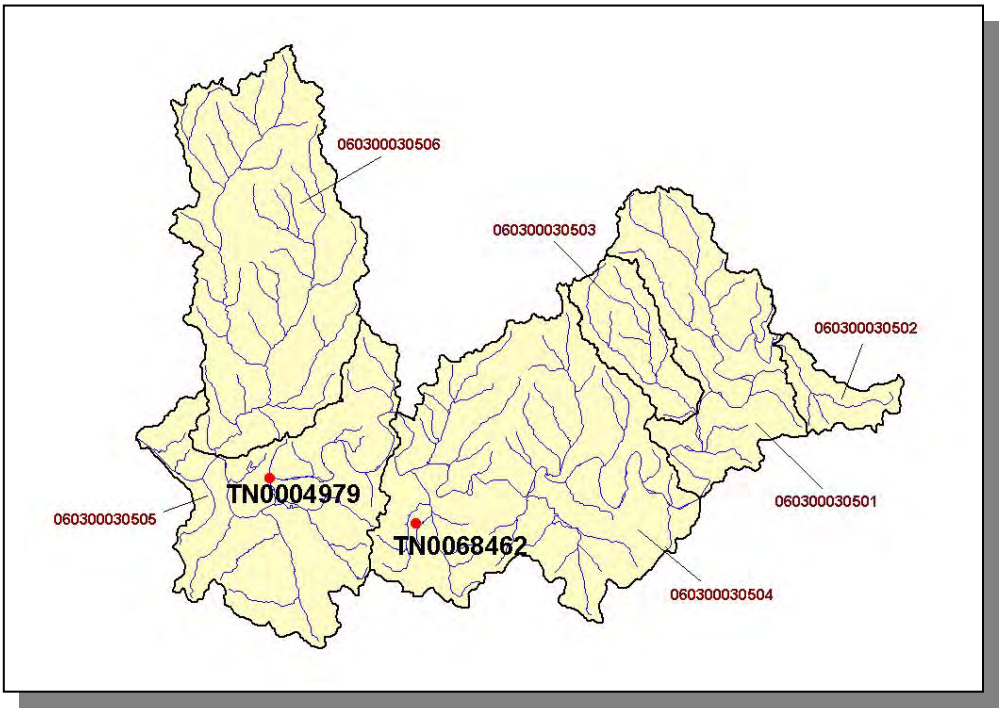

Figure 4-58. Location of Water Treatment Plant Sites in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

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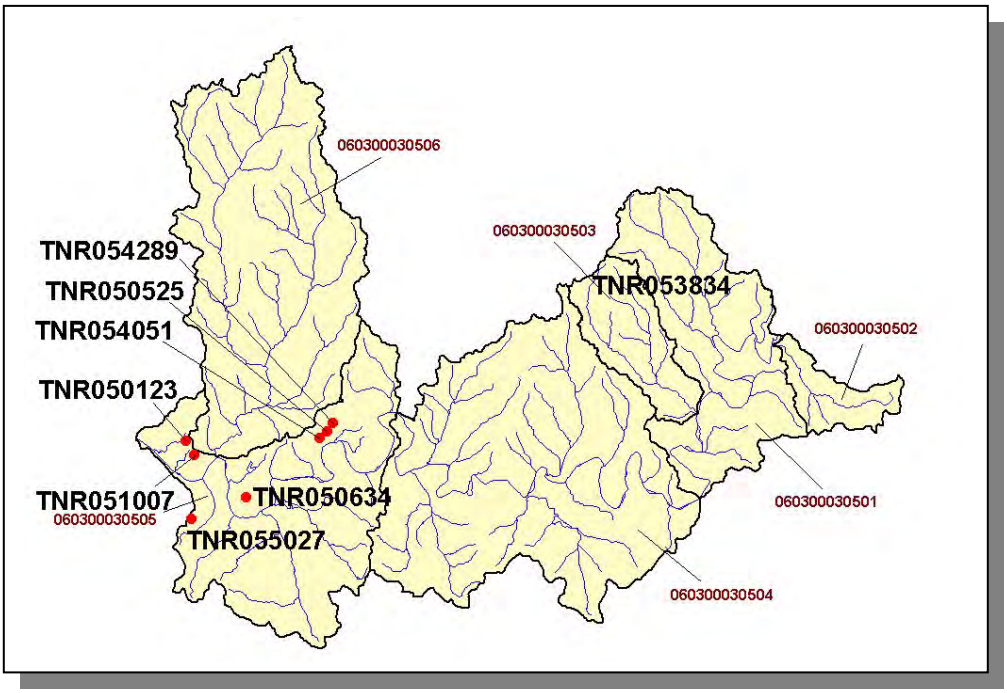

Figure 4-59. Location of TMSP Facilities in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

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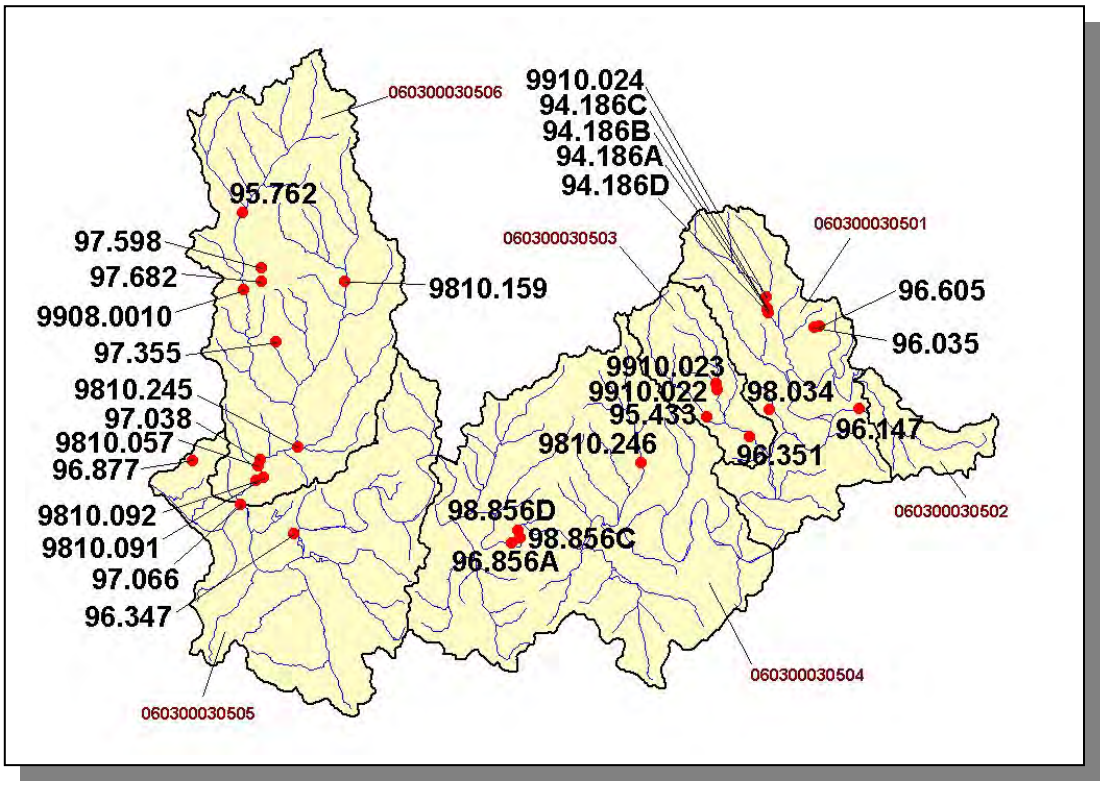

Figure 4-60. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

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

There is one NPDES facility discharging to water bodies listed on the 1998 303(d) list in Subwatershed 0603000305:

- TN0027537 (TVA Tim's Ford Hydro Plant) discharges to Elk River @ RM 133.3

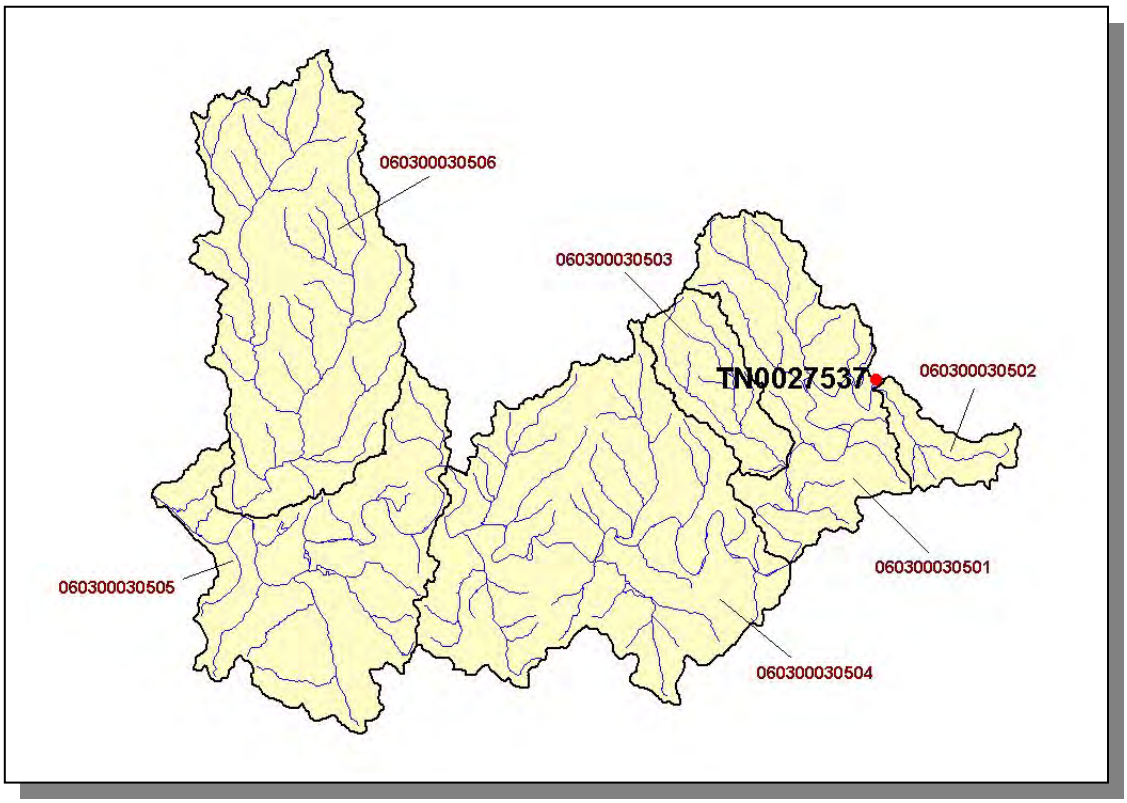

Figure 4-61. Location of NPDES Dischargers to Water Bodies Listed on the 1998 303(d) List in Subwatershed 0603000305. *Subwatershed 060300030501, 060300030502, 060300030503, 060300030504, 060300030505, and 060300030506 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

PERMIT #	1Q10	3Q10	7Q10	3Q20	QDESIGN
TN0027537					Varies by Outfall

Table 4-32. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies. **Listed on the 1998 303(d) List in Subwatershed 0603000305.**

PERMIT #	PCB	SETTLEABLE SOLIDS
TN0027537	X	X

Table 4-33. Parameters Monitored for Daily Maximum (mg/L) Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000302. *PCB, Polychlorinated Biphenyl.*

4.2.E.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Milk Cow	Cattle	Chickens	Chickens Sold	Hogs	Sheep
8,699	1,162	17,690	17	1,929,871	1,375	115

Table 4-34. Summary of Livestock Count Estimates in Subwatershed 0603000305. *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)
Franklin	183.4	183.0	6.0	28.7
Lincoln	136.7	136.7	1.1	3.2
Moore	36.6	36.6	0.0	0.0
Totals	**356.7**	**356.3**	**7.1**	**31.9**

Table 4-35. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 0603000305.

CROPS	TONS/ACRE/YEAR
Corn (Row Crops)	3.88
Soybeans (Row Crops)	6.92
Potatoes (Row Crops)	3.04
Tobacco (Row Crops)	9.27
Grass (Pastureland)	1.23
Grass, Forbs, Legumes (Mixed Pasture)	1.10
Grass (Hayland)	0.41
Legume (Hayland)	0.26
Legume/Grass (Hayland)	0.38
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Wheat (Close Grown Cropland)	3.48
Other Close Grown Cropland	5.82
Fruit (Horticultural)	0.09
Other (Horticulture)	1.92
Other Vegetable and Truck Crops	2.52
Other Land in Farms	0.28
Conservation Reserve Program Land	0.28
Other Cropland not Planted	2.04
Non Agricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.35

Table 4-36. Annual Estimated Soil Loss in Subwatershed 0603000305.

4.2.F. 0603000306

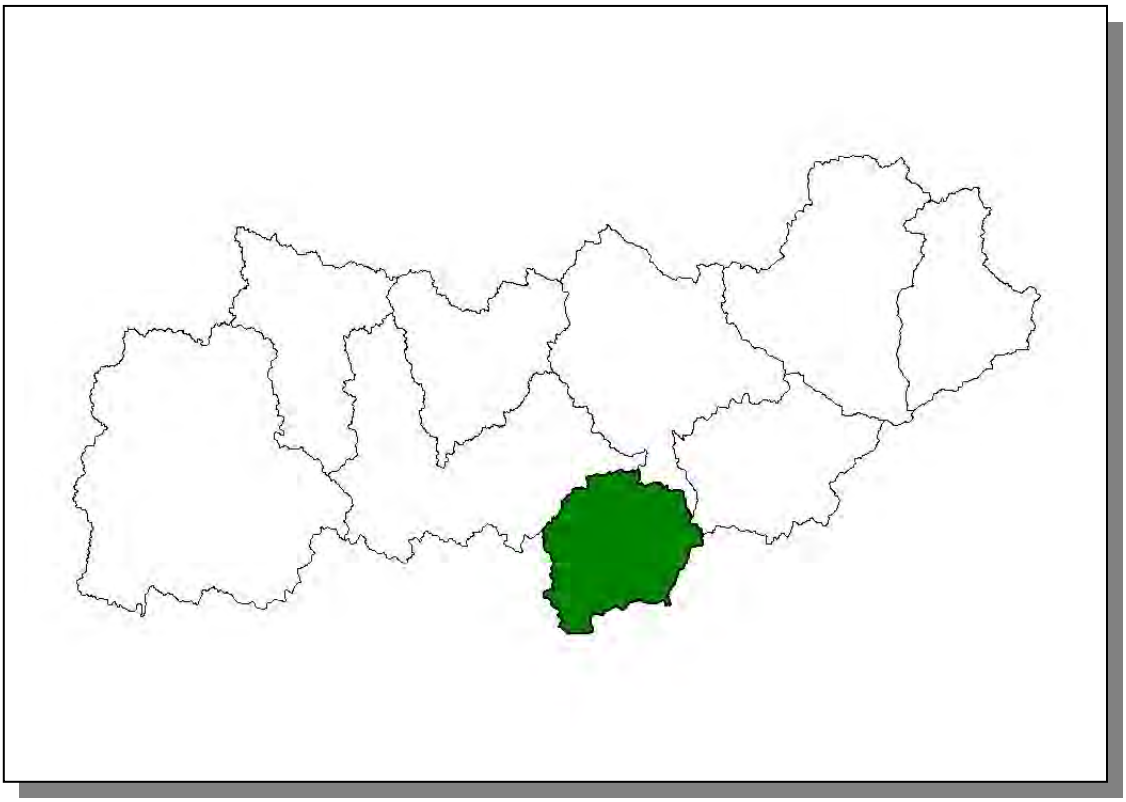

Figure 4-62. Location of Subwatershed 0603000306. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.F.i. General Description.

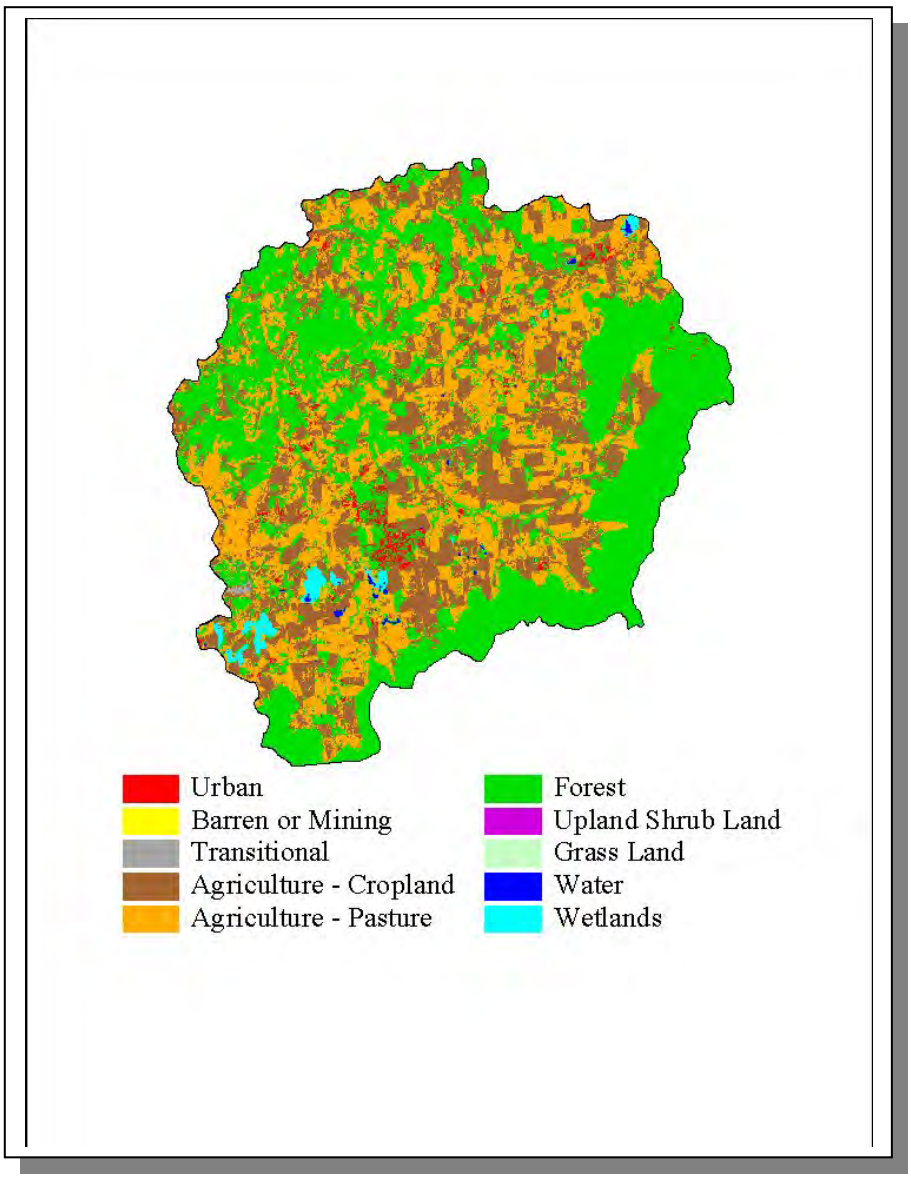

Figure 4-63. Illustration of Land Use Distribution in Subwatershed 0603000306.

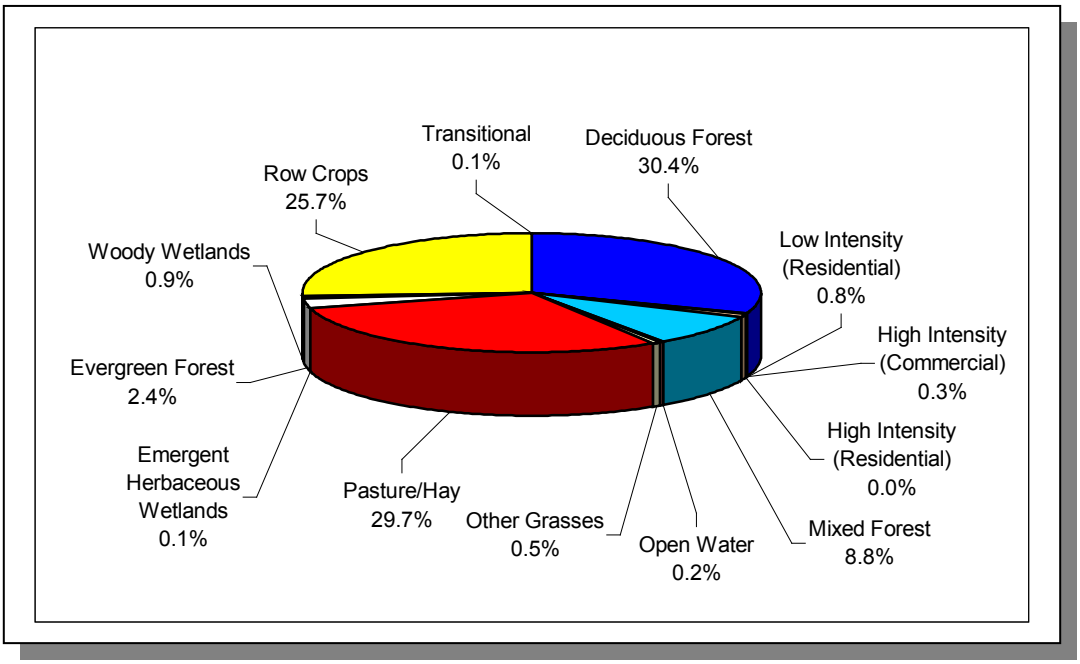

Figure 4-64. Land Use Distribution in Subwatershed 0603000306. *More information is provided in Upper Elk-Appendix IV.*

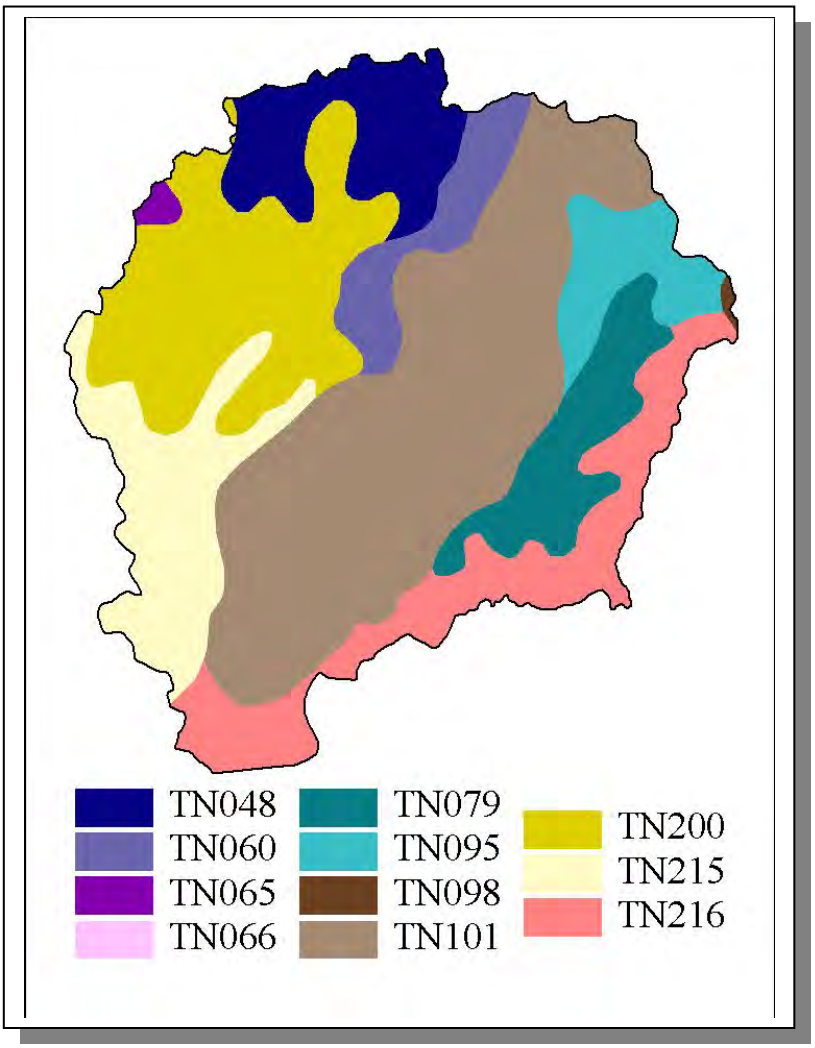

Figure 4-65. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000306.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN048	8.00	C	1.38	5.06	Silty Loam	0.42
TN060	5.00	B	1.30	5.32	Silty Loam	0.39
TN065	0.00	C	1.15	5.52	Loam	0.32
TN066	0.00	B	2.62	4.75	Loam	0.28
TN079	8.00	C	1.30	5.66	Silty Loam	0.35
TN095	0.00	B	2.35	5.12	Loam	0.31
TN098	1.00	C	3.98	4.82	Loam	0.32
TN101	0.00	B	1.71	5.39	Loam	0.35
TN200	1.00	B	2.81	5.28	Loam	0.31
TN215	9.00	C	1.57	5.02	Silty Loam	0.39
TN216	0.00	C	2.51	4.59	Loam	0.25

Table 4-37. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000306. *More information is provided in Upper Elk-Appendix IV.*

	TOTAL COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Franklin	34, 725	37,152	13.41	4,658	4,984	7.0
Lincoln	28,157	29,336	1.66	467	486	4.1
Moore	4,721	5,205	0.11	5	6	20.0
Totals	**67,603**	**71,693**		**5,130**	**5,476**	**6.7**

Table 4-38. Population Estimates in Subwatershed 0603000306.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Huntland	Franklin	885	367	35	332	0

Table 4-39. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0603000306.

4.2.F.ii. Point Source Contributions.

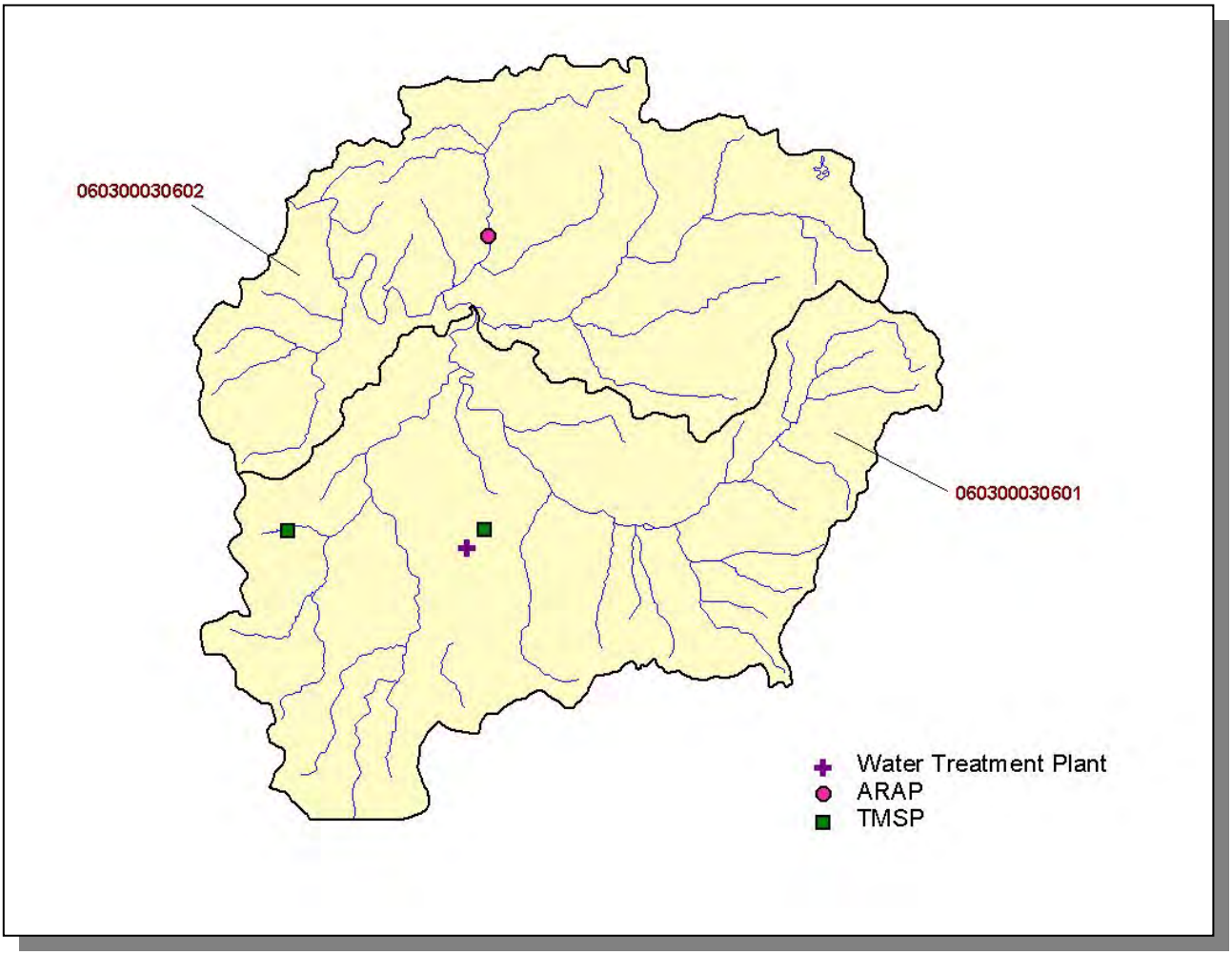

Figure 4-66. Location of Active Point Source Facilities in Subwatershed 0603000306. *Subwatershed 060300030601 and 060300030602 boundaries are shown for reference. More information is provided in the following charts.*

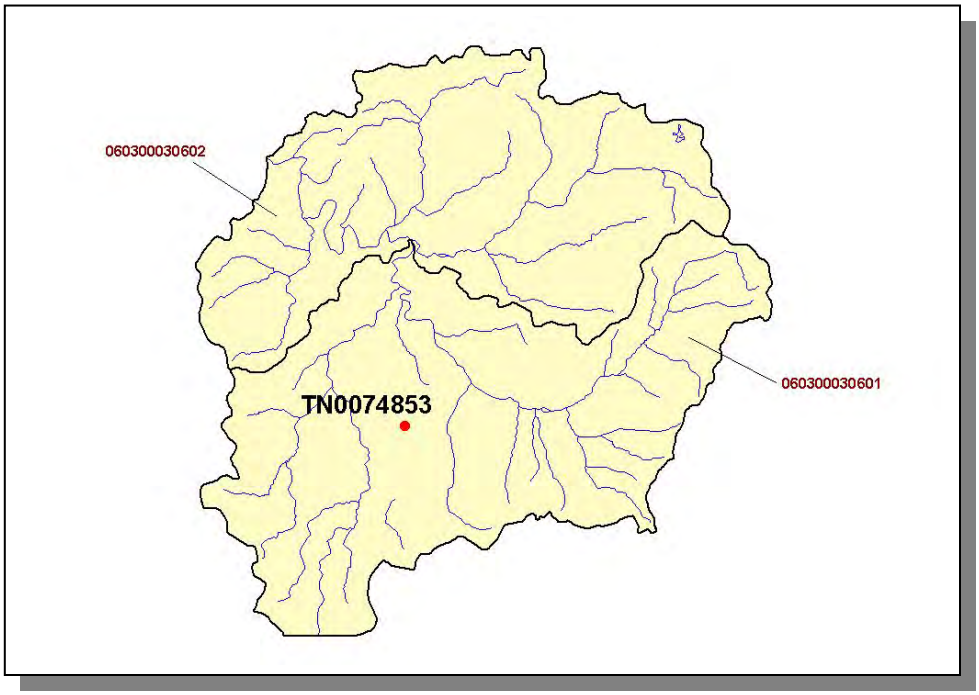

Figure 4-67. Location of Water Treatment Plant Sites in Subwatershed 0603000306. *Subwatershed 060300030601 and 060300030602 boundaries are shown for refere. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

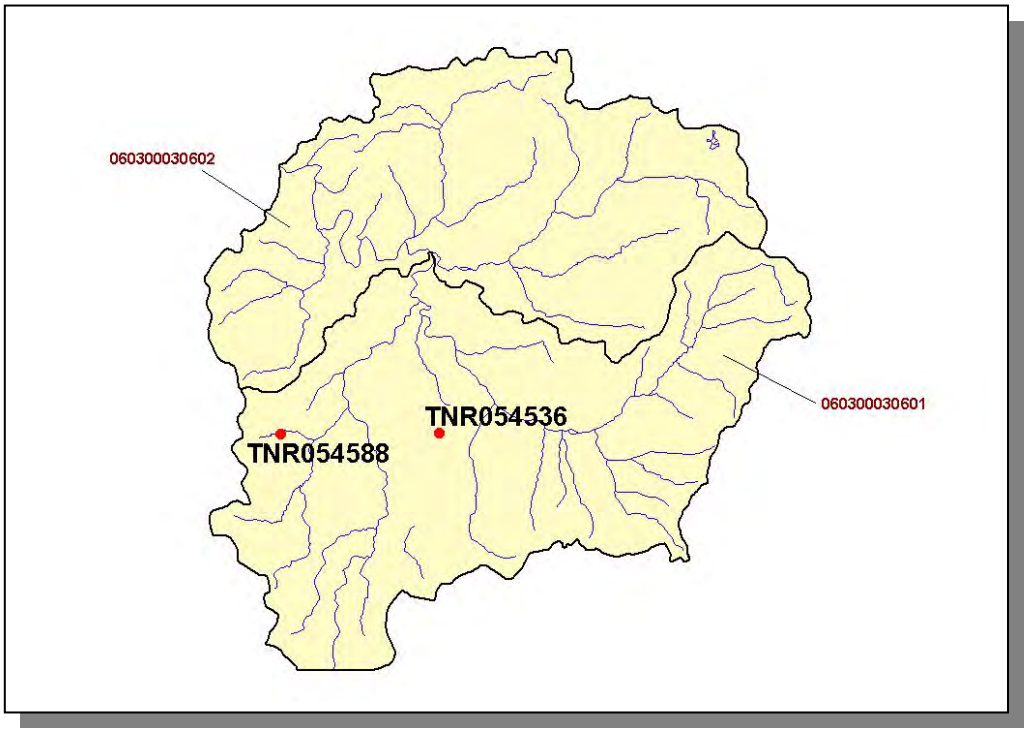

Figure 4-68. Location of TMSP Facilities in Subwatershed 0603000306. *Subwatershed 060300030601 and 060300030602 boundaries are shown for refere. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

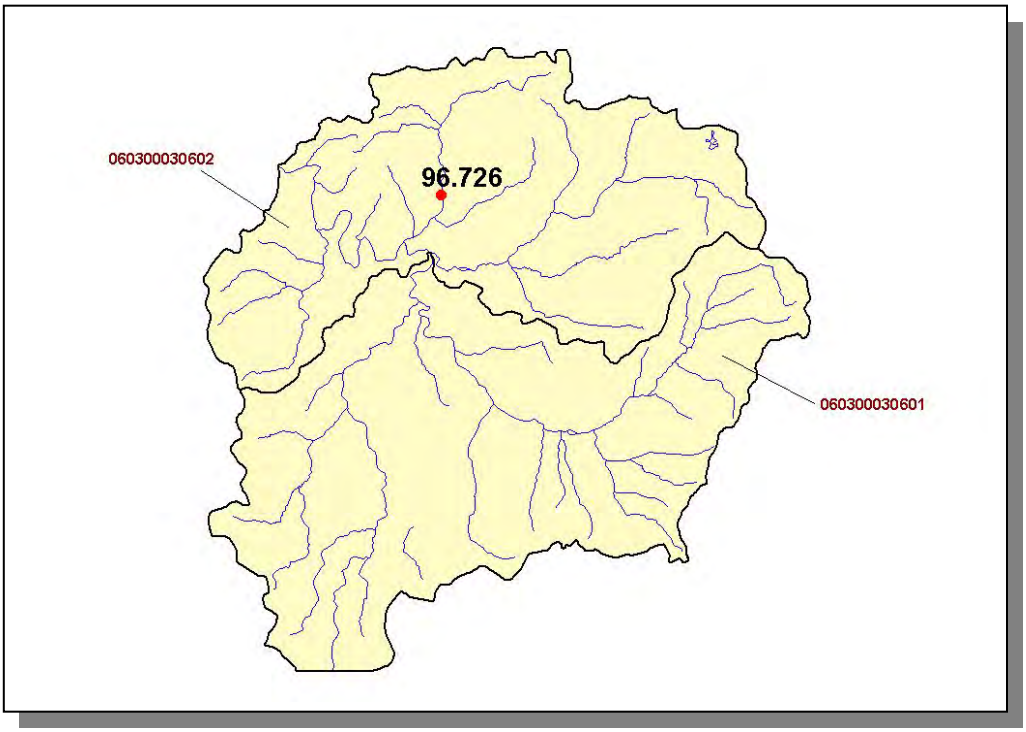

Figure 4-69. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000306. *Subwatershed 060300030601 and 060300030602 boundaries are shown for refere. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

4.2.F.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Milk Cow	Cattle	Chickens	Chickens Sold	Hogs	Sheep
3,692	748	8,059	7	1,973,379	4,449	31

Table 4-40. Summary of Livestock Count Estimates in Subwatershed 0603000306. *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)
Franklin	183.4	183.0	6.0	28.7
Lincoln	136.7	136.7	1.1	3.2
Moore	36.6	36.6	0.0	0.0
Total	**356.7**	**356.3**	**7.1**	**31.9**

Table 4-41. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 0603000306.

CROPS	TONS/ACRE/YEAR
Grass (Hayland)	0.23
Legume (Hayland)	1.47
Legume/Grass (Hayland)	0.37
Grass (Pastureland)	0.42
Grass, Forbs, Legumes (Mixed (Pasture)	0.57
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Soybeans (Row Crops)	4.26
Corn (Row Crops)	5.36
Tobacco (Row Crops)	9.27
Potatoes (Row Crops)	3.04
Wheat (Close Grown Cropland)	5.29
Other Close Grown Cropland	5.82
Fruit (Horticulture)	0.09
Other (Horticulture)	1.92
Other Vegetable and Truck Crop	2.52
Conservation Reserve Program Land	0.11
Other Cropland not Planted	2.04
Non Agricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.16
Other Land in Farms	0.28

Table 4-42. Annual Estimated Total Soil Loss in Subwatershed 0603000306.

4.2.G. 0603000307.

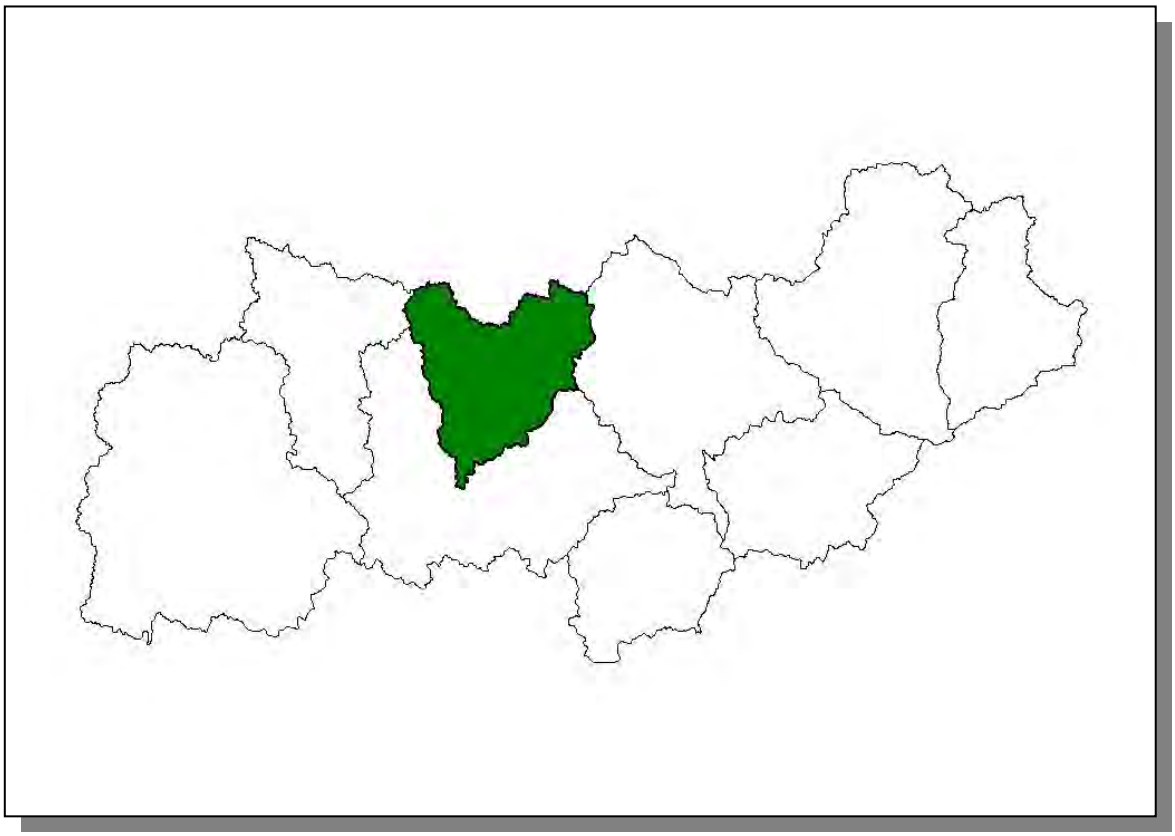

Figure 4-70. Location of Subwatershed 0603000307. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.G.i. General Description.

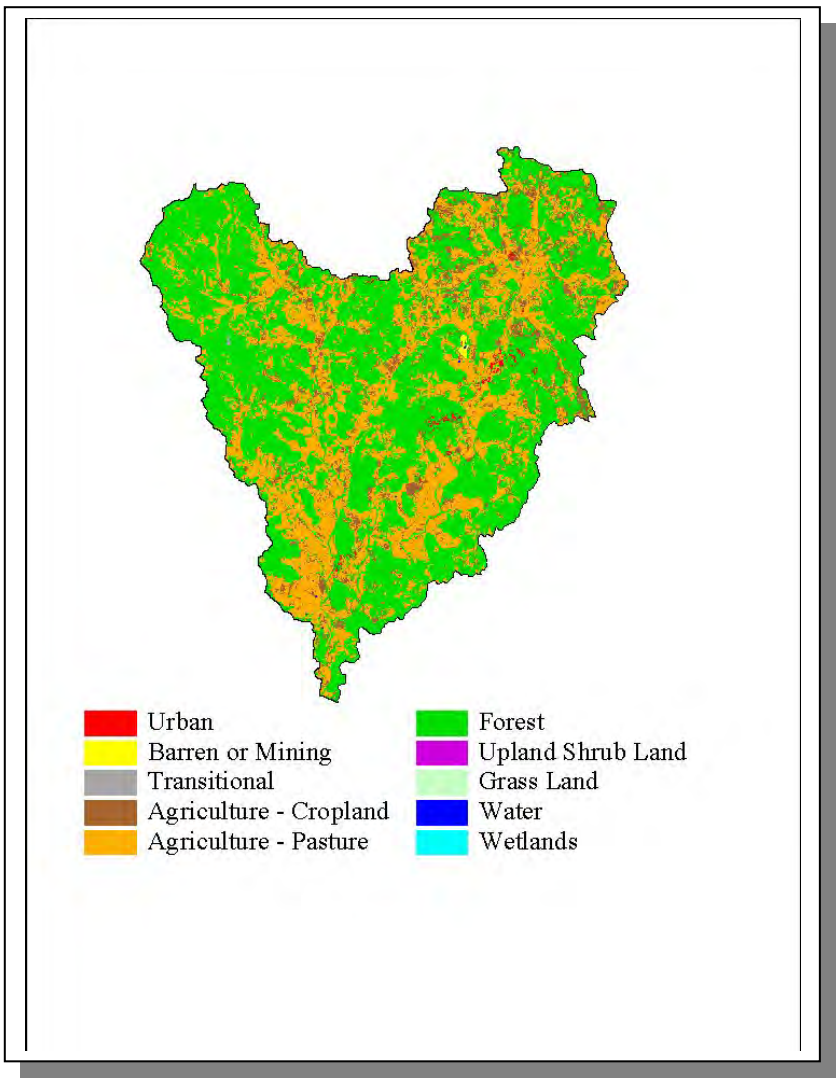

Figure 4-71. Illustration of Land Use Distribution in Subwatershed 0603000307.

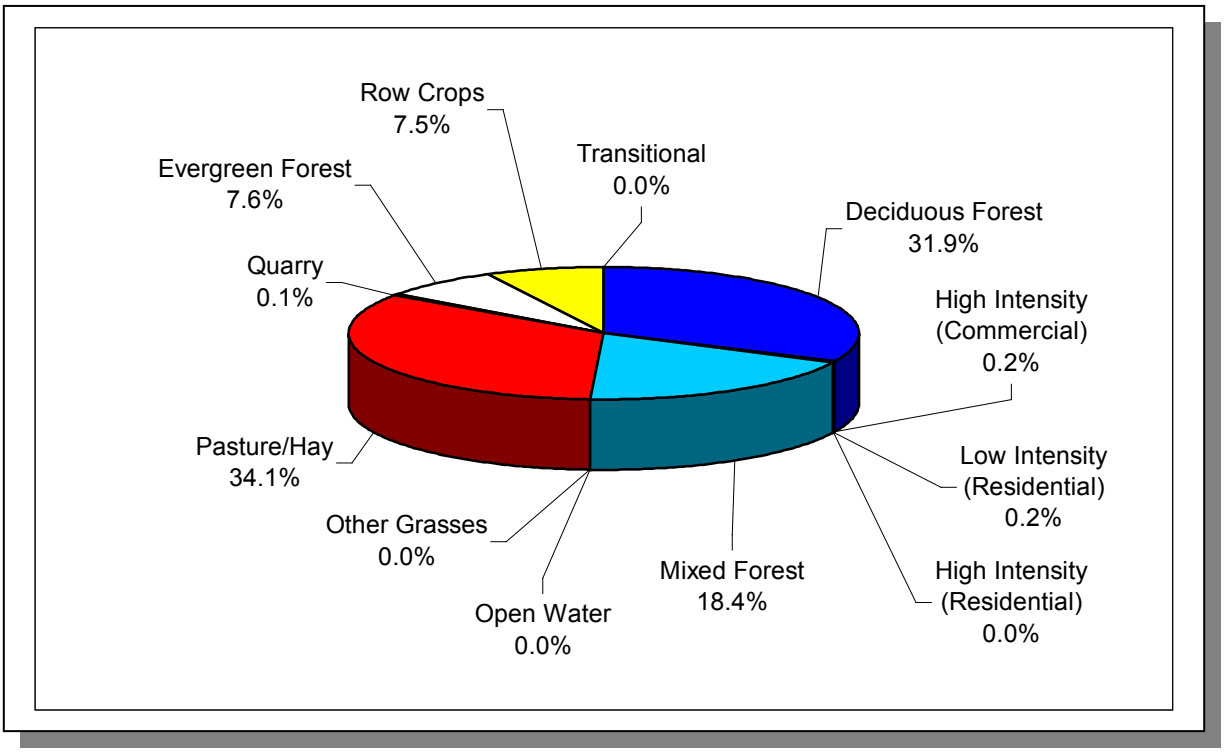

Figure 4-72. Land Use Distribution in Subwatershed 0603000307. *More information is provided in Upper Elk-Appendix IV.*

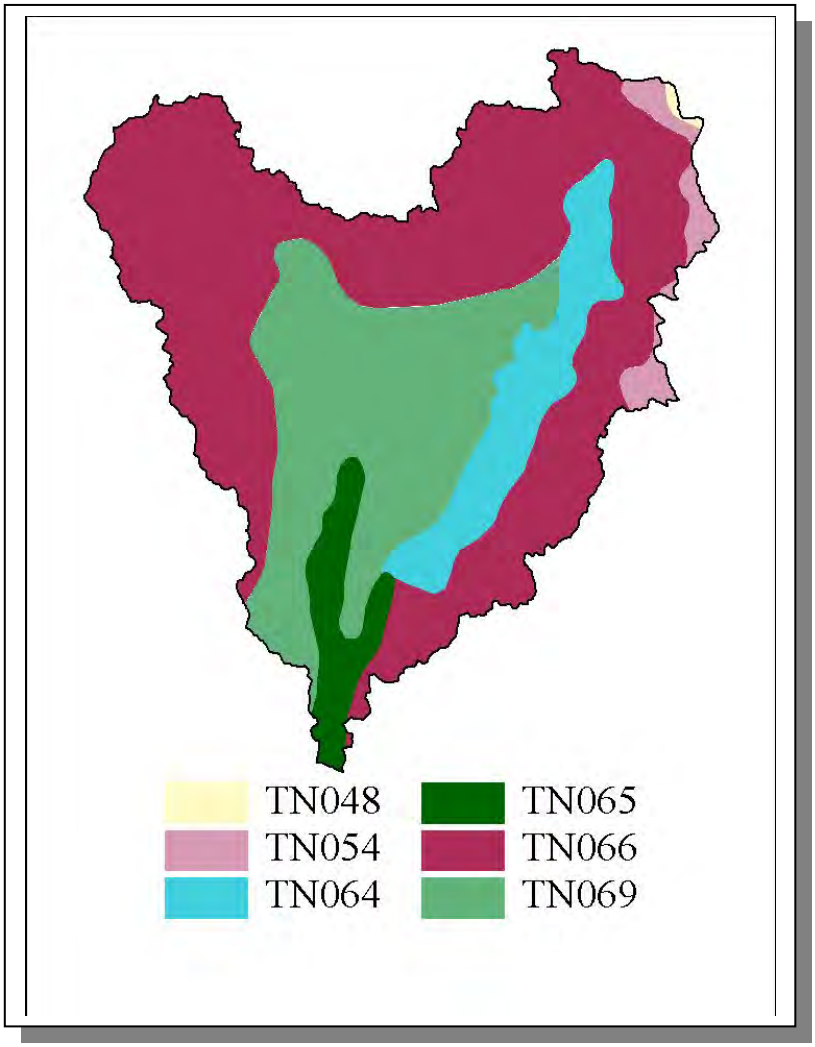

Figure 4-73. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000307.

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STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN048	8.00	C	1.38	5.06	Silty Loam	0.42
TN054	0.00	C	3.04	4.84	Loam	0.32
TN064	7.00	C	1.19	5.82	Silty Loam	0.37
TN065	0.00	C	1.15	5.52	Loam	0.32
TN066	0.00	B	2.62	4.75	Loam	0.28
TN069	0.00	C	2.06	5.36	Loam	0.34

Table 4-43. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000307. *More information is provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Bedford	30,411	34,411	0.05	14	16	14.3
Lincoln	28,157	28,157	8.12	2,286	2,382	4.2
Moore	4,721	4,721	40.36	1,905	2,101	10.3
Totals	**63,289**	**63,289**		**4,205**	**4,499**	**7.0**

Table 4-44. Population Estimates in Subwatershed 0603000307.

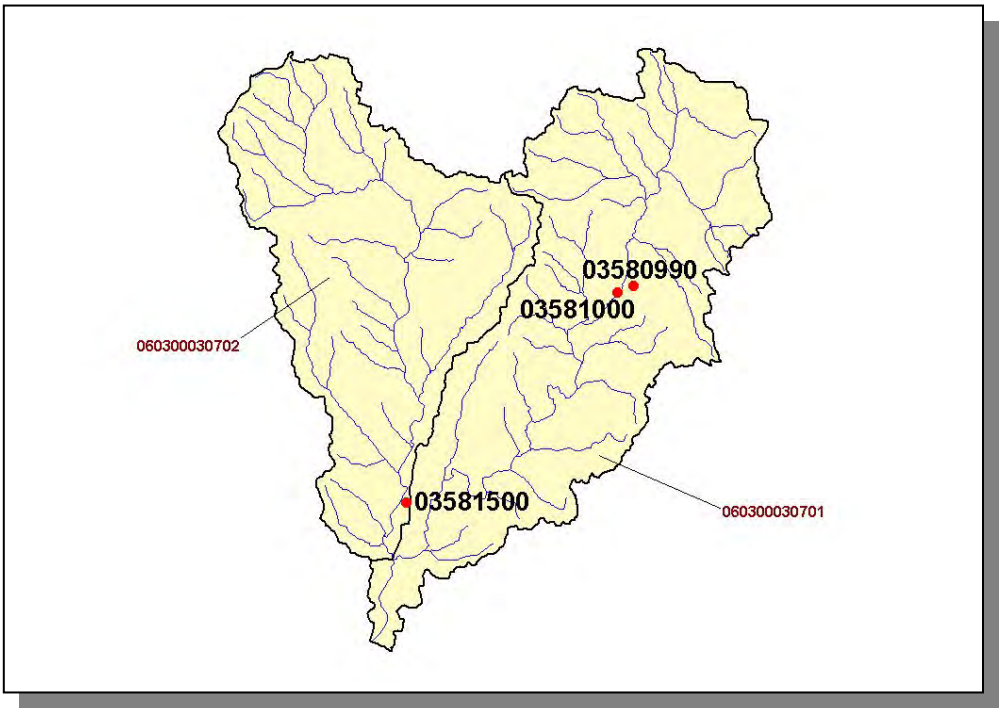

Figure 4-74. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000307. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

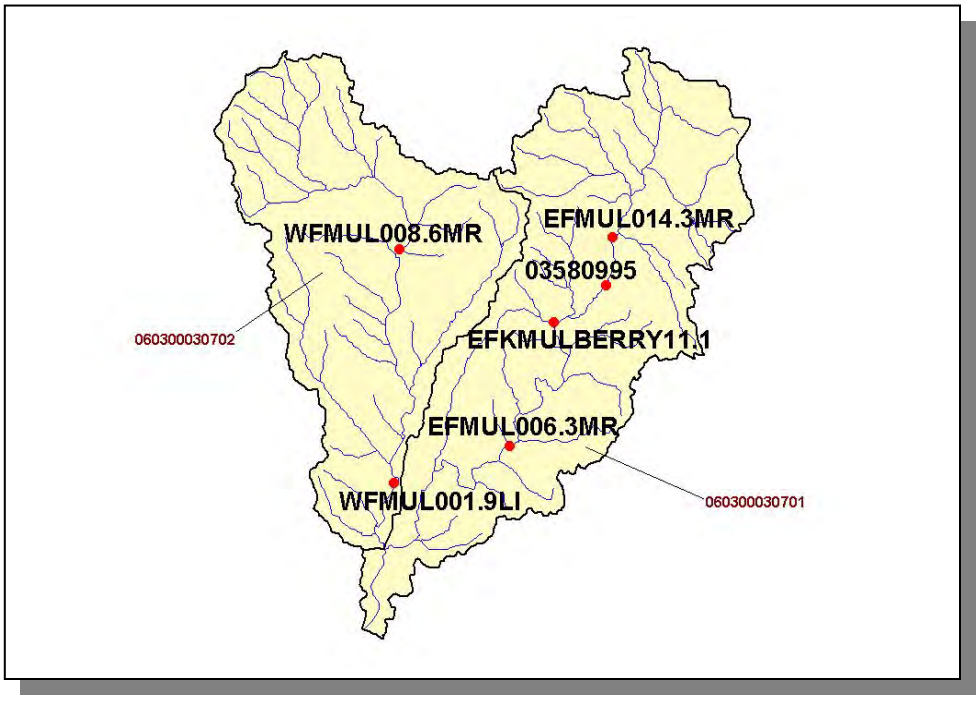

Figure 4-75. Location of STORET Monitoring Sites in Subwatershed 0603000307. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.G.ii. Point Source Contributions.

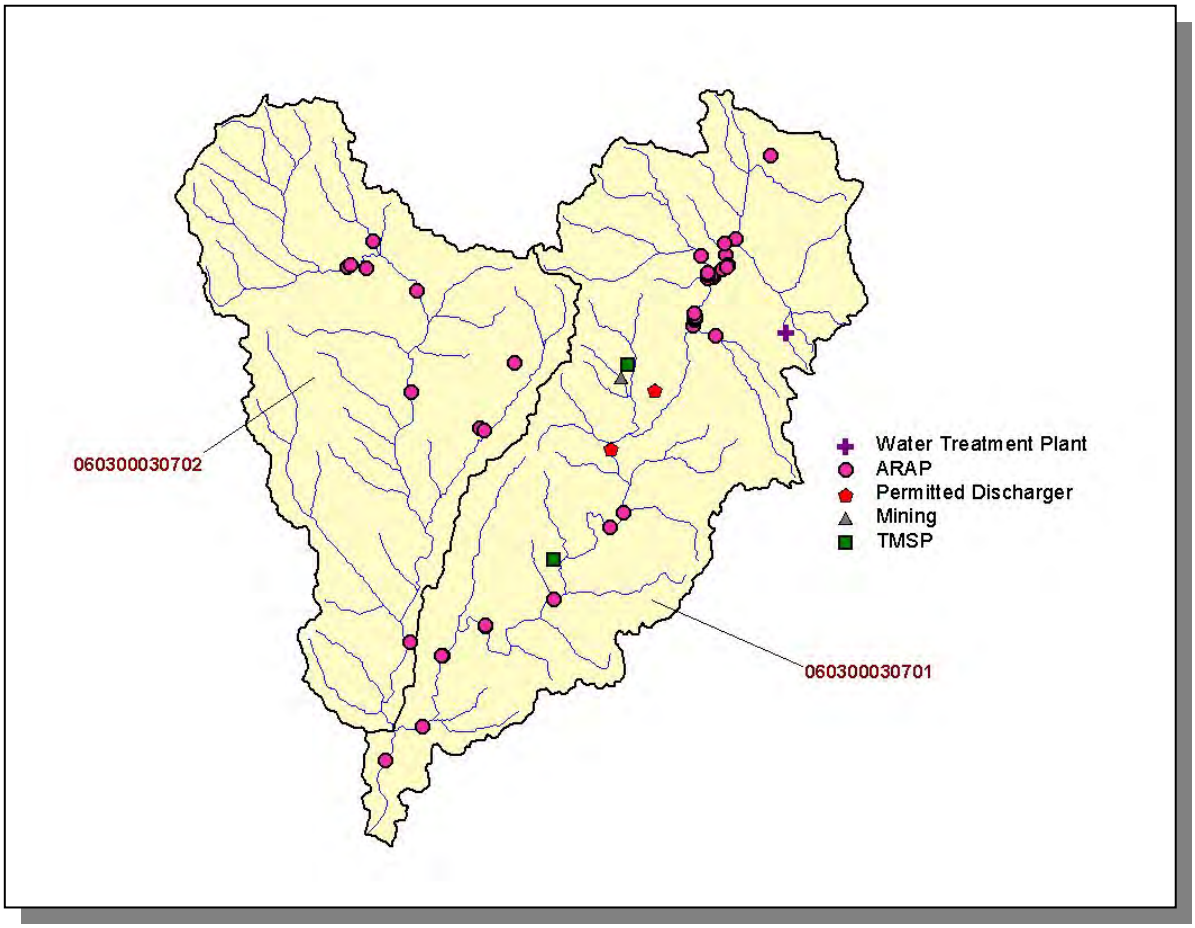

Figure 4-76. Location of Active Point Source Facilities in Subwatershed 0603000307. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information is provided in the following charts.*

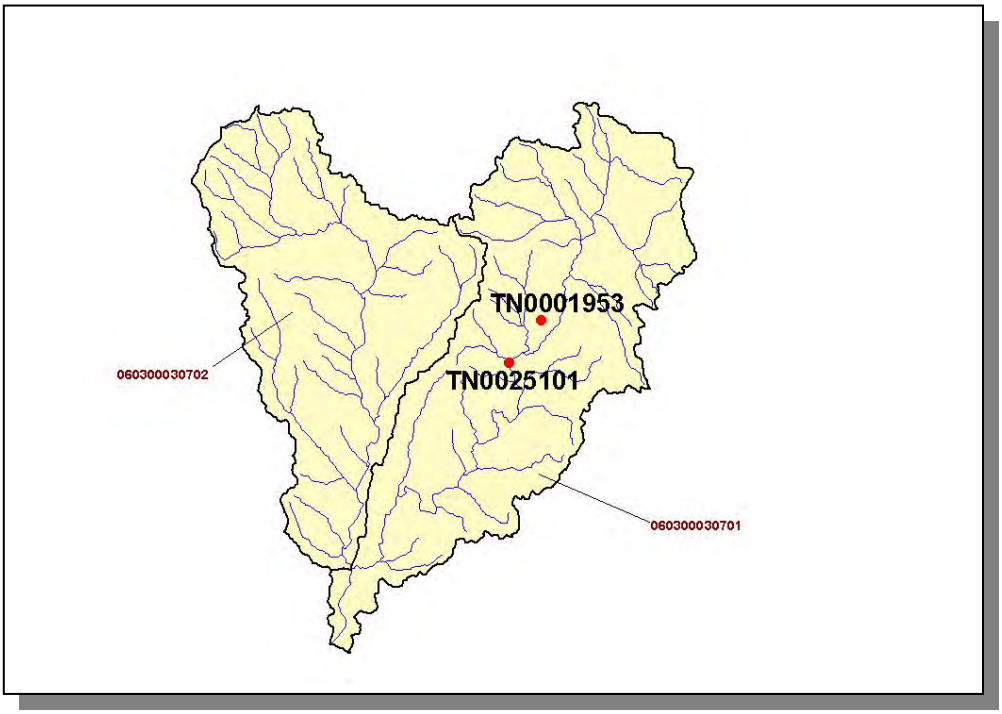

Figure 4-77. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0603000307. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

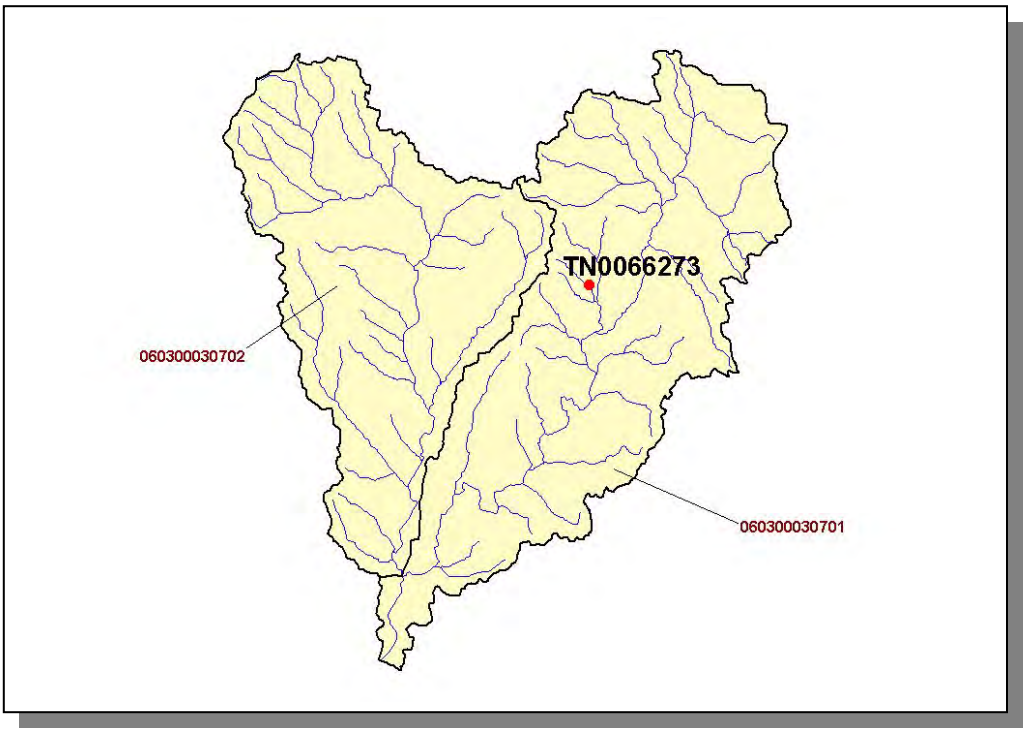

Figure 4-78. Location of Active Mining Sites in Subwatershed 0603000307. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

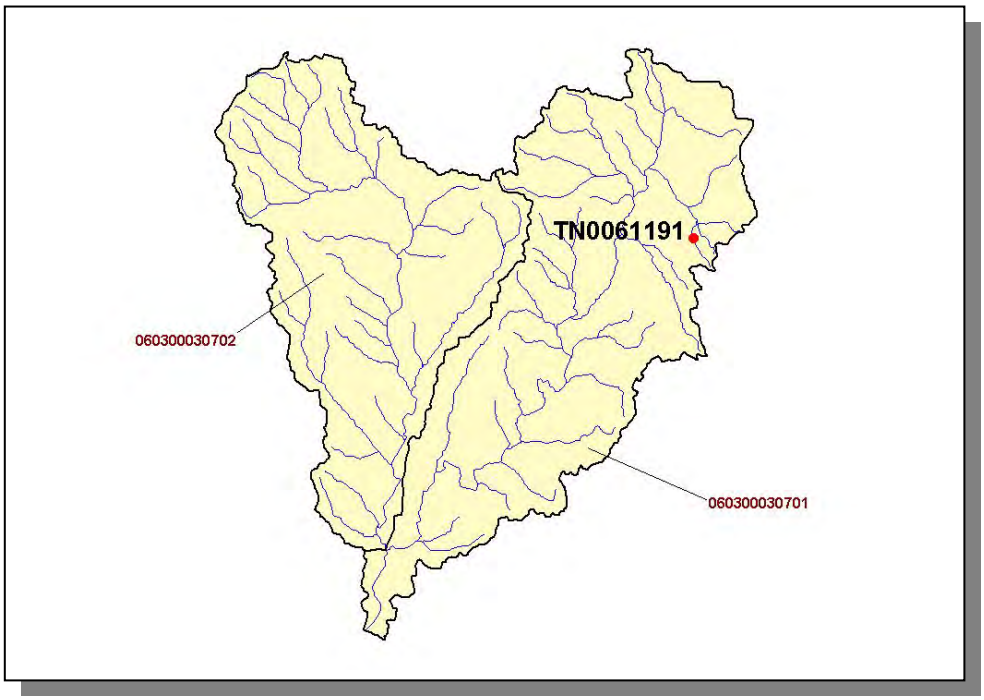

Figure 4-79. Location of Water Treatment Plant Sites in Subwatershed 0603000301. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV*

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Figure 4-80. Location of TMSP Facilities in Subwatershed 0603000307. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

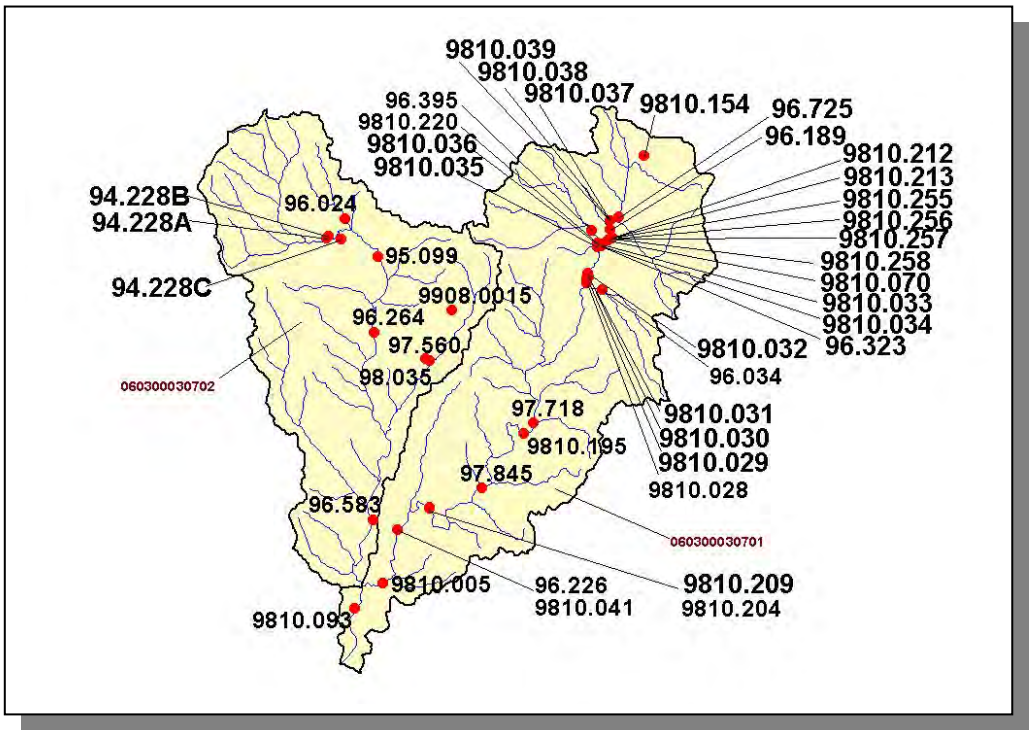

Figure 4-81. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000307. *Subwatershed 060300030701 and 060300030702 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

4.2.G.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
6,214	12,556	752	15	1,669,843	311	74

Table 4-45. Summary of Livestock Count Estimates in Subwatershed 0603000307. *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)
Bedford	74.6	74.6	0.5	1.3
Lincoln	136.7	136.7	1.1	3.2
Moore	36.6	36.6	0.0	0.0
Totals	**247.9**	**247.9**	**1.6**	**4.5**

Table 4-46. Forest Acreage and Average Removal Rates (1987-1994) in Subwatershed 0603000307.

CROPS	TONS/ACRE/YEAR
Grass (Hayland)	0.78
Legume (Hayland)	0.22
Legume/Grass (Hayland)	0.41
Grass (Pastureland)	1.63
Grass, Forbs, Legumes (Mixed Pasture)	1.53
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Corn (Row Crops)	3.89
Soybeans (Row Crops)	7.21
Tobacco (Row Crops)	9.27
Potatoes (Row Crops)	3.05
Wheat (Close Grown Cropland)	3.28
Fruit (Horticultural)	0.09
Other Vegetable and Truck Crop	2.52
Summer Fallow (Other Cropland)	4.60
Other Land in Farms	0.28
Conservation Reserve Program Land	0.30
Farmsteads and Ranch Headquarters	0.27

Table 4-47. Annual Estimated Total Soil Loss in Subwatershed 0603000307.

4.2.G. 0603000308.

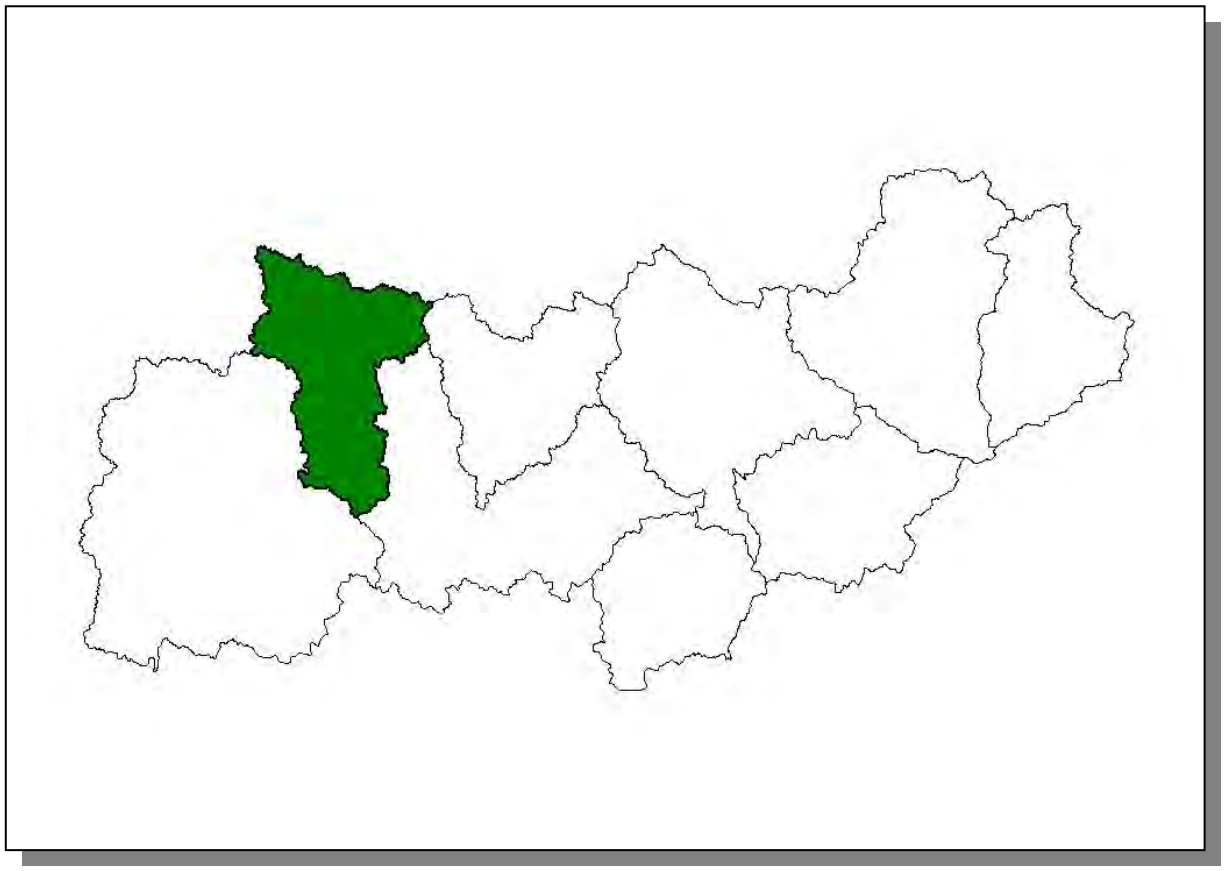

Figure 4-82. Location of Subwatershed 0603000308. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.G.i. General Description.

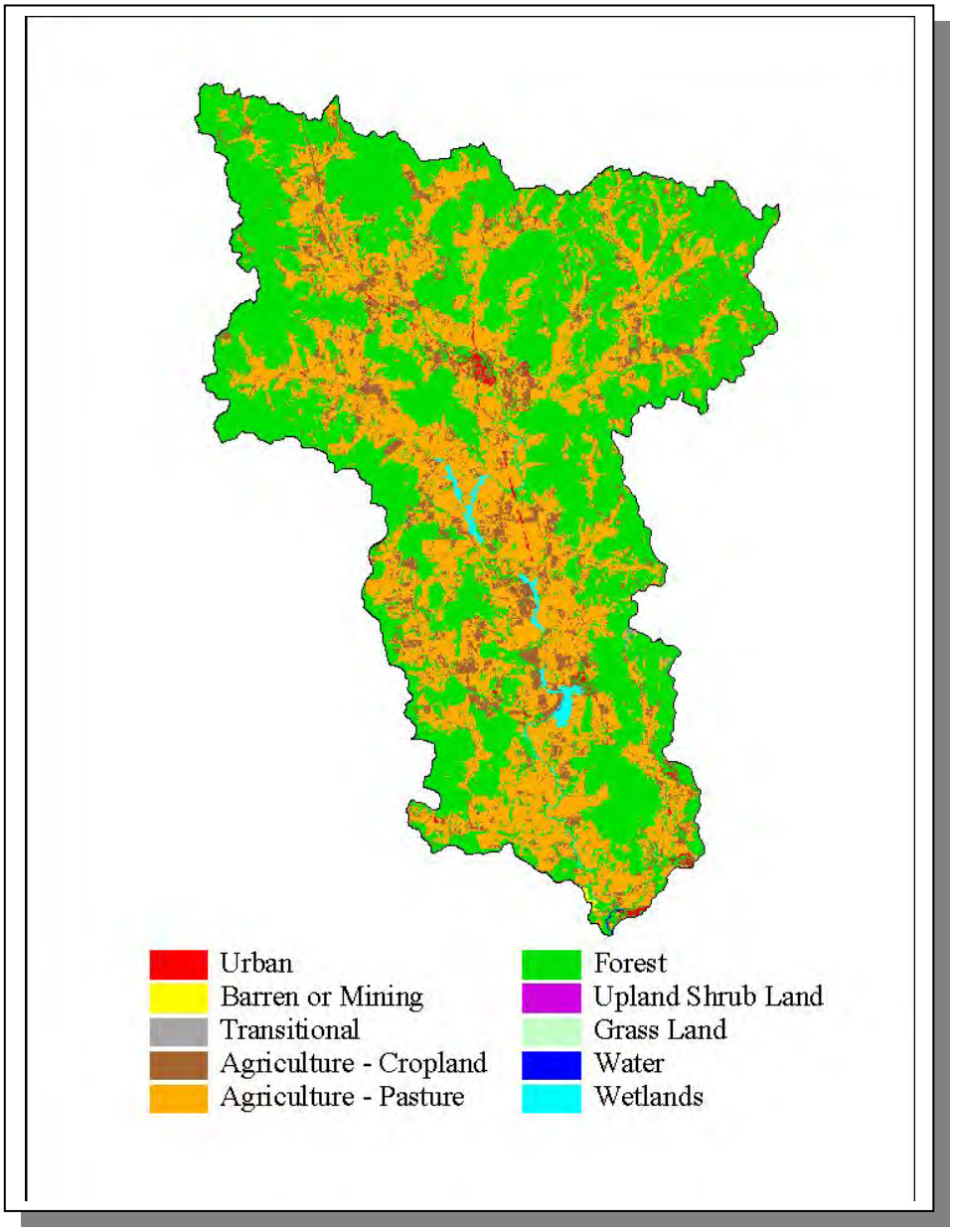

Figure 4-83. Illustration of Land Use Distribution in Subwatershed 0603000308.

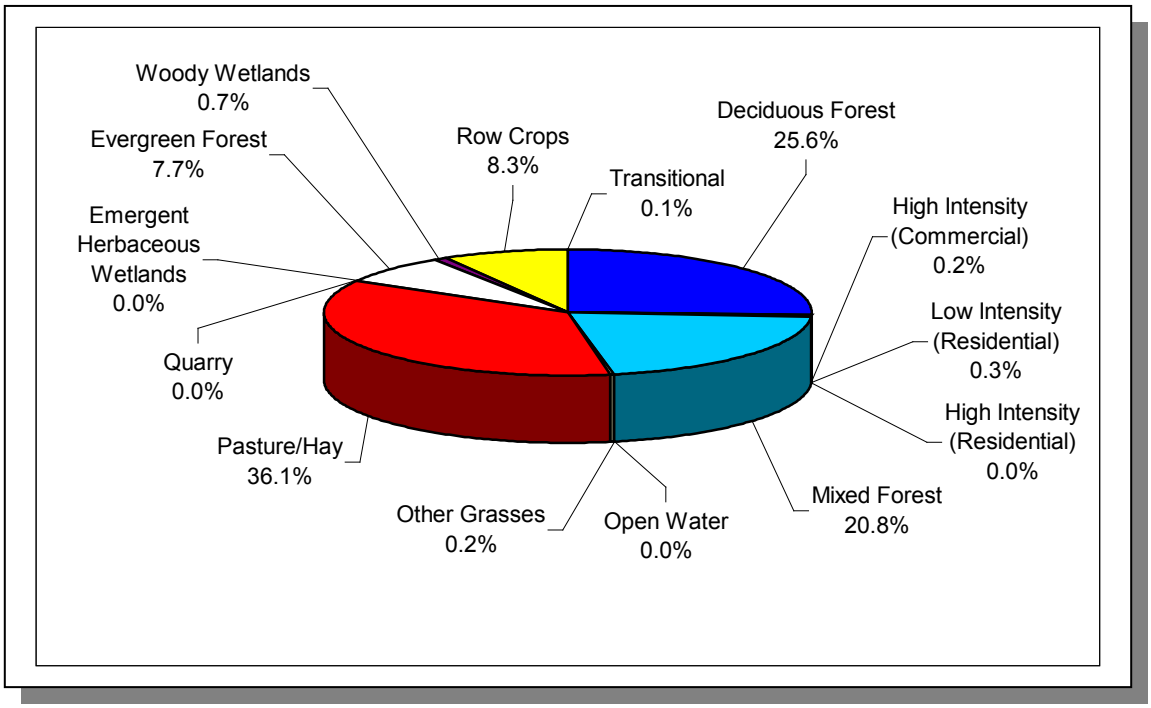

Figure 4-84. Land Use Distribution in Subwatershed 0603000308. *More information is provided in Upper Elk-Appendix IV.*

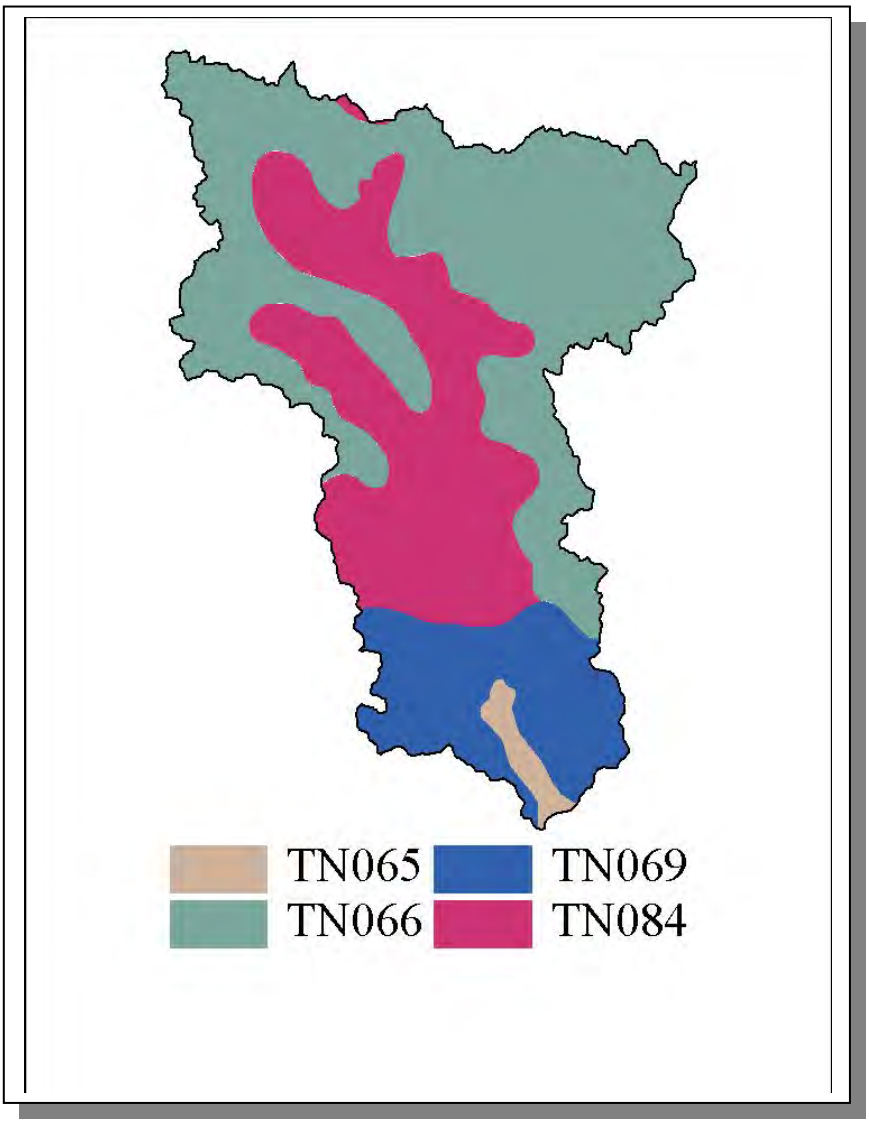

Figure 4-85. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000308.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN065	0.00	C	1.15	5.52	Loam	0.32
TN066	0.00	B	2.62	4.75	Loam	0.28
TN069	0.00	C	2.06	5.36	Loam	0.34
TN084	0.00	C	1.80	4.99	Silty Loam	0.28

Table 4-48. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000308. *More information is provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		PERCENT CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Lincoln	28,157	29,336	12.59	3,546	3,694	4.2
Marcshall	21,539	25,687	8.77	1,890	2,254	19.3
Totals	**49,696**	**55,023**		**5,436**	**5,948**	**9.4**

Table 4-49. Population Estimates in Subwatershed 0603000308.

NUMBER OF HOUSING UNITS						
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Petersburg	Marshall	514	248	14	230	4
Fayetteville	Lincoln	6,921	3,277	3,168	99	10
Total		**7,435**	**3,525**	**3,182**	**329**	**14**

Table 4-50. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0603000308.

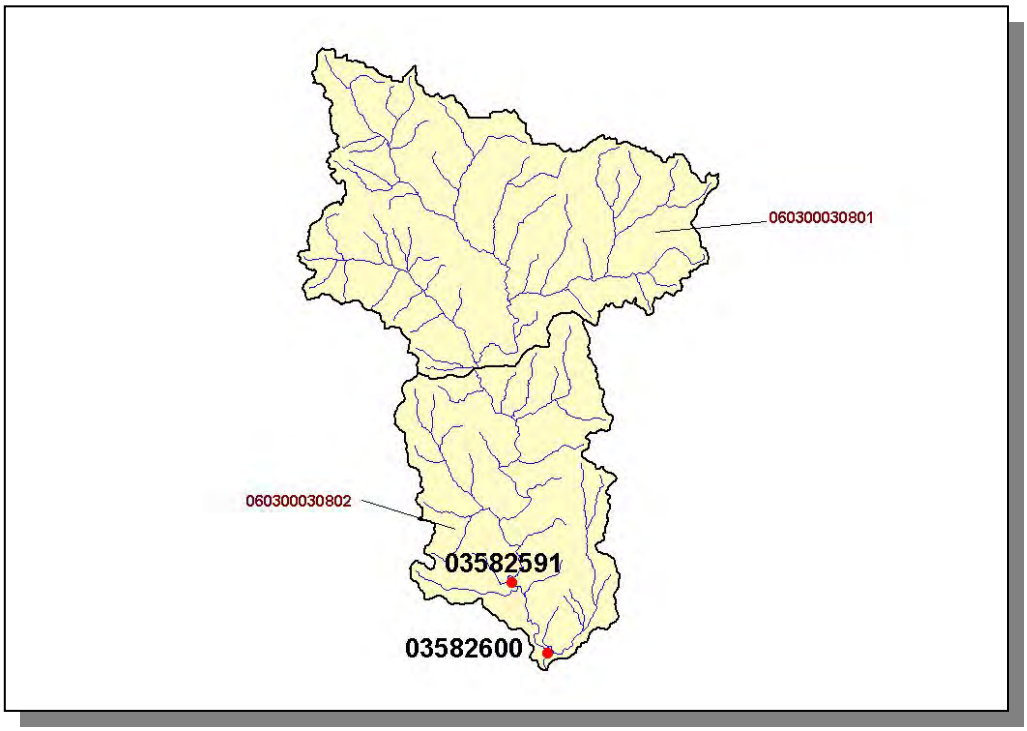

Figure 4-86. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000308. *Subwatershed 060300030801 and 060300030802 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

Figure 4-87. Location of STORET Monitoring Sites in Subwatershed 0603000308. *Subwatershed 060300030801 and 060300030802 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.G.ii. Point Source Contributions.

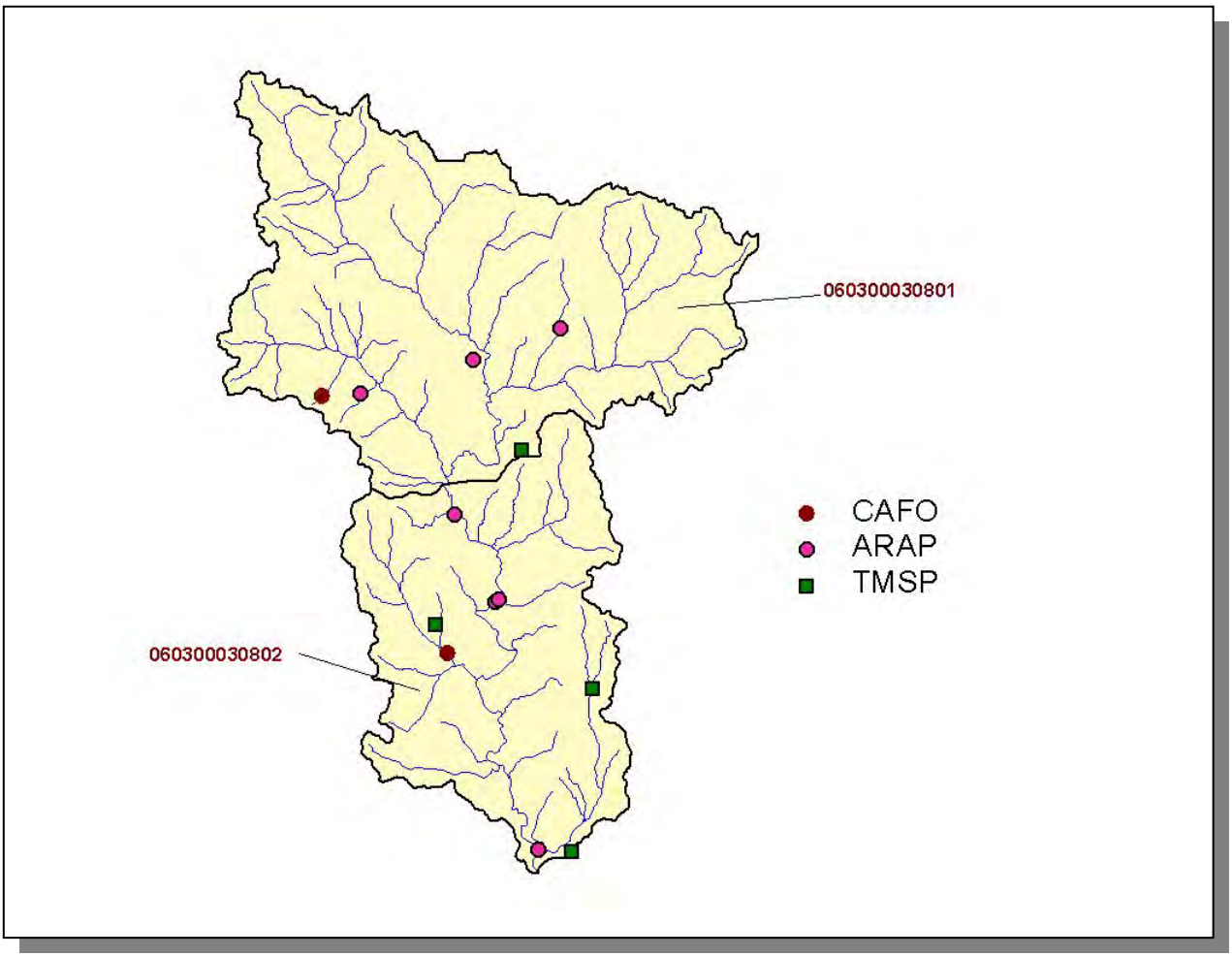

Figure 4-88. Location of Active Point Source Facilities in Subwatershed 0603000308. *Subwatershed 060300030801 and 060300030802 boundaries are shown for reference. More information is provided in the following charts.*

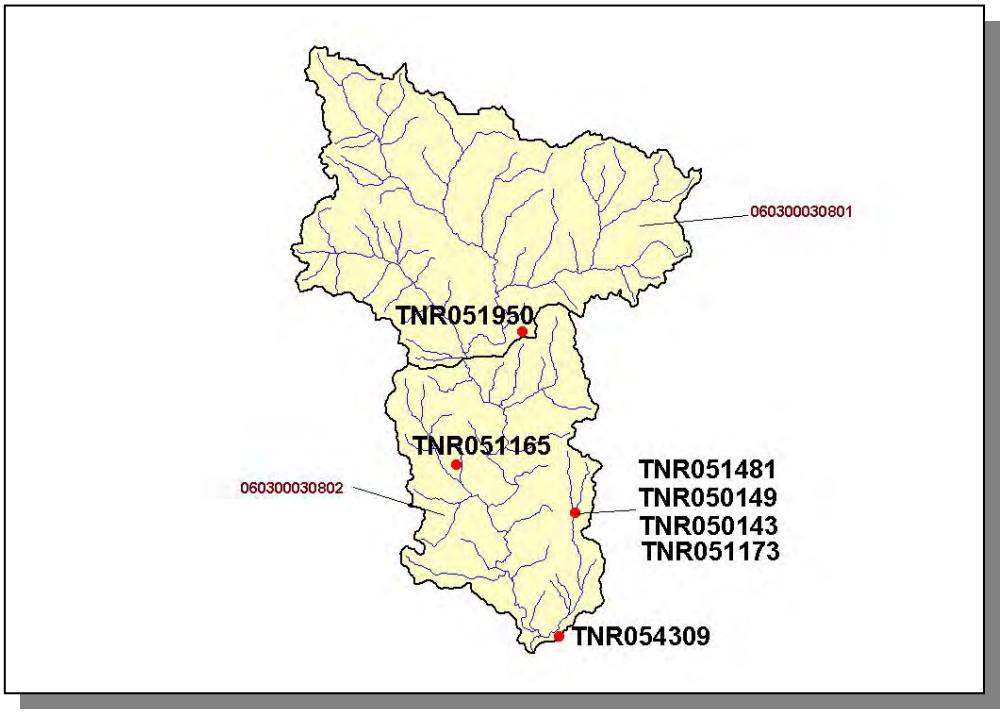

Figure 4-89. Location of TMSP Facilities in Subwatershed 0603000308. *Subwatershed 060300030801 and 060300030802 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

Figure 4-90. Location of CAFO Facilities in Subwatershed 0603000308. *Subwatershed 060300030801 and 060300030802 boundaries are shown for reference. CAFO rules may be found at http://cfpub.epa.gov/npdes/afo/cafofinalrule.cfm. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

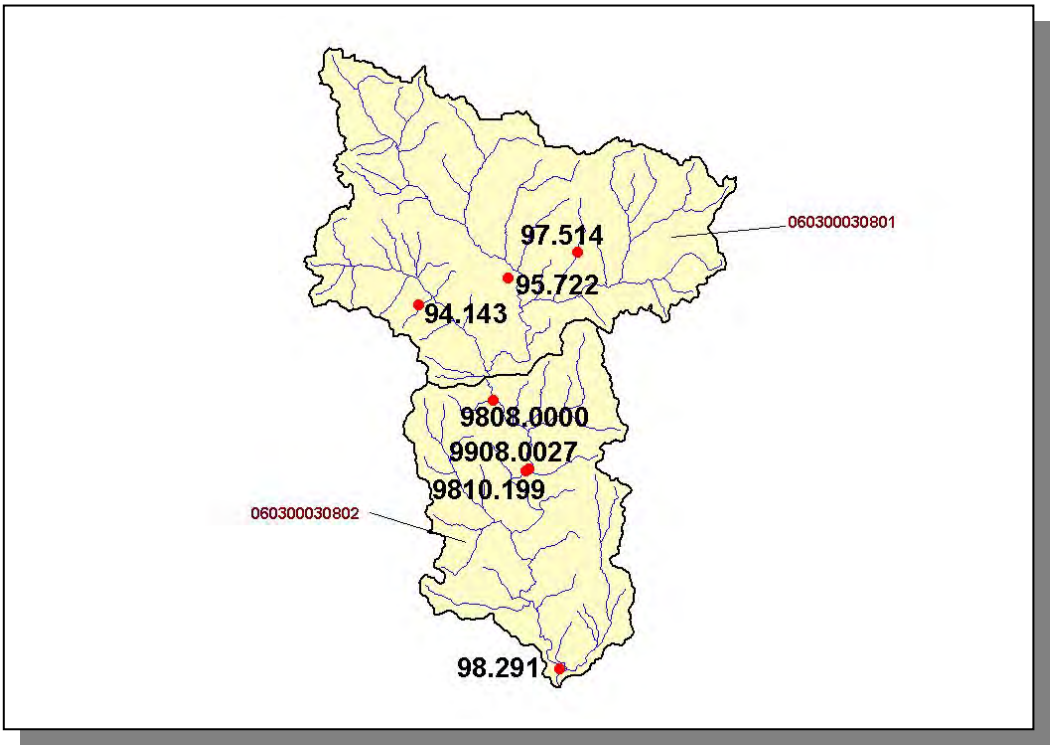

Figure 4-91. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000308. *Subwatershed 060300030801 and 060300030802 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

4.2.G.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
6,757	14,159	1,193	14	722,893	930	94

Table 4-51. Summary of Livestock Count Estimates in Subwatershed 0603000308. *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)
Lincoln	136.7	136.7	1.1	3.2

Table 4-52. Forest Acreage and Average Removal Rates (1987-1994) in Subwatershed 0603000308.

CROPS	TONS/ACRE/YEAR
Grass (Hayland)	0.26
Legume (Hayland)	0.26
Legume/Grass (Hayland)	1.00
Grass (Pastureland)	1.01
Grass, Forbs, Legumes (Mixed Pasture)	0.86
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Corn (Row Crops)	5.43
Soybeans (Row Crops)	6.73
Potatoes (Row Crops)	3.04
Tobacco (Row Crops)	9.27
Conservation Reserve Program Land	0.26
Wheat (Close Grown Cropland)	4.75
Other Vegetable and Truck Crops	2.52
Fruit (Horticulture)	0.09
Summer Fallow (Other Cropland)	8.75
Nonagricultural land Use	0.00
Farmsteads and Ranch Headquarters	0.30
Other Land in Farms	0.21

Table 4-53. Annual Estimated Total Soil Loss in Subwatershed 0603000308.

4.2.G. 0603000309.

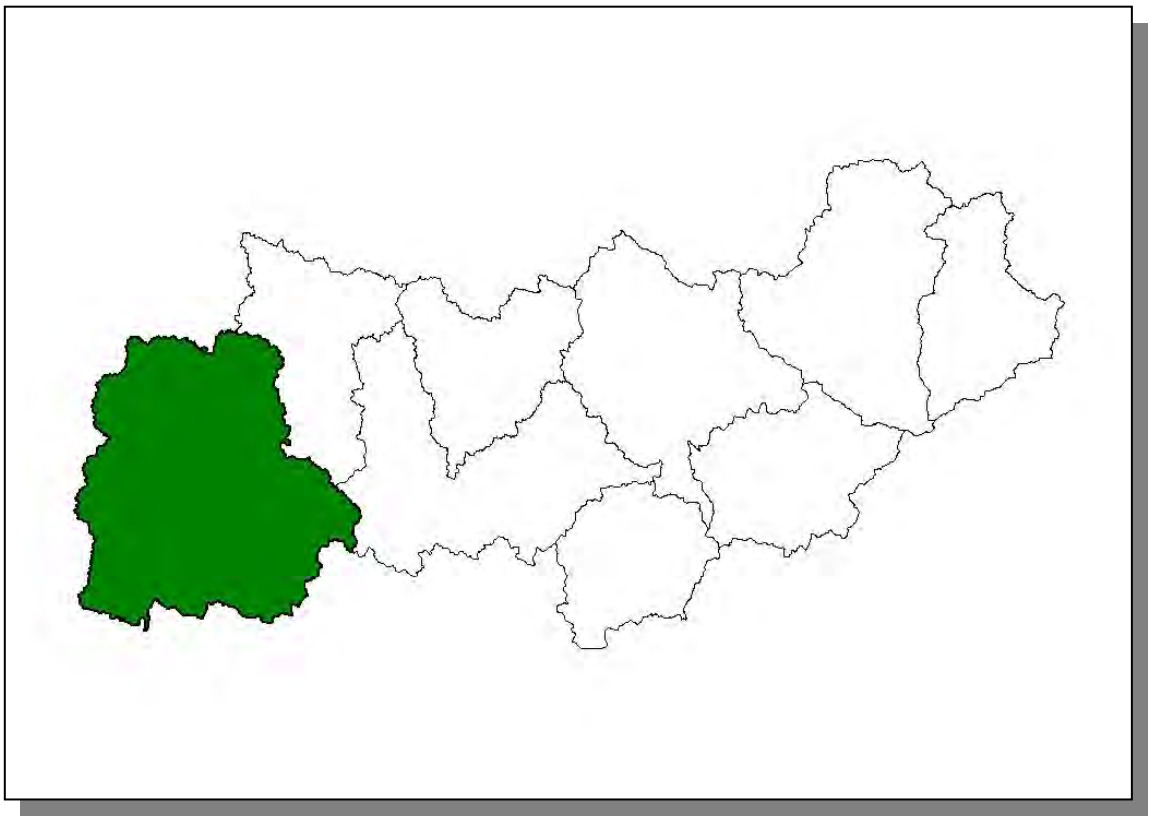

Figure 4-92. Location of Subwatershed 0603000309. *All Upper Elk HUC-10 subwatershed boundaries are shown for reference.*

4.2.G.i. General Description.

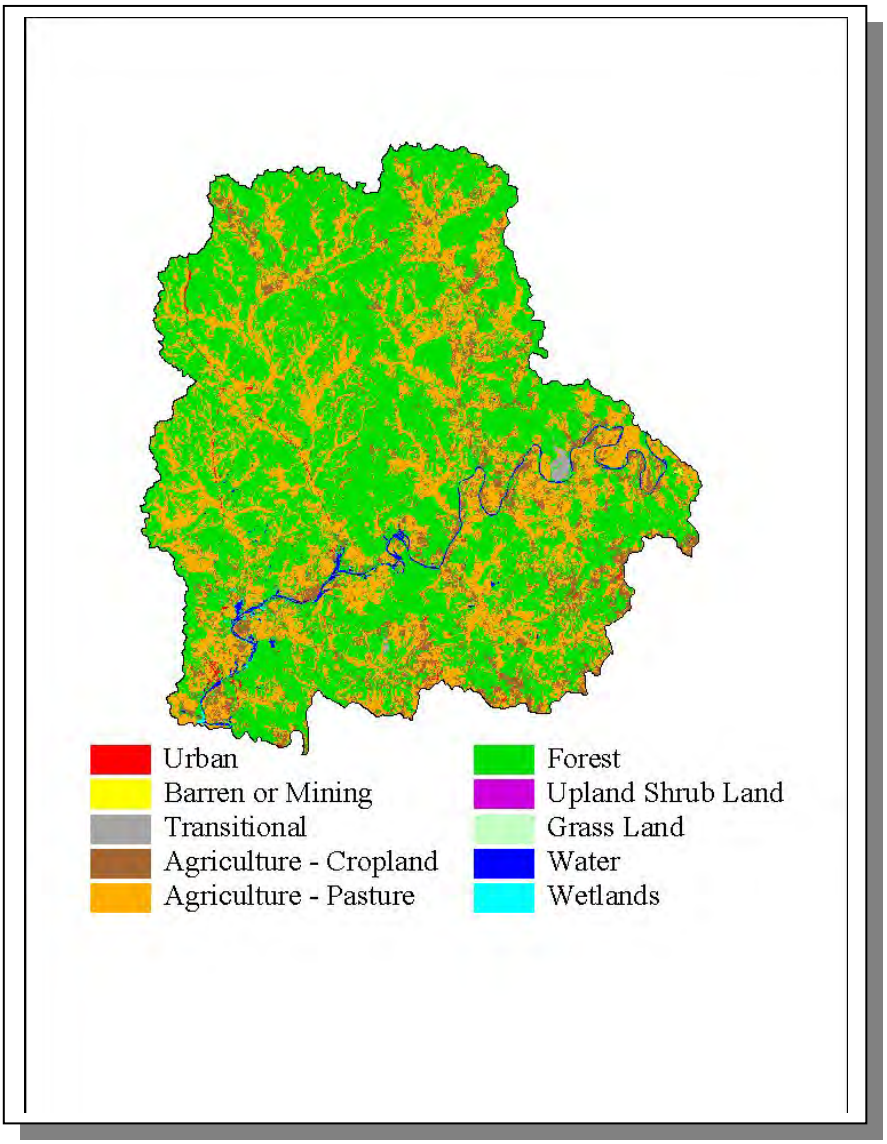

Figure 4-93. Illustration of Land Use Distribution in Subwatershed 0603000309.

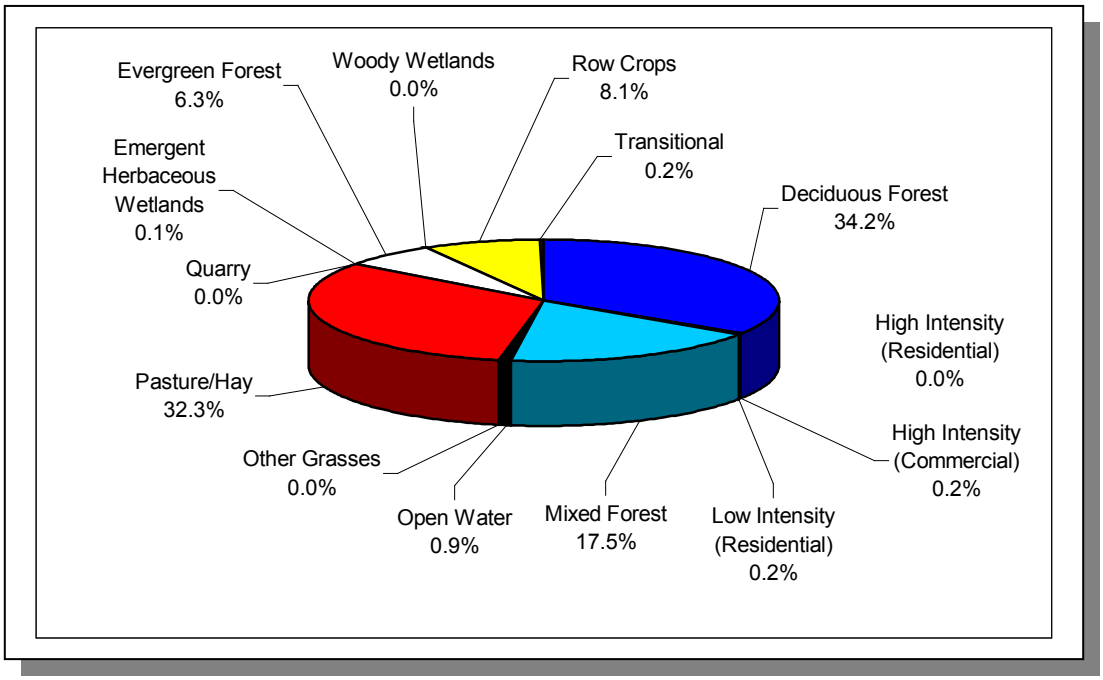

Figure 4-94. Land Use Distribution in Subwatershed 0603000309. *More information is provided in Upper Elk-Appendix IV.*

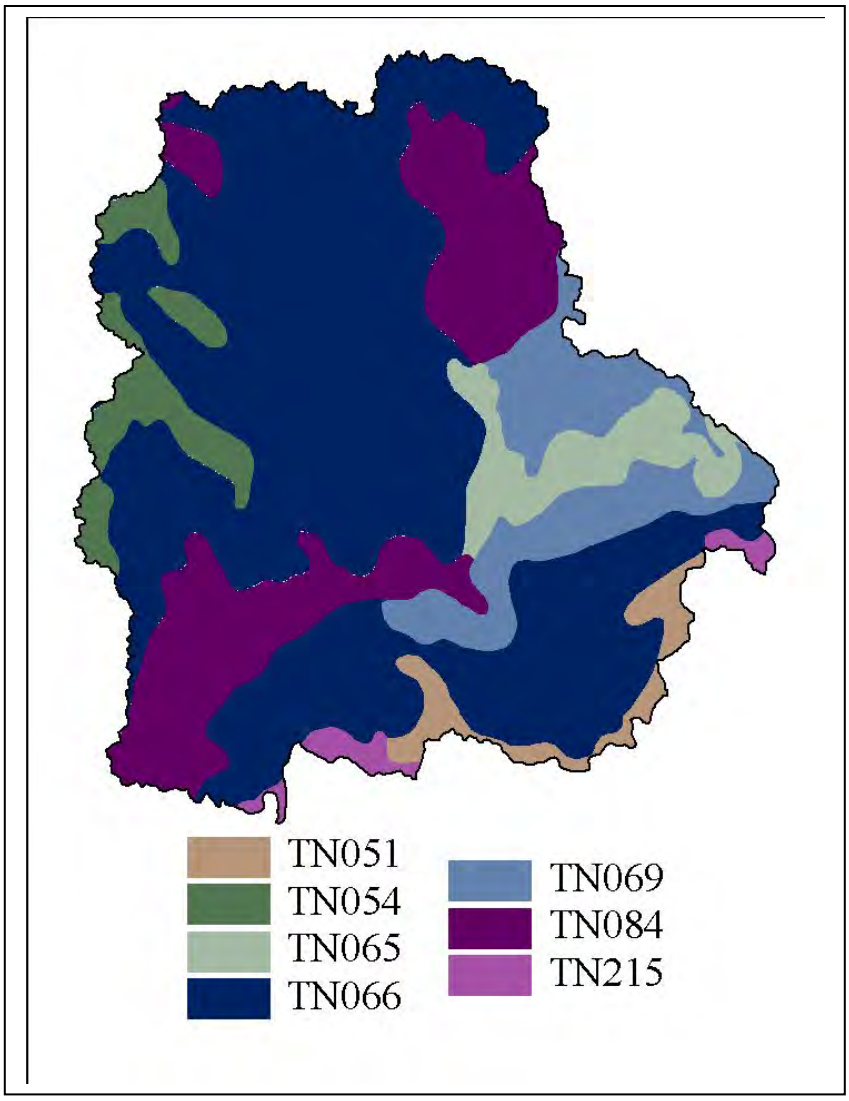

Figure 4-95. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000309.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hr)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN051	1.00	C	1.73	5.44	Loam	0.33
TN054	0.00	C	3.04	4.84	Loam	0.32
TN065	0.00	C	1.15	5.52	Loam	0.32
TN066	0.00	B	2.62	4.75	Loam	0.28
TN069	0.00	C	2.06	5.36	Loam	0.34
TN084	0.00	C	1.80	4.99	Silty Loam	0.28
TN215	9.00	C	1.57	5.02	Silty Loam	0.39

Table 4-54. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 0603000309. *More information is provided in Upper Elk-Appendix IV.*

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		% CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Giles	25,741	28,515	13.95	3,592	3,979	10.8
Lincoln	28,157	29,336	31.21	8,788	9,156	4.2
Marshall	21,539	25,687	2.69	579	691	19.3
Totals	**75,437**	**83,538**		**12,959**	**13,826**	**6.7**

Table 4-55. Population Estimates in Subwatershed 0603000309.

NUMBER OF HOUSING UNITS						
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Ardmore	Giles	828	342	191	150	0
Elkton	Giles	463	184	1	183	0
Total		**1,291**	**526**	**192**	**333**	**0**

Table 4-56. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 0603000309.

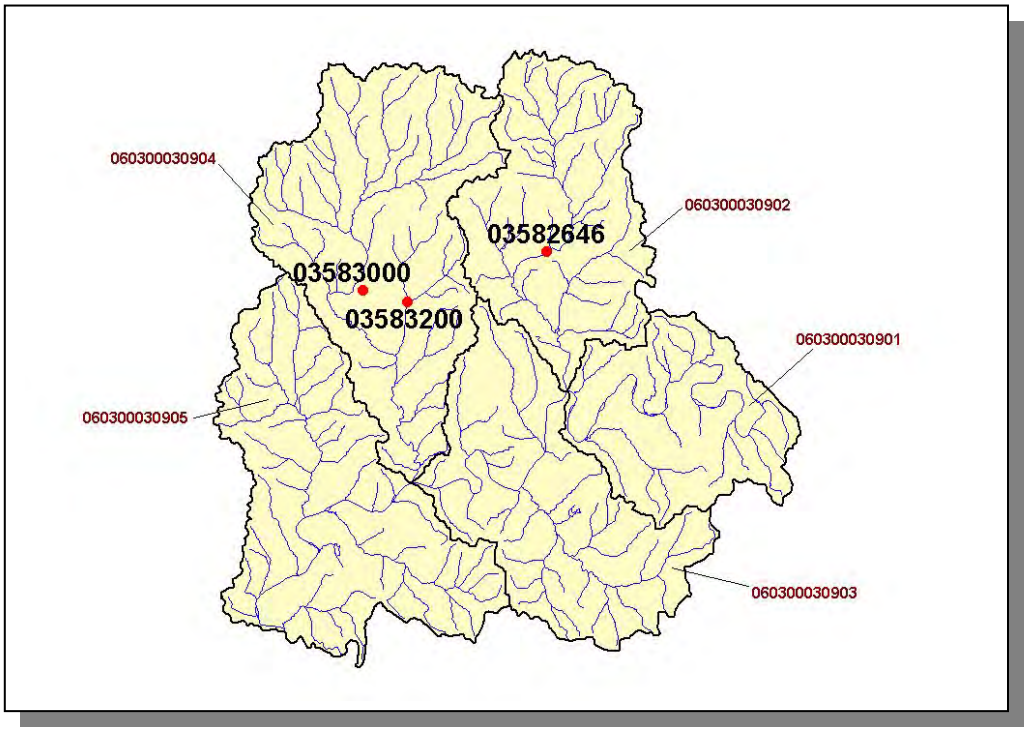

Figure 4-96. Location of Historical Streamflow Data Collection Sites in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

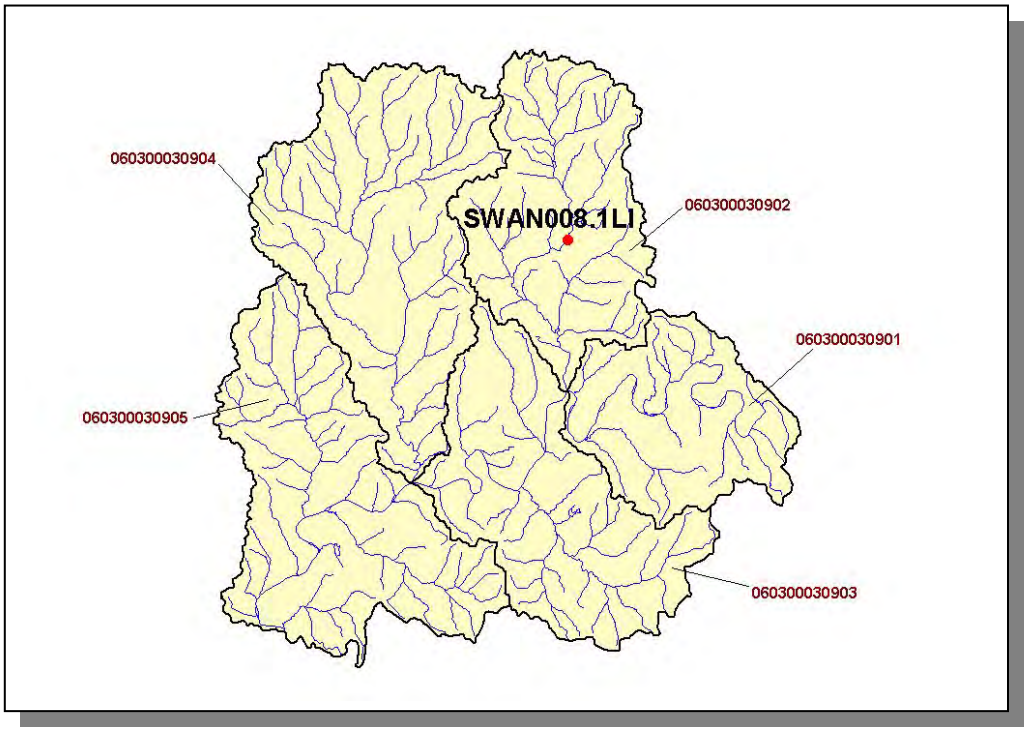

Figure 4-97. Location of STORET Monitoring Sites in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. More information is provided in Upper Elk-Appendix IV.*

4.2.G.ii. Point Source Contributions.

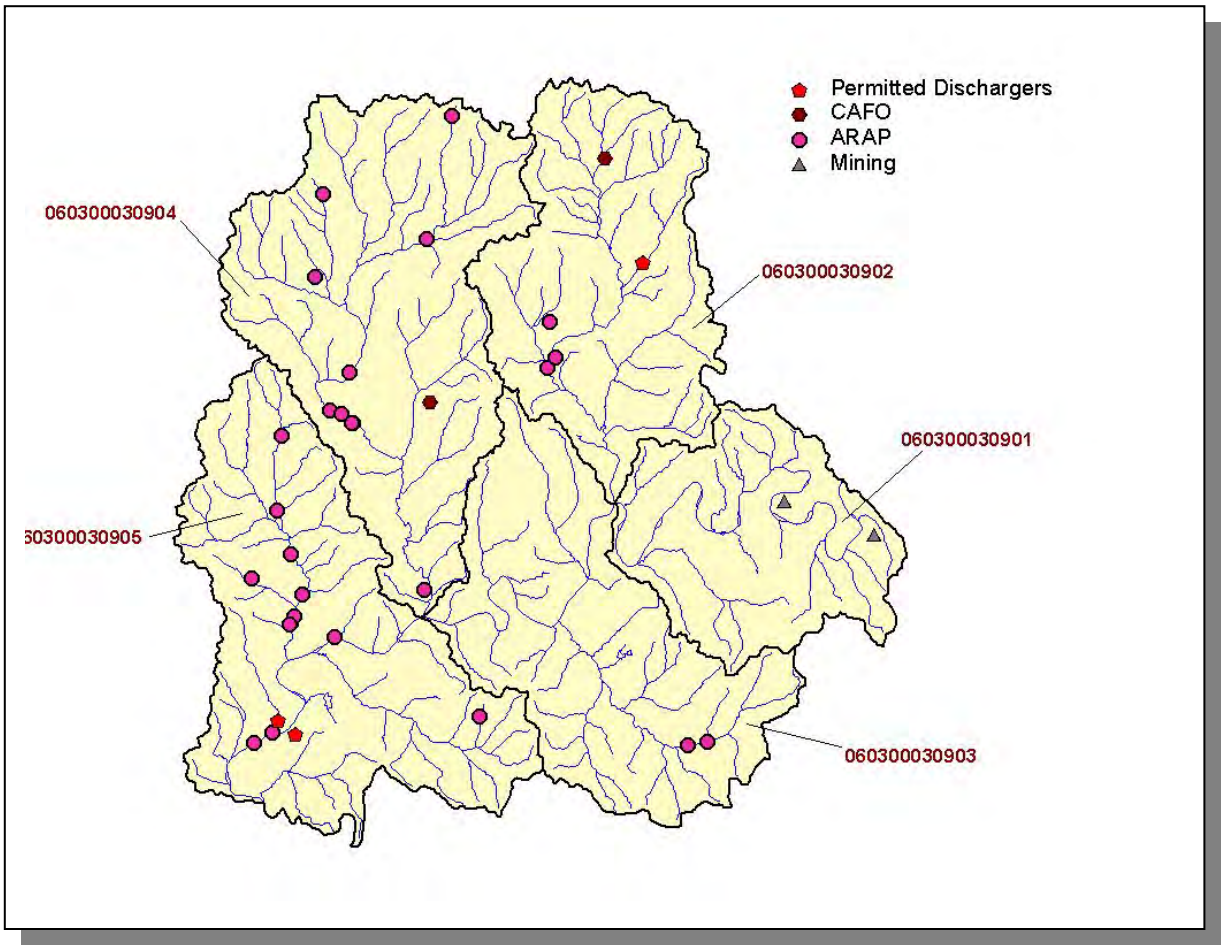

Figure 4-98. Location of Active Point Source Facilities in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. More information is provided in the following charts.*

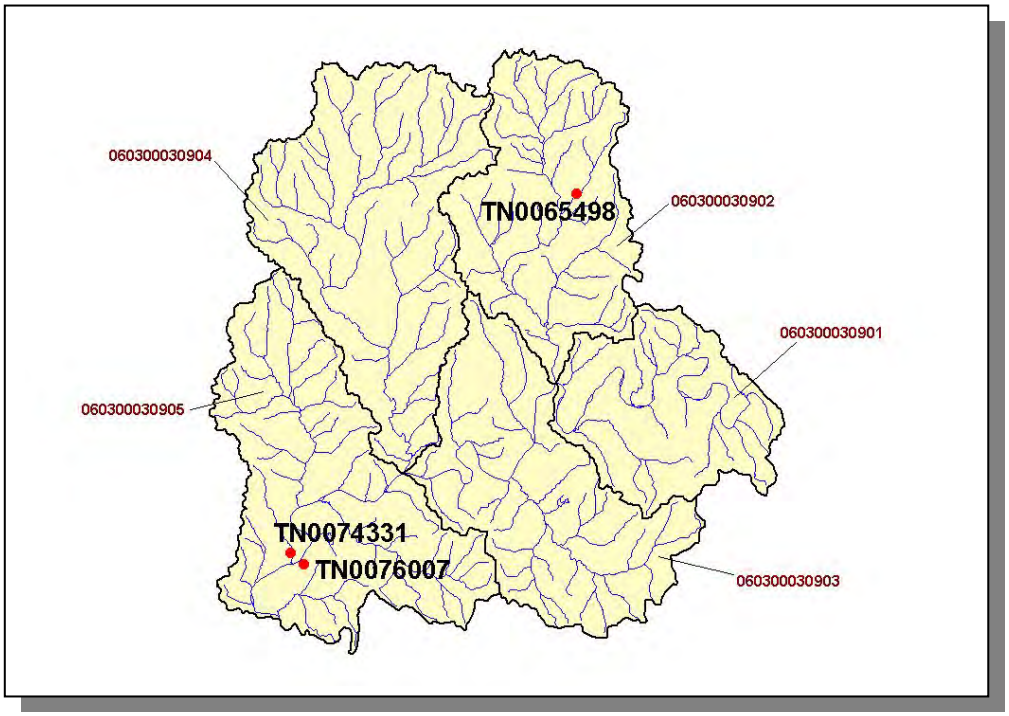

Figure 4-99. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

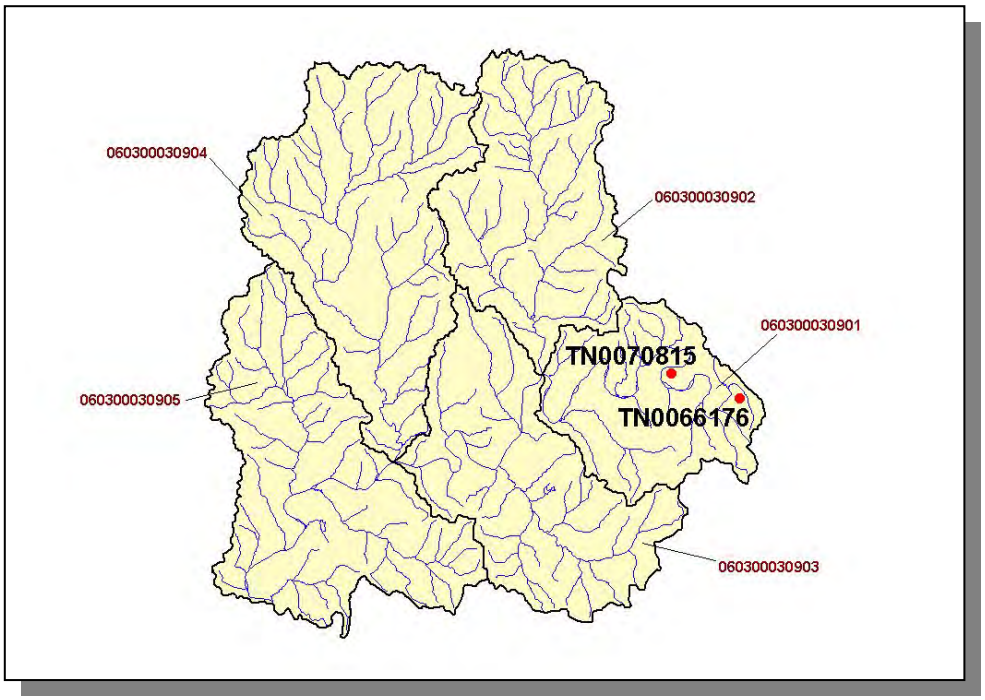

Figure 4-100. Location of Active Mining Sites in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

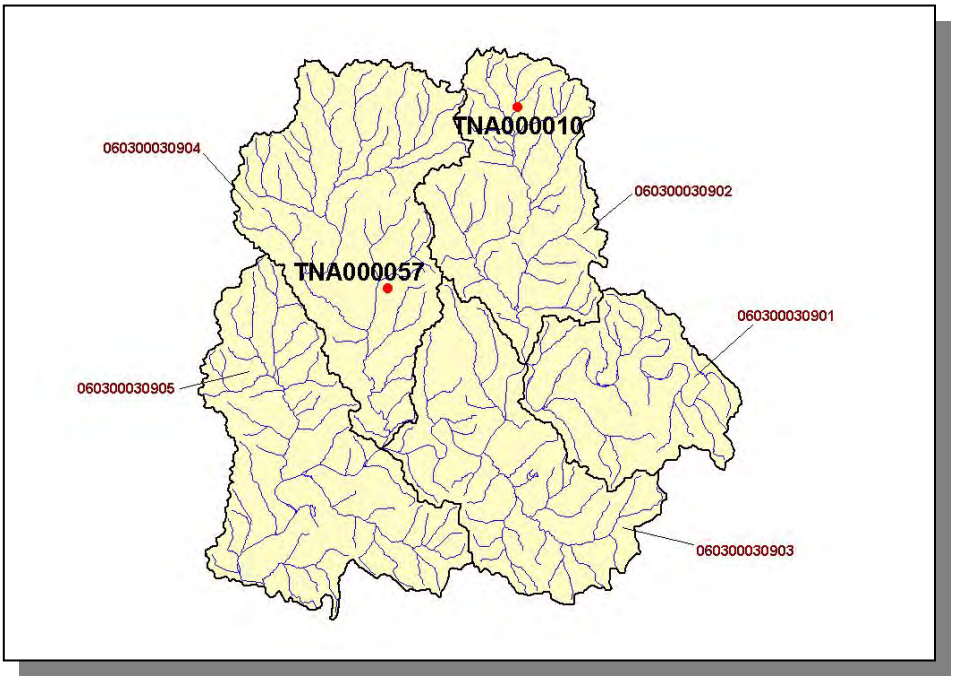

Figure 4-101. Location of CAFO Facilities in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. CAFO rules may be found at http://cfpub.epa.gov/npdes/afo/cafofinalrule.cfm. More information, including the names of facilities, is provided in Upper El-Appendix IV.*

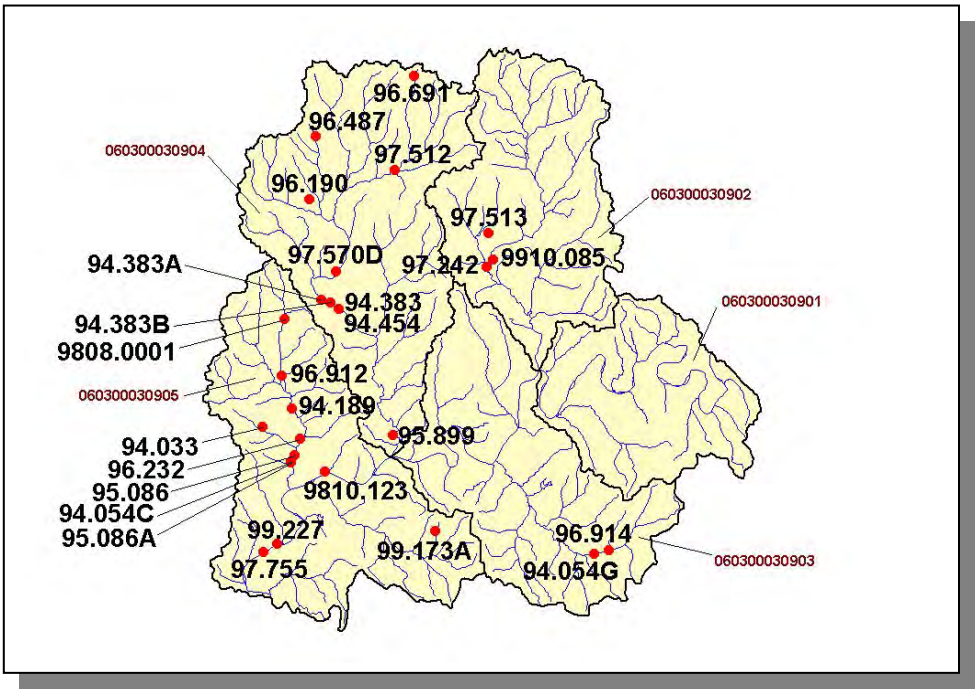

Figure 4-102. Location of ARAP Sites (Individual Permits) in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

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

There is one NPDES facility discharging to water bodies listed on the 1998 303(d) list in Subwatershed 0603000309:

- TN0065498 (Unity Junior High School) discharges to Morton Branch @ RM 1.0

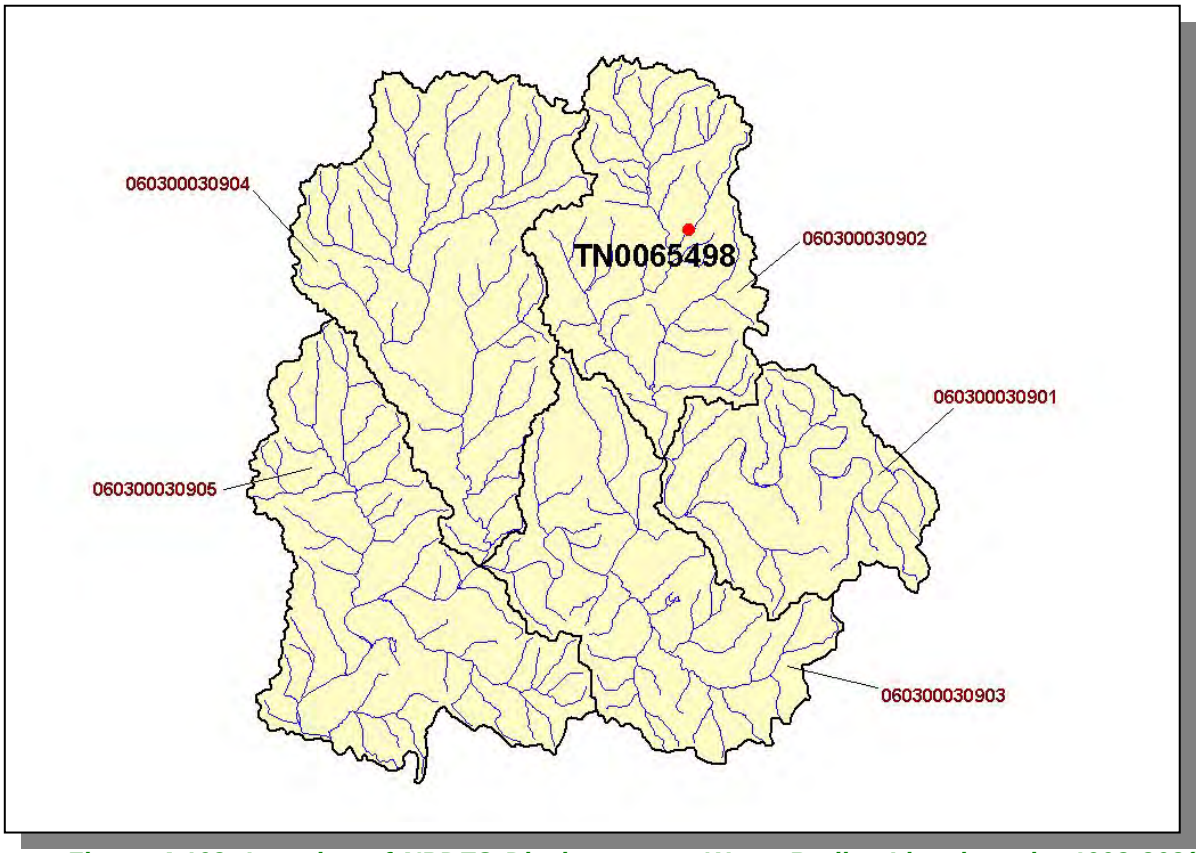

Figure 4-103. Location of NPDES Dischargers to Water Bodies Listed on the 1998 303(d) List in Subwatershed 0603000309. *Subwatershed 060300030901, 060300030902, 060300030903, 060300030904, and 060300030905 boundaries are shown for reference. More information, including the names of facilities, is provided in Upper Elk-Appendix IV.*

PERMIT #	1Q10	3Q10	7Q10	3Q20	QDESIGN
TN0065498			0.00		0.0072

Table 4-57. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000309. *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 #	E. Coli	$CBOD_5$	pH	NH_3	TRC	DO	TSS
TN0065498	X	X	X	X	X	X	X

Table 4-58. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000309. *TCR, Total Residual Chlorine; TSS, Total Suspended Solids.*

PERMIT #	Flow	FECAL COLIFORM
TN0065498	X	X

Table 4-59. Parameters Monitored by NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 0603000309.

4.2.G.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens	Chickens Sold	Hogs	Sheep
20,456	43,843	2,406	49	1,508,236	4,425	260

Table 4-60. Summary of Livestock Count Estimates in Subwatershed 0603000309. *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)
Giles	171.8	171.8	3.3	11.4
Lincoln	136.7	136.7	1.1	3.2
Totals	308.5	308.5	4.4	14.6

Table 4-61. Forest Acreage and Average Removal Rates (1987-1994) in Subwatershed 0603000309.

CROPS	TONS/ACRE/YEAR
Grass (Hayland)	0.22
Legume (Hayland)	0.14
Legume/Grass (Hayland)	0.36
Grass (Pastureland)	1.09
Grass, Forbs, Legumes (Mixed Pasture)	0.89
Forest Land (Grazed)	0.00
Forest Land (Not Grazed)	0.00
Corn (Row Crops)	4.05
Soybeans (Row Crops)	5.89
Tobacco (Row Crops)	9.27
Potatoes (Row Crops)	3.04
All Other Row Crops	2.70
Conservation Reserve Program Land	0.27
Wheat (Close Grown Cropland)	3.02
Barley (Close Grown Cropland)	1.08
Fruit (Horticultural)	0.09
Other Vegetable and Truck Crops	3.09
Summer Fallow (Other Cropland)	1.21
Other Cropland not Planted	0.25
Other Land in Farms	0.27
Nonagricultural Land Use	0.00
Farmsteads and Ranch Headquarters	0.31

Table 4-62. Annual Estimated Total Soil Loss in Subwatershed 0603000309.

CHAPTER 5

WATER QUALITY PARTNERSHIPS IN THE UPPER ELK RIVER WATERSHED

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

- Partnerships between agencies
- Partnerships between agencies and landowners

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

5.2. FEDERAL PARTNERSHIPS.

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

Performance & Results Measurement System (PRMS) is a Web-based database application providing USDA Natural Resources Conservation Service, conservation partners, and the public fast and easy access to accomplishments and progress toward strategies and performance. The PRMS may be viewed at http://prms.nrcs.usda.gov/prms. From the opening menu, select "Reports," then select the Conservation Treatment of interest on the page that comes up. Select the desired location and time period from the drop down menus and choose "Refresh." Choose "by HUC" in the "Location" option and choose "Refresh" again.

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

CONSERVATION PRACTICE	TOTAL
Comprehensive Nutrient Management Plans (Number)	6
Conservation Buffers (Acres)	83
Erosion Reduction (Tons/Year)	19,008
Inventory and Evaluations (Number)	1
Irrigation Management (Acres)	0
Nutrient Management (Acres)	3,497
Pest Management (Acres)	3,319
Prescribed Grazing (Acres)	1,756
Residue Management (Acres)	1,661
Tree and Shrub Practices (Acres)	86
Waste Management (Number)	5
Wetlands Created, Restored, or Enhanced (Acres)	64
Wildlife Habitat (Acres)	817

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

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

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

USGS Water Resources Information on the Internet. Real-time and historical streamflow, water levels, and water-quality data at sites operated by the Tennessee District can be accessed at http://waterdata.usgs.gov/tn/nwis/nwis. Data can be retrieved by county, hydrologic unit code, or major river basin using drop-down menus. Contact Donna Flohr at (615) 837-4730 or dfflohr@usgs.gov for specific information about streamflow data.

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

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

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

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

In 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 is developing 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 will cover 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. Within this watershed, the Service is actively working with landowners to enhance and preserve populations of the Barrens topminnow *(Fundulus julisia)* to help restore this rare fish before it is necessary to list the species as endangered or threatened.

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

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

The Service has completed two projects in the Beans Creek and Bradley Creek watersheds that included the installation of approximately 3,000 feet of livestock exclusion fencing with five associated alternate water sources. Three hardened heavy use areas were also installed to reduce sediment. Another project within the Upper Elk watershed that is pending completion includes the construction of exclusion fencing and an alternative water project. These projects are designed to enhance the habitat of the Barrens topminnow.

How To Participate:

- Interested landowners contact a “Partners for Fish and Wildlife” Biologist to discuss the proposed project and establish a site visit.

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

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

5.2.D. Tennessee Valley Authority (TVA). TVA is encouraging watershed landowners to improve/protect stream riparian zones. Watersheds that are being targeted have streams listed on the 303(d) list. As a partner TVA is supplying fencing and native plants through the NRCS districts to land owners that are willing to create riparian areas along streams that livestock have had free range.

Tims Ford Reservoir Water Quality Improvement Projects. Tims Ford Reservoir is an impoundment that covers a surface area of 10,600 acres at normal summer pool located in the Upper Elk River Watershed. TVA completed Tims Ford Dam on the Elk River in1970 for power generation, recreation, economic development, and flood control. With the completion of the project 246 miles of shoreline were created. TVA is working with reservoir residents to help protect and stabilize the shoreline around Tims Ford through workshops/demonstrations that educate our neighbors about the importance of riparian restoration and protection. Approximately 1.13 shoreline miles in 2002 was put into riparian habitat protection.

Also, TVA completed a shoreline survey that identified 54 miles of critical eroded shoreline on Tims Ford Reservoir in 2001. TVA will be working with partners to stabilize these critical eroded areas and look for funding to work in areas that a partnership is not available. In 2002 TVA partner to stabilize 1000 feet of critical eroded shoreline and in 2003 the plan calls for another 1000 feet to be stabilized.

TVA in partnership with TDEC, TERRM and TWRA leases approximately 800 acres for agriculture use around Tims Ford Reservoir. Agriculture tracts can be used for row crops, hay production and grazing. Starting in 2003 new leaseholders that graze cattle will have to install fencing to keep livestock out of the reservoir and tributaries. All agriculture tracts will be required to maintain a 50-foot riparian buffer.

The National Clean Boating Campaign is a partnership program which highlights the importance of clean water so boating will be fun and safe for future generations. The program demonstrates how boaters can be good stewards of the water environment through best boating and marina practices. Education events have been conducted at the two marinas on Tims Ford Reservoir. Booths have been setup at local community events to hand out literature about clean boating best management practices.

For more information, contact the Tennessee Valley Authority at the TVA information line (1-800-882-5263) or on the web at http://www.tva.com.

5.3. STATE PARTNERSHIPS.

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

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

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

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

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

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

left up to the individual states and local governments without additional authority from Congress for that progression.

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

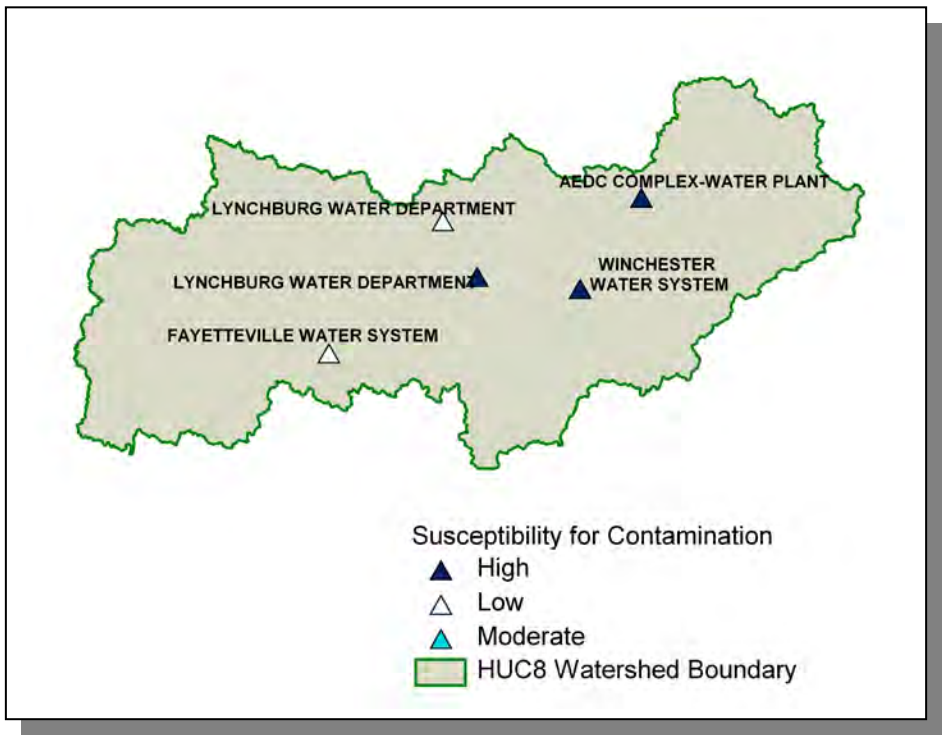

Figure 5-1. Susceptibility for Contamination in the Upper Elk River Watershed.

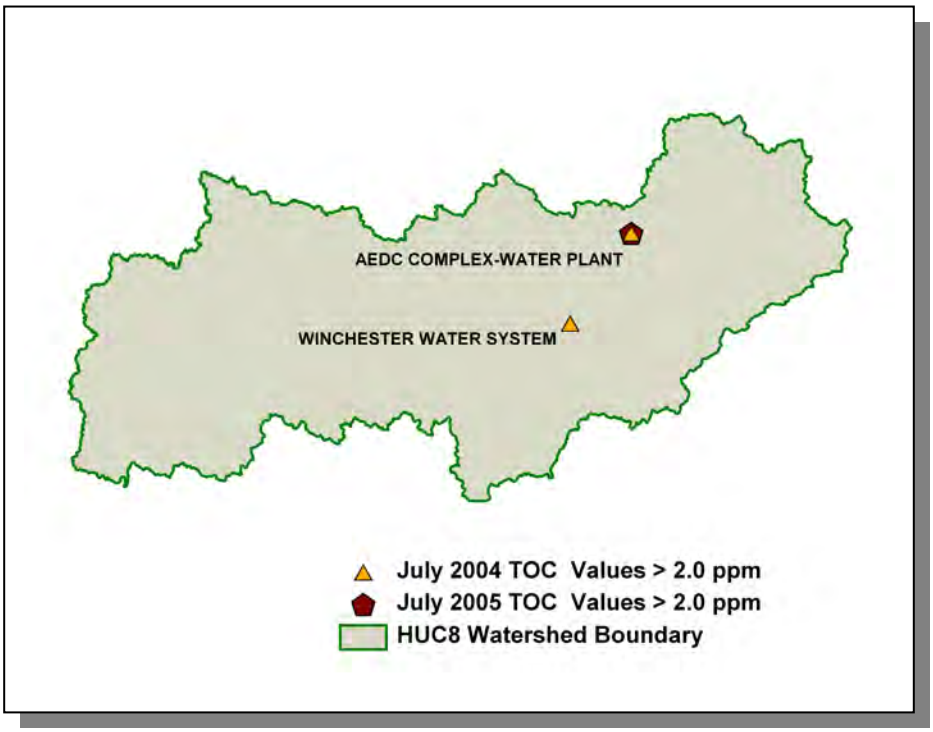

Figure 5-2. July 2004 and 2005 Raw Water Total Organic Carbon (TOC) Analysis in the Upper Elk River Watershed.

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

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

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

SRF loan applicants must pledge security for loan repayment, agree to adjust user rates as needed to cover debt service and fund depreciation, and maintain financial records that follow governmental accounting standards. SRF loan interest rates range from zero

percent to market rate, depending on the community's per-capita income, taxable sales, and taxable property values. Most SRF loan recipients qualify for interest rates between 2 and 4 percent. Interest rates are fixed for the life of the term of the loan. The maximum loan term is 20 years or the design life of the proposed wastewater facility, whichever is shorter.

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

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

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

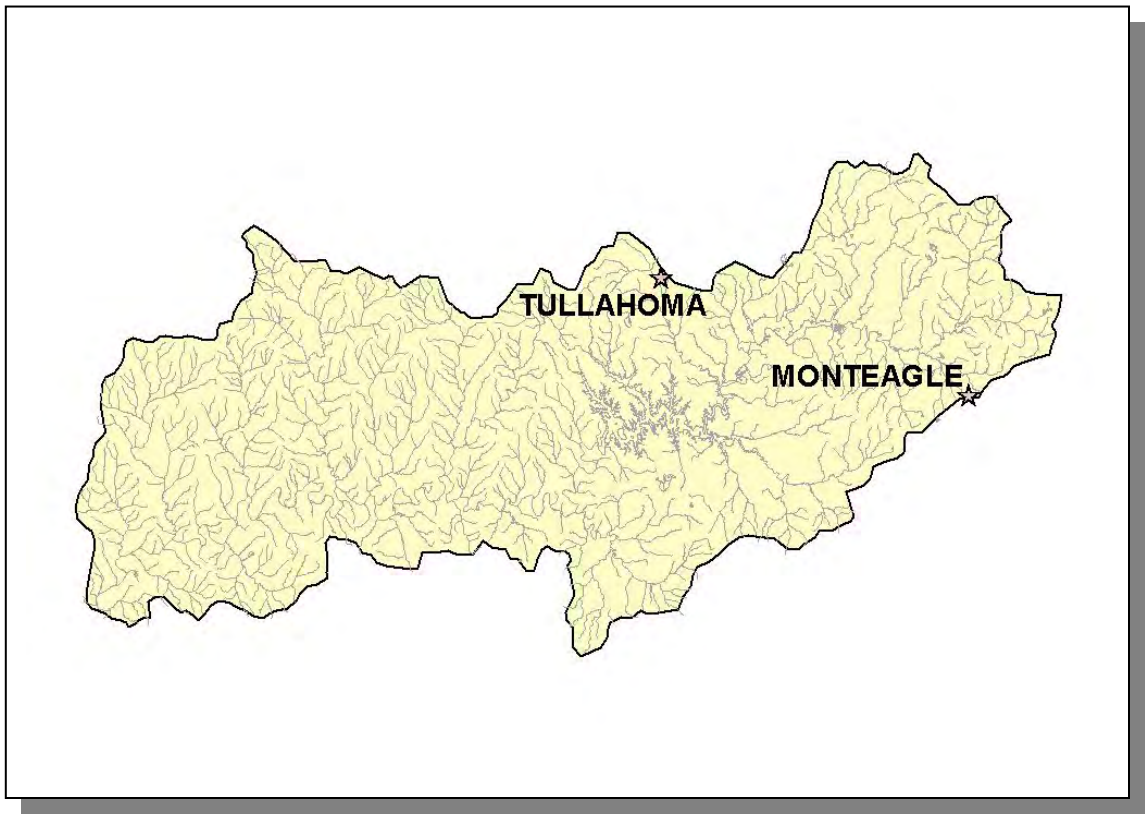

Figure 5-3. Location of Communities Receiving SRF Loans or Grants in the Upper Elk River Watershed. *More information is provided in Upper Elk-Appendix V.*

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

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

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

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

Since January of 1999, the Department of Agriculture and the Department of Environment and Conservation have had a Memorandum of Agreement whereby complaints received by TDEC concerning agriculture or silviculture projects would be forwarded to TDA for investigation and possible correction. Should TDA be unable to obtain correction, they would assist TDEC in the enforcement against the violator. More information about the joint policy to address Bad Actors in forestry operations is available at http://www.state.tn.us/environment/news/release/jan99/badact.htm

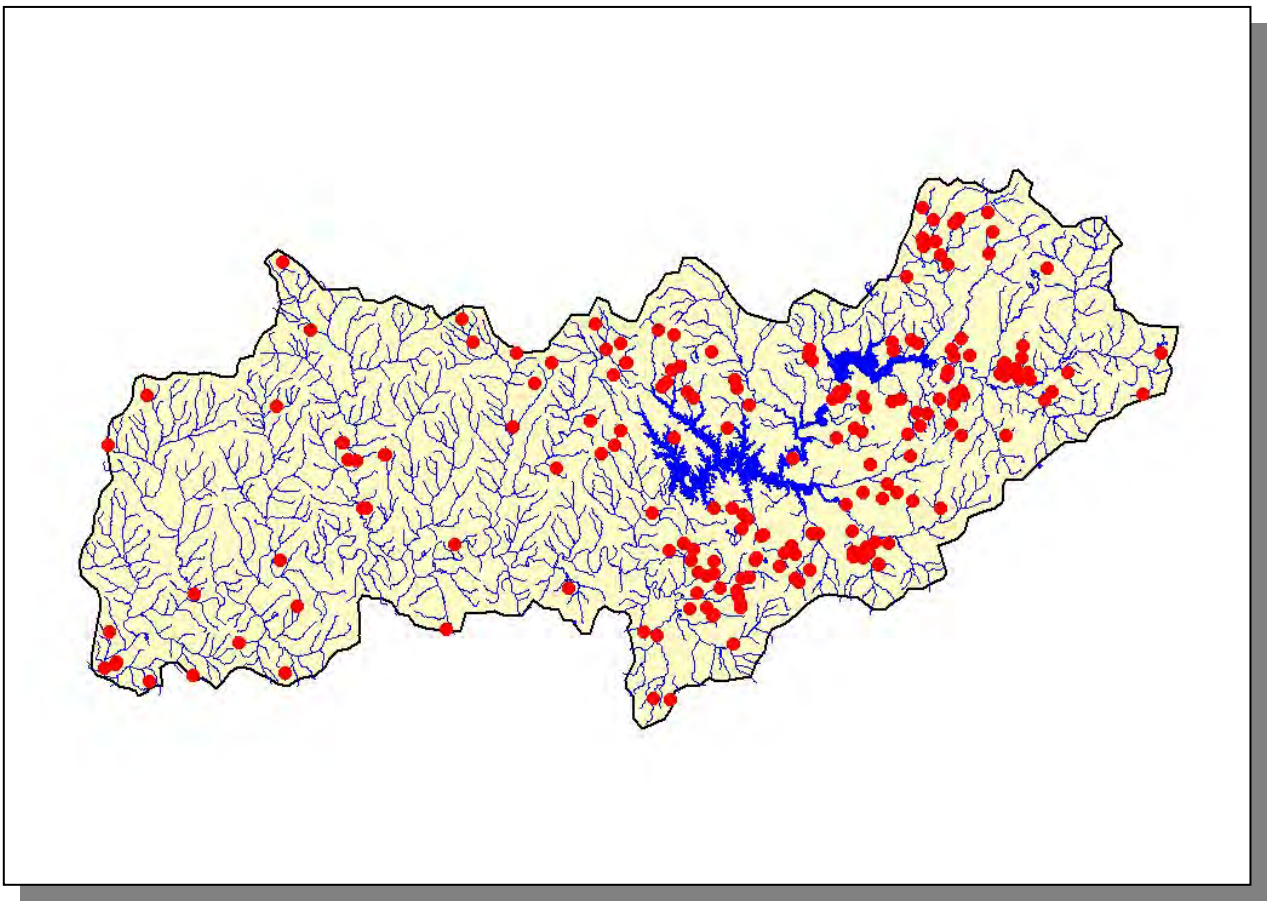

Figure 5-4. Location of BMPs installed from 1999 through 2002 in the Upper Elk River Watershed with Financial Assistance from the Tennessee Department of Agriculture's Nonpoint Source and Agricultural Resources Conservation Fund Grant Programs.

5.4. LOCAL INITIATIVES.

5.4.A. Tims Ford Council (TFC). The objectives of TFC is to: *promote and protect the quality of Tims Ford Reservoir and its shoreline environs; to provide a forum for discussion, education and appropriate action concerning reservoir issues and activities; and to maintain active liaison with appropriate federal, state and local authorities, departments and agencies.* Membership in the Council is open to individuals or entities who endorse the above objectives. We have been active for over 10 years and have a current membership of 256 families. TFC publishes an annual newsletter, and maintains a web site to publicize our activities and accomplishments.

A Committee or Special Interest Group is formed to work any issue that the membership feels important. Current committees include:

- Tims Ford Reservoir Water Quality. In the past, this group has helped identify sewage collection system leaks, establish liaison with Winchester Utilities, TVA and TDEC. Currently staffed with over 25 members. This group is broken into 4 teams that take water samples from 6 locations around the lake. These samples are analyzed by the teams for temperature, acidity (pH), visibility, nitrate, phosphate, dissolved oxygen, alkalinity and bacterial pollutants. The results are shared with local water utilities, TVA and TDEC.
- Lake Clean Up. Held annually in cooperation with local civic organizations, this activity has removed 4 to 6 tons of waste materials from the lake each spring.
- Clean Boating Campaign. Co-Sponsored with TVA; we help advertise and recruit boaters to help make the lake a better place.
- Water Safety education and support of required boat safety training.
- Liaison with Winchester Utilities, TVA, TDEC and TF State Park.

Past issues and committees included:

- Property Tax Committee, providing citizens with information and procedures for seeking relief from high property taxes.
- Reducing Property Taxes for Senior Citizens, lobbying the Tennessee Legislature to provide Senior Citizens with a reduction in property tax.
- Provide a forum for candidates for county office to speak to Lake Issues.

Points of contact for issues related to the Tims Ford Reservoir include:

- Ronald Schmitz, Chairman (chairman@timsfordcouncil.com)
- Bill Riehl, Leader, Water Quality Issues (theriehl@aol.com)
- Monte Miller, Board Member (montemiller@timsfordcouncil.com)

The TFC web page can be found at http://www.timsfordcouncil.com/

CHAPTER 6

FUTURE DIRECTIONS IN THE UPPER ELK RIVER WATERSHED

6.1. BACKGROUND.

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

In addition to the NPDES program, some state and federal regulations, such as the TMDL and ARAP programs, address point and nonpoint issues. Construction and MS4 stormwater rules (implemented under the NPDES program) are transitioning from Phase 1 to Phase 2. More information on stormwatrer 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 Upper Elk River Watershed as well as specific NPDES permittee information.

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

6.2.A. Year 1 Public Meeting. The first Upper Elk River Watershed public meeting was held April 22, 1997 in Winchester. 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.

6.2.B. Year 3 Public Meeting. The second Upper Elk River Watershed public meeting was held October 26, 1999 at the Winchester 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.

6.2.C. Year 5 Public Meeting. The third scheduled Upper Elk River Watershed public meeting was held November 3, 2003 at the Winchester Courthouse. 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
- Tennessee Valley Authority display

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

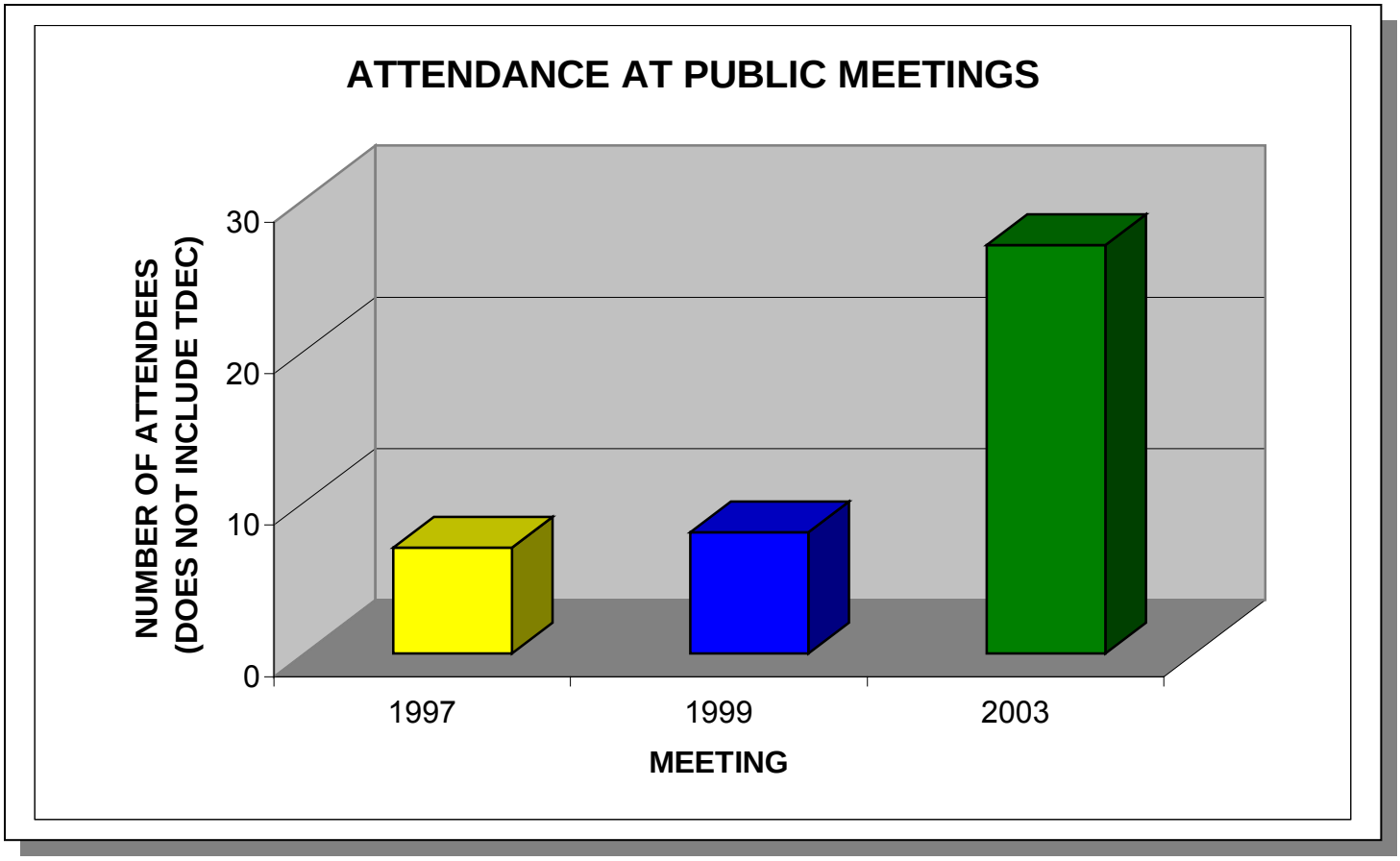

Figure 6-1. Attendance at Public Meetings in the Upper Elk River Watershed. *The 1997 and 1999 watershed meeting numbers represent Upper Elk River, Lower Elk River, Pickwick Lake, and Wheeler Lake, Watershed joint meetings.*

Figure 6-2. Informal discussions are important in meeting citizens' interest in understanding Water Pollution Control's activities in the watershed, and in communicating to the Department any concerns they might have.

Figure 6-3. Partners, like the Tennessee Valley Authority, are important in the watershed approach, and use the watershed meetings to communicate their activities to the public.

6.3. APPROACHES USED.

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

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

TMDLs are prioritized for development based on many factors.

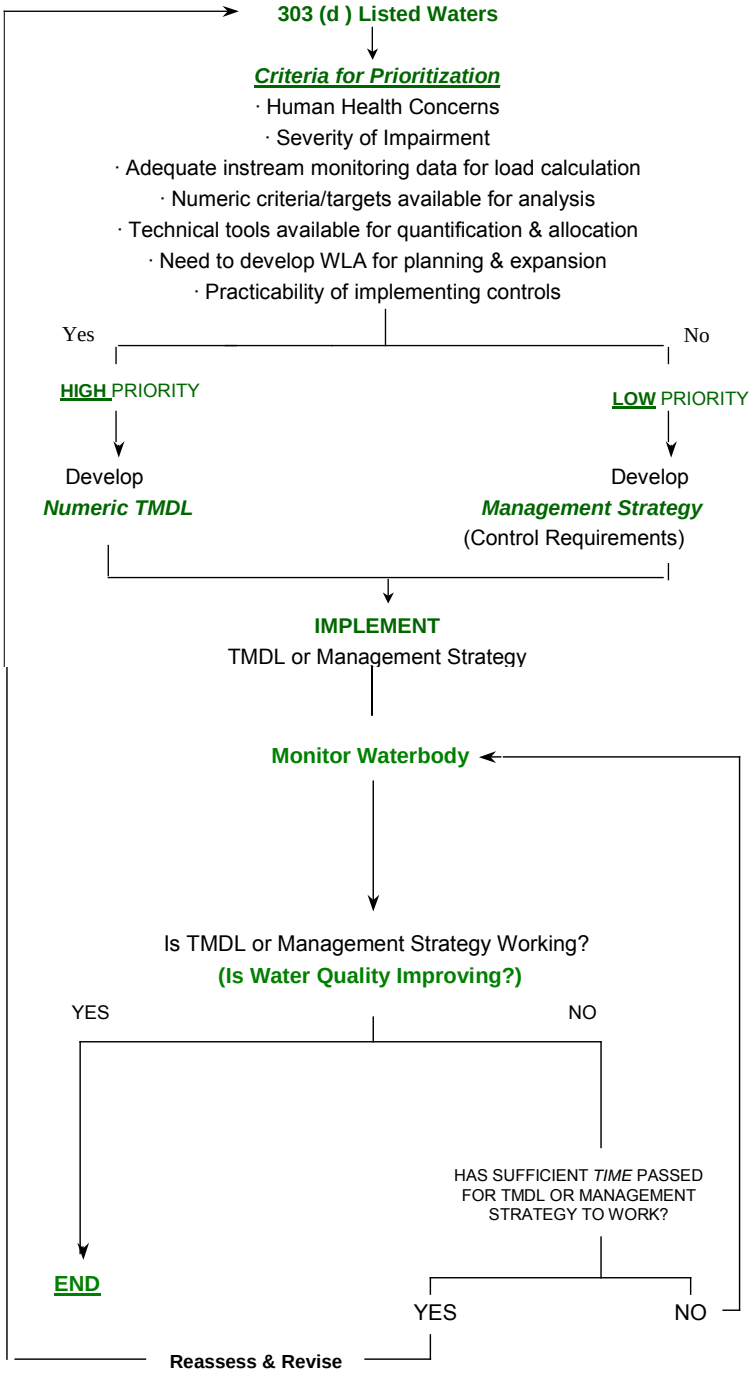

Figure 6-4. Prioritization scheme for TMDL Development.

6.3.B. Nonpoint Sources

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

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

The following text describes certain types of impairments, causes, suggested improvement measures, and control strategies. The suggested measures and streams are only examples and efforts should not be limited to only those streams and measures mentioned.

6.3.B.i. Sedimentation.

6.3.B.i.a. From Construction Sites. Construction activities have historically been considered “nonpoint sources.” In the late 1980’s, EPA designated them as being subject to NPDES regulation if more than 5 acres are disturbed. In the spring of 2003, that threshold became 1 acre. The general permit issued for such construction sites sets out conditions for maintenance of the sites to minimize pollution from stormwater runoff, including requirements for installation and inspection of erosion controls. Also, the general permit imposes more stringent inspection and self-monitoring requirements on sites in the watershed of streams that are already impaired due to sedimentation. 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. Historically, construction activities have not been a large source of the sediment problems within the Upper Elk River Watershed, due to the rather sparsely populated nature of most of the watershed. However, increased population growth in the urban centers of Fayetteville, Tullahoma, and Winchester/Decherd (among others) will require local regulation and oversight to prevent construction runoff from impacting area streams.

6.3.B.i.b. From Channel and/or Bank Erosion. Many streams in the Upper Elk River Watershed suffer from varying degrees of stream bank erosion. When stream channels are altered, or large tracts of land are cleared, increasing storm runoff, banks can

become unstable and highly erodable. Heavy livestock traffic can also severely disturb stream banks. Destabilized banks contribute to sediment loading and accelerate the loss of riparian vegetation. This cycle is especially problematic in the headwater areas of the Upper Elk River Watershed, where the very sandy plateau soils and shallow rooted trees are especially vulnerable. Most of the land and channel alterations center on agricultural practices, including row-cropping too close to the stream and livestock grazing.

Several agencies such as the Natural Resources Conservation Service (NRCS) and the Tennessee Department of Agriculture (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 could benefit from these types of projects, including Stewart Creek, Pleasant Valley Creek, Little Swan Creek, Farris Creek, and West Cane Creek. Other methods or controls that might be necessary to address common problems are:

Voluntary activities

- Re-establishment of bank vegetation (examples: Coffee Creek, Robinson Creek, Little Cane Creek, Stephens Creek, and many others).
- Establish buffer zones along streams running through row crop fields or nurseries (examples: Blue Spring Creek, Gum Creek, Hessey Branch).
- Establish off-channel watering areas for cattle by moving watering troughs and feeders back from stream banks (examples: Short Creek, Shelton Creek, and Indian Creek).
- Limit cattle access to streams and bank vegetation (examples: Mud Creek, Yellow Branch, and Childer Creek).

Additional strategies

- Better community planning for the impacts of development on small streams, especially development in growing areas (examples: small streams in and around Tullahoma, Winchester, and Fayetteville).
- Restrictions requiring post construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion (examples: Wagner Creek, Blue Creek, and Rock Creek).
- Additional restrictions on logging in streamside management zones.
- Prohibition on clearing of stream and ditch banks (example: Gum Creek). *Note: Permits may be required for any work along streams.*
- Additional restriction to road and utilities crossings of streams.
- Restrictions on the use of off-highway vehicles on stream banks and in stream channels.

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

The Master Logger Program has been in place for several years to train loggers how to plan their logging activities and to install Best Management Practices that lessen the impact of logging activities. Recently, laws and regulations were enacted which established the expected BMPs to be used and allows the Commissioners of the

Departments of Environment and Conservation and of Agriculture to stop a logging operation that has failed to install these BMPs and so are impacting streams. Only the headwater area of the Elk River on the plateau retains large tracts of forested land which have the potential to be affected by larger-scale logging operations.

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. Agriculture is the most widespread land-use in the Upper Elk River Watershed, therefore impacting the greatest number of stream miles.

6.3.B.ii. Pathogen Contamination.

Possible sources of pathogens are inadequate or failing septic tank systems, overflows or breaks in public sewer collection systems, poorly disinfected discharges from sewage treatment plants, and fecal matter in streams and storm drains due to pets, livestock and wildlife. Permits issued by the Division of Water Pollution Control regulate discharges from point sources and require adequate control for these sources. Individual homes are required to have subsurface, on-site treatment (i.e., septic tank and field lines) if public sewers are not available. Septic tank and field lines are regulated by the Division of Ground Water Protection within the Columbia Environmental Assistance Center and delegated county health departments. In addition to discharges to surface waters, businesses may employ either subsurface or surface disposal of wastewater. The Division of Water Pollution Control regulates surface disposal.

Currently, only three stream systems in the Upper Elk River Watershed are known to have excessive pathogen contamination (however, many streams have not been screened). These are Juanita Creek (Grundy County), and Cane Creek and Swan Creek (Lincoln County). Juanita Creek is in a small urban area, with its bacterial contamination coming from stormwater runoff, failing septic systems, and sewage collection system leaks. Cane Creek and Swan Creek are in agricultural areas, with large livestock operations generating great quantities of manure. Measures that may be necessary to control pathogens in these streams, and in others with less serious problems, include:

Voluntary activities

- Limiting livestock access to streams, including use of off-channel watering of livestock (example: Cane Creek).
- Proper management of animal waste from feeding operations (example: Swan Creek).
- Better maintenance of sub-surface disposal systems.

Enforcement strategies

- Greater enforcement of regulations governing on-site wastewater treatment.
- Timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.

- Identification of Concentrated Animal Feeding Operations not currently permitted, and enforcement of current regulations.

Additional strategies

- Restrict development in areas where sewer is not available and treatment by subsurface disposal is not an option due to poor soils, floodplains, or high water tables. This is particularly important in the headwaters of the Elk River Watershed, given the geology of the Cumberland Plateau and Escarpment.
- Develop and enforce leash laws and controls on pet fecal material in areas with higher population densities.
- Greater efforts by sewer utilities to identify leaking lines or overflowing manholes, (example: Juanita Creek).
- More efforts by local urban public works and utilities to identify and control contaminated stormwater runoff sources entering storm sewer systems.

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 inappropriate sewage disposal practices.

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. Caney Hollow Creek, Factory Branch, Farris Creek, Dry Creek, and many others could benefit from buffer zones that filter nutrient runoff.
- 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 canopy removal. An intact riparian zone also acts as a buffer to filter out nutrient loads before they enter the water.

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

Regulatory Strategies

- Greater enforcement of regulations governing on-site wastewater treatment.
- More stringent permit limits for nutrients discharged from sewage treatment plants (including Rock Creek and East Fork Mulberry Creek).
- Timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.
- Identification of Concentrated Animal Feeding Operations not currently permitted, and enforcement of current regulations.

6.3.B.iv. Toxins and Other Materials.

Although some toxic substances are discharged directly into streams from a point source, much of these materials are washed in during rainfalls from an upland location or via improper waste disposal practices that contaminate groundwater. In the Upper Elk River Watershed, a relatively small number of streams are damaged by stormwater runoff from industrial areas or urban areas. More stringent inspection and regulation of permitted industrial activities, and local stormwater quality initiatives and regulations, could help reduce the amount of contaminated runoff reaching state waters. Examples of streams that would benefit from these measures include Wagner Creek, Rock Creek, and Blue Creek.

Woods Reservoir represents a particularly large-scale example of toxic releases into streams. Due to decades of PCBs being discharged into this impoundment of the Elk River, the bottom sediment has become highly contaminated, and the lake is now posted for fish consumption due to this legacy pollutant.

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 can be addressed by:

Voluntary activities

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

Needing regulation

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

6.3.B.v. Habitat Alteration.

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

Measures that can help address this problem are:

Voluntary activities

- Organizing stream cleanups removing trash, limbs and debris before they cause blockage.
- Avoiding use of heavy equipment to "clean out" streams.
- Planting vegetation along streams to stabilize banks and provide habitat (nearly all streams could benefit from this).
- Encouraging developers to avoid extensive culverts in streams.

Current regulations

- Restrict modification of streams by such means as culverting, lining, or impounding.
- Require off-site mitigation for impacts to streams and wetlands when modifications are allowed. Like most large dams, Tims Ford Dam and Woods Reservoir Dam have chronically caused serious impacts to the Elk River from low oxygen levels as well as unnatural thermal and flow alterations in the downstream tailwaters.

Additional Enforcement

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

In addition, there are three streams in the Upper Elk River Watershed that have been impacted due to unnatural flow and thermal alterations caused by permitted dischargers. The batch discharge system at the Tullahoma Sewage Treatment Plant has degraded Rock Creek, and some discharges from AEDC have impacted Rollins Branch and Rowlands Creek. New technology and facility design at these two facilities may be necessary to mitigate the long-standing negative effects produced by operations at these sites.

6.4. PERMIT REISSUANCE PLANNING

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

The following three sections provide specific information on municipal, industrial, and water treatment plant active permit holders in the Upper Elk River Watershed. Compliance information was obtained from EPA's Permit Compliance System (PCS). All data was queried for a five-year period between January 1, 2001 and December 31, 2006. PCS can be accessed publicly through EPA's Envirofacts website. This website provides access to several EPA databases to provide the public with information about environmental activities that may affect air, water, and land anywhere in the United States:

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

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

6.4.A. Municipal Permits

TN0021806 Monteagle Sewage Treatment Plant, Plant #1

Discharger rating: Major
City: Monteagle
County: Grundy
EFO Name: Chattanooga
Issuance Date: 8/30/02
Expiration Date: 8/30/07
Receiving Stream(s): Mile 1.3 tributary to Gilliam Creek at mile 1.6 to Caldwell Creek at mile 1.5
HUC-12: 060300030103
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: WAS to aerobic dig to dry beds or to land application

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	2	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	3.1	lb/day	DMax Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.5	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	2.1	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	3	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2.3	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	3.1	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	1.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	4.8	lb/day	DMax Load	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Summer	30	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	Summer	52	lb/day	DMax Load	3/Week	Composite	Effluent
CBOD5	Summer	20	mg/L	DMin Conc	3/Week	Composite	Effluent
CBOD5	Summer	42	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	Summer	25	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	Winter	40	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	Winter	73	lb/day	DMax Load	3/Week	Composite	Effluent
CBOD5	Winter	52	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	Winter	35	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	Winter	25	mg/L	DMin Conc	3/Week	Composite	Effluent
D.O.	All Year	5	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent

Table 6-1a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	83	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	63	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-1b.

Tables 6-1a –b. Permit Limits Monteagle Sewage Treatment Plant #1.

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

- 1 Settleable Solids
- 7 Ammonia
- 2 CBOD
- 2 Fecal Coliform
- 12 Suspended Solids % Removal
- 1 Chlorine
- 25 bypasses
- 12 overflows

Enforcement:
Commissioner's Order #04-0625
Database notes:
City of Monteagle is a municipality in Grundy County, Tennessee that owns and operates two wastewater treatment plants (WWT plants #1 and #2) and associated sewage collection systems. On November 20, 2002, the Water Quality Control Board

issued Agreed Order #02-0192 to the Respondent to resolve two previous Director's Orders (#01-0168D, #01-065D) for effluent violations. Follow-up compliance evaluation inspections at plants #1 and #2 revealed conditions in violation of permit parameters, persistent operational deficiencies, and failure to comply with the terms of the Agreed Order. Accumulation of waste sludge resulting from improper operation of plant #2 was observed in Trussel Creek and its tributary.
01/11/06 Agreed Order entered by the Secretary of State.
05/10/06 Requested an extension on the SORP until 5/22/06.
06/16/06 The Trussell Creek mitigation plan. Steps 1,2,4, &5 were acceptable. Step 3 was denied. Step 3 proposed to build a retention pond in Trusseell Creek.
10/3/06 Approval of sewer connections granted.
10/31/06 Letter sent from the permit section requesting additional samples as required by permit before the permit can be modified.

EFO Comments:
None.

TN0064815 Monteagle Sewage Treatment Plant, Plant #2

Discharger rating: Major
City: Monteagle
County: Grundy
EFO Name: Chattanooga
Issuance Date: 10/29/04
Expiration Date: 11/30/07
Receiving Stream(s): Unnamed tributary at mile 1.0 to Trussel Creek
HUC-12: 060300030103
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Secondary with trickling filter, submerged bed nitrification, clarification, chlorination, dechlorination and step aeration, and aerobic sludge digester

Segment	TN06030003044_0730
Name	Trussel Creek
Size	4.3
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Livestock Watering and Wildlife (Supporting), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Recreation (Not Assessed)
Causes	Solids (Suspended/Bedload), Nutrient/Eutrophication Biological Indicators, 461, Oxygen, Dissolved
Sources	Municipal Point Source Discharges

Table 6-2. Stream Segment Information for Monteagle Sewage Treatment Plant, Plant #2.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	4	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.24	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	3	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	2.6	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	6	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	10	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	16	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	7.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2.36	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	4.9	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	All Year	40	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	73	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	35	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	52	lb/day	MAvg Load	3/Week	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent

Table 6-3a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
E. coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Conc	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
NOEL 7day Ceriodaphnia Dubia	All Year	100	Percent	MAvg Min	Quarterly	Calculated	Effluent
NOEL 7day Fathead Minnows	All Year	100	Percent	MAvg Min	Quarterly	Calculated	Effluent
Nitrogen Total (as N)	All Year	5	mg/L	MAvg Conc	Bi-monthly	Composite	Effluent
Phosporus, Dissolved	All Year		mg/L	MAvg Conc	Bi-monthly	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	83	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	83	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-3b.

Tables 6-3a-b. Permit Limits for Monteagle Sewage Treatment Plant, Plant #2.

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

- 21 Ammonia
- 3 COD
- 4 Suspended Solids % Removal

Enforcement:
Commissioner's Order #04-0625
Database notes:
City of Monteagle is a municipality in Grundy County, Tennessee that owns and operates two wastewater treatment plants (WWT plants; plants #1 and #2) and associated sewage collection systems. On November 20, 2002, the Water Quality Control Board issued Agreed Order #02-0192 to the Respondent to resolve two previous Director's Orders (#01-0168D, #01-065D) for effluent violations. Follow-up compliance evaluation inspections at plants #1 and #2 revealed conditions in violation of permit parameters, persistent operational deficiencies, and failure to comply with the terms of the Agreed Order. Accumulation of waste sludge resulting from improper operation of plant #2 was observed in Trussel Creek and its tributary.
01/11/06 Agreed Order entered by the Secretary of State.
05/10/06 Requested an extension on the SORP until 5/22/06.

06/16/06 The Trussell Creek mitigation plan. Steps 1,2,4, &5 were acceptable. Step 3 was denied. Step 3 proposed to build a retention pond in Trusseell Creek.
10/3/06 Approval of sewer connections granted by Dick Urban.
10/31/06 Letter sent from the permit section requesting additional samples as required by permit before the permit can be modified.

EFO Comments:
None.

TN0020508 Decherd Water Works Sewage Treatment Plant

Discharger rating: Major
City: Decherd
County: Franklin
EFO Name: Columbia
Issuance Date: 6/30/04
Expiration Date: 7/31/07
Receiving Stream(s): Wagner Creek at mile 2.4
HUC-12: 060300030401
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Expansion of municipal treatment capacity discharging to Outfall 001from 0.5 to 1.0 MGD

Segment	TN06030003032_1000
Name	Wagner Creek
Size	18.8
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Nitrates, Physical substrate habitat alterations, Escherichia coli
Sources	Municipal (Urbanized High Density Area), Municipal Point Source Discharges, Channelization

Table 6-4. Stream Segment Information for Decherd Sewage Treatment Plant, Plant #2.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	2.4	MGD	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	2.4	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.2	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	5	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.8	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.8	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	9.2	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.1	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	7.5	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	15	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	5	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	17.5	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	8.3	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2.1	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	5	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	3.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	29.2	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	14.6	lb/day	WAvg Load	3/Week	Composite	Effluent

Table 6-5a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Winter	35	mg/L	WAvg Conc	3/Week	Composite	Effluent
Bypass of Treatment (flow rate)	All Year		Visual	MAvg Conc	Monthly		Effluent
Bypass of Treatment (flow rate)	All Year		Visual	MAvg Load	Monthly		Effluent
CBOD % Removal	All Year	40	Percent	MAvg % Removal	3/Week	Calculated	Effluent
CBOD % Removal	All Year	40	Percent	MAvg % Removal	3/Week	Calculated	Effluent
CBOD5	All Year	85	Percent	MAvg Min	Monthly	Composite	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	10	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	125	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	63	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	15	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	15	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	83	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	42	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	10	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	20	mg/L	DMax Conc	3/Week	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Conc	3/Week	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Conc	Daily	Composite	Effluent
Flow	All Year		MGD	DMax Conc	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Conc	Daily	Composite	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Conc	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Conc	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Conc	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Conc	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Conc	Daily	Composite	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Quarterly	Composite	Effluent
Nitrogen Total (as N)	All Year		mg/L	DMax Conc	2/Month	Composite	Effluent
Nitrogen Total (as N)	All Year		mg/L	MAvg Conc	2/Month	Composite	Effluent
Nitrogen Total (as N)	Summer		mg/L	DMax Conc	2/Week	Composite	Effluent
Nitrogen Total (as N)	Summer	11	mg/L	MAvg Conc	2/Week	Composite	Effluent
Nitrogen Total (as N)	Summer	91.7	lb/day	MAvg Load	2/Week	Composite	Effluent

Table 6-5b.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Overflow Use Occurences	All Year		Occurences/Month	DMax Load	Continuous	Visual	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Effluent
Overflow Use Occurences	All Year		Occurences/Month	DMax Load	Continuous	Visual	Effluent
Phosphorus Total	All Year		mg/L	DMax Conc	2/Month	Composite	Effluent
Phosphorus Total	All Year		mg/L	MAvg Conc	2/Month	Composite	Effluent
Phosphorus Total	Summer		lb/day	DMax Conc	2/Week	Composite	Effluent
Phosphorus Total	Summer	0.5	mg/L	MAvg Conc	2/Week	Composite	Effluent
Phosphorus Total	Summer	4.2	lb/day	MAvg Load	2/Week	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Grab	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	334	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	167	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	250	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	125	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS % Removal	All Year	85	Percent	MAvg % Removal	Monthly	Calculated	%Removal
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	%Removal
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	%Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-5c.

Tables 6-5a-c. Permit Limits for Decherd Sewage Treatment Plant.

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

- 2 Total Nitrogen
- 2 Settleable Solids
- 1 Total Phosphorus
- 1 Suspended Solids % Removal.
- 7 Overflows
- 21 Bypasses

EFO Comments:
None.

TN0025101 Lynchburg Sewage Treatment Plant

Discharger rating: Minor
City: Lynchburg
County: Moore
EFO Name: Columbia
Issuance Date: 3/31/06
Expiration Date: 5/31/08
Receiving Stream(s): East Fork Mulberry Creek at mile 11.1
HUC-12: 060300030701
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Extended Aeration

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	7.8	lb/day	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	3.9	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	5.8	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	9.7	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	14.5	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	14	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	26	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	7	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	17	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	10.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	All Year	40	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	88	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	35	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	63	lb/day	MAvg Load	3/Week	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Conc	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Conc	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Conc	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Conc	Daily	Continuous	Influent (Raw Sewage)
IC25 7day Ceriodaphnia Dubia	All Year	35.25	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	35.25	Percent	DMin Conc	Quarterly	Composite	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather

Table 6-6a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Grab	Effluent
TRC	All Year	0.05	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	75	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	100	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-6b.

Tables 6-6a-b. Permit Limits for Lynchburg Sewage Treatment Plant.

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

- 25 TSS
- 29 Ammonia
- 11 CBOD
- 50 Overflows
- 2 Bypasses

EFO Comments:
None – need to check with Nashville EFO.

TN0027766 TDEC Tims Ford State Park

Discharger rating: Major
City: Winchester
County: Franklin
EFO Name: Columbia
Issuance Date: 2/28/02
Expiration Date: 2/28/02
Receiving Stream(s): Elk River at mile 136.2
HUC-12: 060300030301
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Holding tank to hauler to Tims Ford State Park/ Extended aeration

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	5	mg/L	DMin Conc	Weekdays	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	1	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-7. Permit Limits for Tims Ford State Park.

EFO Comments:
No Issues.

TN0021644 Cowan Sewage Treatment Plant

Discharger rating: Minor
City: Cowan
County: Franklin
EFO Name: Columbia
Issuance Date: 6/28/02
Expiration Date: 5/29/07
Receiving Stream(s): Boiling Fork Creek at mile 13.4
HUC-12: 060300030403
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Oxidation ditch activated sludge plant with chlorination/dechlorination

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	3	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	6.7	lb/day	DMax Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	2	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	5	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	4	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	3	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	6.7	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	2	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	10	lb/day	DMax Load	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	All Year	25	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year	10	mg/L	DMin Conc	3/Week	Composite	Effluent
CBOD5	All Year	50	lb/day	DMax Load	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	15	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	33.4	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)

Table 6-8a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	0.03	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	133	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	100	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-8b.

Tables 6-8a-b. Permit Limits for Cowan Sewage Treatment Plant

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

- 1 Ammonia
- 1 Overflow

EFO Comments:
No issues.

TN0021814 Fayetteville Sewage Treatment Plant

Discharger rating: Major
City: Fayetteville
County: Lincoln
EFO Name: Columbia
Issuance Date: 1/31/02
Expiration Date: 1/31/07
Receiving Stream(s): Elk River Mile 90.0
HUC-12: 060300030505
Effluent Summary: Treated municipal and industrial wastewater
Treatment system: WAS to aerobic dig to land application 80%; 20% to dry beds to land application

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
BOD % removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
BOD % removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
BOD5	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
BOD5	All Year	1118	lb/day	DMax Load	3/Week	Composite	Effluent
BOD5	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
BOD5	All Year	838	lb/day	MAvg Load	3/Week	Composite	Effluent
BOD5	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	5.4	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	5.4	Percent	DMin Conc	Quarterly	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	0.4	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	838	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	1118	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-9. Permit Limits for Fayetteville Sewage Treatment Plant.

Compliance History:

The following numbers of exceedences were noted in PCS:

- 6 TSS
- 2 Settleable Solids
- 2 E. coli
- 1 Fecal Coli
- 3 Suspended Solids % Removal
- 189 Overflows

Enforcement:
Agreed Order #05-0628
Database Notes: This permittee was originally on the Watch List for effluent violations. These Significant Non-Compliance (SNC) violation turned out to be data entry errors; however, the permittee has chronic collection system overflow problems. This Order includes CMOM requirements and a moratorium on connections to the collection system.
Submitted procedure to approve new sewer connections (item 9) on 11/7/05.
Submitted SEP for approval on 11/22/05. The SEP is for a greenway, but only has a very limited water quality component and does not include expenses. I will draft a letter for PED asking for the SEP to be revised to better address water quality concerns and requesting financial information on the proposal.
SEP proposal received 01/06/06, and approved 01/26/06. SEP valued at $25,000 (Required minimum is $10,000)
SORP received 03/14/06.
08/15/06 SSOER submitted as required by part XII, Item 3 of the order.
CMOM 2006 Self-assessment received 10/31/06.
Addendum to SEP received 11/17/06. SEP proposes to create greenway through town. Addendum changes specifications from crossing 2 city streets to only crossing 1. 11/27/06 SEP revision approved and approval letter issued on 11/30/06.
Sanitary Sewer Overflow Control Program submitted on 12/14/2006.

EFO Comments:
Recent unreported overflow.

TN0021857 Winchester Sewage Treatment Plant

Discharger rating: Major
City: Winchester
County: Franklin
EFO Name: Columbia
Issuance Date: 12/29/06
Expiration Date: 12/30/07
Receiving Stream(s): Elk River at mile 153.8
HUC-12: 060300030301
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: WAS to aerobic dig to drybds to land application

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
Ammonia as N (Total)	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
Ammonia as N (Total)	Summer	2	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	40	lb/day	DMax Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.5	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	27	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	10	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	200	lb/day	DMax Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	7.5	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	133	lb/day	MAvg Load	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	Summer	20	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	Summer	400	lb/day	DMax Load	3/Week	Composite	Effluent
CBOD5	Summer	15	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	Summer	10	mg/L	DMin Conc	3/Week	Composite	Effluent
CBOD5	Summer	267	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	Winter	30	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	Winter	667	lb/day	DMax Load	3/Week	Composite	Effluent
CBOD5	Winter	25	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	Winter	534	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	Winter	20	mg/L	DMin Conc	3/Week	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	25.6	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	25.6	Percent	DMin Conc	Quarterly	Composite	Effluent
Nitrogen Total (as N)	All Year		mg/L	MAvg Conc	2/Month	Composite	Effluent

Table 6-10a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Phosphorus, Total	All Year		mg/L	MAvg Conc	2/Month	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	0.09	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	1068	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	801	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-10b.

Tables 6-10a-b. Permit Limits for Winchester Sewage Treatment Plant.

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

- 3 Ammonia
- 32 Overflows
- 52 Bypasses

EFO Comments:
Need to confer with Nashville EFO.

TN0023469 Tullahoma Sewage Treatment Plant

Discharger rating: Major
City: Tullahoma
County: Coffee
EFO Name: Columbia
Issuance Date: 1/31/04
Expiration Date: 1/30/07
Receiving Stream(s): Rock Creek at mile 11.0
HUC-12: 060300030305
Effluent Summary: Treated municipal water from Outfall 001
Treatment system: WAS to thickner to aerobic dig to land application

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ag (T)	All Year	0.05	mg/L	MAvg Conc	Semi-annually	Composite	Effluent
Ammonia as N (Total)	Summer	3	mg/L	DMax Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	94	lb/day	DMax Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	2.25	mg/L	MAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	1.5	mg/L	WAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Summer	63	lb/day	MAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	6.5	mg/L	DMax Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	136	lb/day	MAvg Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	204	lb/day	DMax Load	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	3.25	mg/L	WAvg Conc	Weekdays	Composite	Effluent
Ammonia as N (Total)	Winter	4.9	mg/L	MAvg Conc	Weekdays	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	Weekdays	Calculated	% Removal
CBOD5	All Year	40	mg/L	DMax Conc	Weekdays	Composite	Effluent
CBOD5	All Year	1043	lb/day	MAvg Load	Weekdays	Composite	Effluent
CBOD5	All Year	35	mg/L	MAvg Conc	Weekdays	Composite	Effluent
CBOD5	All Year	25	mg/L	DMin Conc	Weekdays	Composite	Effluent
CBOD5	All Year	1460	lb/day	DMax Load	Weekdays	Composite	Effluent
Cu (T)	All Year	0.031	mg/L	MAvg Conc	Semi-annually	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Weekdays	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekdays	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekdays	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	95.6	Percent	DMin Conc	Monthly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	95.6	Percent	DMin Conc	Monthly	Composite	Effluent
NOEL 7day Ceriodaphnia Dubia	All Year	96	Percent	DMin Conc	Quarterly	Composite	Effluent
NOEL 7day Fathead Minnows	All Year	96	Percent	DMin Conc	Quarterly	Composite	Effluent

Table 6-11a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Composite	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekdays	Composite	Effluent
TSS	All Year	1668	lb/day	DMax Load	Weekdays	Composite	Effluent
TSS	All Year	30	mg/L	WAvg Conc	Weekdays	Composite	Effluent
TSS	All Year	1251	lb/day	MAvg Load	Weekdays	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	Weekdays	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	Weekdays	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-11b.

Tables 6-11a-b. Permit Limits for Tullahoma Sewage Treatment Plant.

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

- 3 Ammonia
- I Chlorine
- 1 Fecal coliform
- 20 Overflows
- 49 Bypasses

EFO Comments:
Need to confer with Nashville EFO.

TN0065498 Unity School

Discharger rating: Minor
City: Petersburg
County: Lincoln
EFO Name: Columbia
Issuance Date: 8/29/02
Expiration Date: 8/30/07
Receiving Stream(s): Morton Branch at mile 1.0
HUC-12: 060300030902
Effluent Summary: Treated domestic water from Outfall 001
Treatment system: Septic tank recirculating sand filter

Segment	TN06030003063_0300
Name	Morton Branch
Size	5.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-12. Stream Segment Information for Unity School.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	2.5	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Summer	1.25	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	Summer	25	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	Summer	15	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Monthly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.02	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
pH	All Year	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-13. Permit Limits for Unity School.

EFO Comments:
No issues.

TN0067202 University of Tennessee Space Institute

Discharger rating: Minor
City: Tullahoma
County: Coffee
EFO Name: Columbia
Issuance Date: 6/28/02
Expiration Date: 8/30/07
Receiving Stream(s): Rollins Creek Embayment (Woods Reservoir) at mile 0.7
HUC-12: 060300030201
Effluent Summary: Treated domestic water from Outfall 001
Treatment system: Extended aeration

Segment	TN06030003036_1000
Name	Woods Reservoir
Size	3908
Unit	Acres
First Year on 303(d) List	1990
Designated Uses	Irrigation (Supporting), Livestock Watering and Wildlife (Supporting), Recreation (Non-Supporting), Fish and Aquatic Life (Supporting), Industrial Water Supply (Supporting)
Causes	Polychlorinated biphenyls
Sources	Contaminated Sediments

Table 6-14. Stream Segment Information for University of Tennessee Space Institute.

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

Table 6-15. Permit Limits for University of Tennessee Space Institute.

EFO Comments:
No issues.

TN0076007 Elkton Sewage Treatment Plant

Discharger rating: Minor
City: Elkton
County: Giles
EFO Name: Columbia
Issuance Date: 8/30/02
Expiration Date: 8/30/07
Receiving Stream(s): Elk River at mile 49.2
HUC-12: 0603000301905
Effluent Summary: Treated municipal water from Outfall 001
Treatment system: Septic tank effluent pump (STEP) collection system, recirculating sand filter with UV disinfection

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	25	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	15	mg/L	MAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	3	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TSS	All Year	20	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent

Table 6-16. Permit Limits for Elkton Sewage Treatment Plant.

EFO Comments:
Need to confer with Nashville EFO.

6.4.B. Industrial Permits

TN0078697 Pelham Industrial Park RSF

Discharger rating: Minor
City: Pelham
County: Grundy
EFO Name: Chattanooga
Issuance Date: 7/29/05
Expiration Date: 7/29/07
Receiving Stream(s): Elk River at mile 195.2
HUC-12: 060300030103
Effluent Summary: Sanitary wastewater from Outfall 001
Treatment system: Recirculating sand filter

Segment	TN06030003044_1000
Name	Elk River
Size	17.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting), Domestic Water Supply (Supporting), Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting)
Causes	N/A
Sources	N/A

Table 6-17. Stream Segment Information for Pelham Industrial Park RSF.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	Summer	2	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	4	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	4	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	8	mg/L	DMax Conc	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	Summer	40	Percent	DMin % Removal	3/Week	Calculated	Percent Removal
CBOD % Removal	Winter	40	Percent	DMin % Removal	3/Week	Calculated	Percent Removal
CBOD5	All Year	15	mg/L	MAvg Conc	Semi-annually	Grab	Effluent
CBOD5	Summer	10	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	Summer	20	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	Summer		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Summer		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Winter	30	mg/L	DMax Conc	3/Week	Composite	Effluent

Table 6-18a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
CBOD5	Winter		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	Winter		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
D.O.	All Year	3	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Settleable Solids	All Year	1	mg/L	DMax Conc	Weekdays	Grab	Effluent
TRC	All Year	0.63	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	10	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	20	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	Percent Removal
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent

Table 6-18b.

Tables 6-18a-b. Permit Limits for Pelham Industrial Park RSF.

EFO Comments:
No issues.

TN0003751 Arnold Engineering Development Center

Discharger rating: Minor
City: Arnold Air Force Base
County: Franklin
EFO Name: Columbia
Issuance Date: 4/8/05
Expiration Date: 5/31/07
Receiving Stream(s): **U**nnamed tributary to Rowland Creek (001); unnamed tributary to Bradley Creek (002, SW2 & 007); unnamed tributary to Brumalow Creek (003, SW3 & 005); unnamed tributary to Spring Creek (006); and Woods Reservoir (004 & 008)
HUC-12: 060300030205
Effluent Summary: Treated process wastewater, non-process wastewater, sanitary wastewater, remediated groundwater and storm water runoff from Outfall 001; process wastewater, non-process wastewater, remediated groundwater, and storm water runoff from Outfall SW2; process wastewater, non-process wastewater and storm water runoff from SW3 (incl. Outfall 005); non-process wastewater during scheduled maintenance activities that require shutdown of the pumping station and system malfunctions from Outfalls 002 and 003; treated sanitary wastewater from Outfall 004; steam plant condensate and reverse osmosis wastewater, process wastewater, noncontact cooling water and storm water runoff from Outfall 005; treated groundwater from Outfall 006; nonprocess wastewater, building groundwater drainage, and non-industrial
Treatment system: WAS to anaerobic digester to dry bed to land application

Segment	TN06030003435_1000
Name	Rollins Creek
Size	11.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Irrigation (Supporting), Livestock Watering and Wildlife (Supporting), Fish and Aquatic Life (Non-Supporting), Industrial Water Supply (Supporting), Recreation (Not Assessed)
Causes	Low flow alterations, Temperature, water
Sources	Industrial Point Source Discharge

Table 6-19. Stream Segment Information for Arnold Engineering Development Center.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ag (T)	All Year	0.003	mg/L	DMax Conc	Monthly	Composite	Effluent
Ammonia as N (Total)	All Year	2.2	mg/L	DMax Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	All Year	1.1	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD5	All Year	25	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	All Year	15	mg/L	MAvg Conc	Weekly	Composite	Effluent
Cd (T)	All Year	0.005	mg/L	DMax Conc	Weekly	Composite	Effluent
Cd (T)	All Year	0.003	mg/L	MAvg Conc	Weekly	Composite	Effluent
Cr (T)	All Year	0.2	mg/L	DMax Conc	Monthly	Composite	Effluent
Cr (T)	All Year	0.1	mg/L	MAvg Conc	Monthly	Composite	Effluent
Cu (T)	All Year	0.04	mg/L	DMax Conc	Monthly	Composite	Effluent
Cu (T)	All Year	0.03	mg/L	MAvg Conc	Monthly	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekly	Grab	Effluent
Dissolved Solids, Total (TDS)	All Year		mg/L	DMax Conc	Monthly	Composite	Effluent
Dissolved Solids, Total (TDS)	All Year		mg/L	DMax Conc	Monthly	Composite	Influent (Raw Sewage)
Dissolved Solids, Total (TDS)	All Year		mg/L	MAvg Conc	Monthly	Composite	Effluent
Dissolved Solids, Total (TDS)	All Year		mg/L	MAvg Conc	Monthly	Composite	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Continuous	Recorder	Effluent
Flow	All Year		MGD	MAvg Load	Continuous	Recorder	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	100	Percent	DMin Conc	Semi-annually	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Semi-annually	Composite	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	Monthly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	MAvg Conc	Monthly	Grab	Effluent
Pb (T)	All Year	0.1	mg/L	DMax Conc	Weekly	Composite	Effluent
Pb (T)	All Year	0.01	mg/L	MAvg Conc	Weekly	Composite	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Weekly	Grab	Effluent
TRC	All Year	0.011	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS	All Year		mg/L	DMax Conc	Monthly	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	Monthly	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	Monthly	Composite	Influent (Raw Sewage)
TSS	All Year		mg/L	MAvg Conc	Monthly	Composite	Influent (Raw Sewage)
Temperature (°C)	All Year		°C	DMax Conc	Continuous	Recorder	Effluent
pH	All Year	9	SU	DMax Conc	Continuous	Recorder	Effluent
pH	All Year	6.5	SU	DMin Conc	Continuous	Recorder	Effluent

Table 6-20. Permit Limits for Outfall 001 at Arnold Engineering Development Center.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
COD	All Year		mg/L	DMax Conc	1/Discharge	Grab	Effluent
Flow	All Year		MGD	DMax Load	1/Discharge	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	1/Discharge	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	1/Discharge	Grab	Effluent
Temperature (°C)	All Year		°C	DMax Conc	1/Discharge	Grab	Effluent
pH	All Year	9	SU	DMax Conc	1/Discharge	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	1/Discharge	Grab	Effluent

Table 6-21. Permit Limits for Outfall 002 and 003 at Arnold Engineering Development Center.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	8	mg/L	DMax Conc	2/Month	Composite	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	2/Month	Composite	Effluent
BOD5	All Year	45	mg/L	DMax Conc	2/Month	Composite	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	2/Month	Composite	Effluent
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	400	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Continuous	Recorder	Effluent
Flow	All Year		MGD	MAvg Load	Continuous	Recorder	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	2/Week	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Composite	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-22. Permit Limits for Outfall 004 at Arnold Engineering Development Center.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Load	Monthly	Estimate	Effluent
Oil and Grease (Freon EM)	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
Temperature (°C)	All Year		°C	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-23. Permit Limits for Outfall 005 at Arnold Engineering Development Center.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
1,1-Dichloroethylene	All Year	0.005	mg/L	DMax Conc	Quarterly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Quarterly	Estimate	Effluent
Flow	All Year		MGD	MAvg Load	Quarterly	Estimate	Effluent
Methylene Chloride	All Year	0.025	mg/L	DMax Conc	Quarterly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-24. Permit Limits for Outfall 006 at Arnold Engineering Development Center.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Load	Monthly	Estimate	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-25. Permit Limits for Outfall 007 and 008 at Arnold Engineering Development Center.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Load	Quarterly	Estimate	Effluent
Trichloroethylene	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
pH	All Year		SU	DMax Conc	Quarterly	Grab	Effluent
pH	All Year		SU	DMin Conc	Quarterly	Grab	Effluent

Table 6-26. Permit Limits for Outfall 01b at Arnold Engineering Development Center.

EFO Comments:

Developing and testing of aerospace systems and components in aerodynamic, propulsion, and space environmental ground test facilities that simulate flight conditions. No issues.

TN0027537 TVA Tims Ford Hydro Plant

Discharger rating: Major
City: Winchester
County: Franklin
EFO Name: Columbia
Issuance Date: 4/30/02
Expiration Date: 4/30/07
Receiving Stream(s): Elk River at mile 133.3
HUC-12: 060300030501
Effluent Summary: cooling water from Outfall 001
Treatment system:

No Limits.

Comments:
Hydroelectric services

TN0001953 Jack Daniel Distillery, Lem Motlow Prop, Inc.

Discharger rating: Major
City: Lynchburg
County: Moore
EFO Name: Columbia
Issuance Date: 12/16/02
Expiration Date: 12/31/07
Receiving Stream(s): East Fork Mulberry Creek at mile 12.9 (Outfalls 001 and SW1) and mile 13.3 (Outfalls 002, SW2 and SW3)
HUC-12: 060300030701
Effluent Summary: Cooling water, boiler blowdown, spring water, effluent from sequencing batch reactor (SBR), outside washwater and storm water runoff from Outfall 001, effluent from SBR from Outfall 002, and storm water runoff from Outfalls SW1, SW2 and SW3
Treatment system: Aeration, Mixing, Evaporation, Settling, Chemical Oxidation, Neutralization, Filtration, Ion Exchange, and Disinfection.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	3	mg/L	DMax Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	2	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	15	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	Weekly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekly	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	51	Percent	DMin Conc	Annually	Composite	Effluent
IC25 7day Fathead Minnows	All Year	51	Percent	DMin Conc	Annually	Composite	Effluent
Nitrogen Total (as N)	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
Phosphorus, Total	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.03	mg/L	DMax Conc	Weekly	Grab	Effluent
Temperature (°C)	All Year		Deg. C	DMax Conc	Weekly	Grab	Effluent
Temperature (°C)	All Year		Deg. C	MAvg Conc	Weekly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-27. Permit Limits for Outfall 001 at Jack Daniel Distillery, Lem Motlow Prop, Inc.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Ammonia as N (Total)	All Year	4.5	mg/L	DMax Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	7.5	mg/L	DMax Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	3	mg/L	MAvg Conc	Weekly	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	30	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	45	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	20	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	30	mg/L	MAvg Conc	Weekly	Grab	Effluent

Table 6-28a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
D.O.	All Year	6	mg/L	DMin Conc	Weekly	Grab	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	60	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	25	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	60	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	25	Percent	DMin Conc	Quarterly	Composite	Effluent
Nitrogen Total (as N)	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
Phosphorus, Total	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Weekly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-28b.

Table 6-28 a-b. Permit Limits for Outfall 002 at Jack Daniel Distillery, Lem Motlow Prop, Inc.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
CBOD5	All Year	30	mg/L	DMax Conc	Weekly	Grab	Effluent
CBOD5	All Year	90	lb/day	DMax Load	Weekly	Grab	Effluent
CBOD5	All Year	20	mg/L	MAvg Conc	Weekly	Grab	Effluent
CBOD5	All Year	60	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	50	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year	150	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS	All Year	90	lb/day	MAvg Load	Weekly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-29. Permit Limits for Outfall 01B at Jack Daniel Distillery, Lem Motlow Prop, Inc.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Floating Solids Or Visible Foam-Visual	All Year		Visual	DMax Load	Semi-annually	Visual	Effluent
Floating Solids Or Visible Foam-Visual	All Year		YES=1 NO=0	DMax Load	Semi-annually	Visual	Effluent
Floating Solids Or Visible Foam-Visual	All Year		Visual	MAvg Load	Semi-annually	Visual	Effluent
pH	All Year		SU	DMax Conc	Semi-annually	Grab	Effluent
pH	All Year		SU	DMin Conc	Semi-annually	Grab	Effluent

Table 6-30. Permit Limits for Outfall 003 at Jack Daniel Distillery, Lem Motlow Prop, Inc.

Compliance History:

The following numbers of exceedences were noted in PCS:

- 4 Dissolved Oxygen
- 1 pH.

EFO Comments:

No issues.

6.4.B. Water Treatment Plant Permits

TN0060372 Monteagle Water Treatment Plant

Discharger rating: Minor
City: Monteagle
County: Marion
EFO Name: Chattanooga
Issuance Date: 9/29/04
Expiration Date: 9/29/09
Receiving Stream(s): Laurel Branch at mile 0.3 to Trussell Creek
HUC-12: 060300030103
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Ferric chloride, chlorine, caustic soda, fluoride, potassium permanganate, Aquodine

Segment	TN06030003044_0730
Name	Trussel Creek
Size	4.3
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Livestock Watering and Wildlife (Supporting), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Recreation (Not Assessed)
Causes	Solids (Suspended/Bedload), Nutrient/Eutrophication Biological Indicators, 461, Oxygen, Dissolved
Sources	Municipal Point Source Discharges

Table 6-31. Stream Segment Information for Monteagle Water Treatment Plant.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	0.75	mg/L	DMax Conc	Monthly	Grab	Effluent
Fe (T)	All Year	2	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-32. Permit Limits for Monteagle Water Treatment Plant.

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

- 1 Aluminum exceedence.

Comments:
Iron and turbidity removal Water Treatment Plant

TN0004979 Fayetteville Water Treatment Plant

Discharger rating: Minor
City: Fayetteville
County: Lincoln
EFO Name: Columbia
Issuance Date: 9/29/04
Expiration Date: 9/29/09
Receiving Stream(s): Elk River at miles 93.8
HUC-12: 060300030505
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Ferric chloride, chlorine, caustic soda, fluoride, potassium permanganate, Aquodine

Segment	TN06030003010_1000
Name	Elk River
Size	13.91
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Domestic Water Supply (Supporting), Livestock Watering and Wildlife (Supporting), Irrigation (Supporting), Recreation (Non-Supporting), Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting)
Causes	Escherichia coli
Sources	Grazing in Riparian or Shoreline Zones

Table 6-33. Stream Segment Information for Fayetteville Water Treatment Plant.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	10	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	1	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-34. Permit Limits for Fayetteville Water Treatment Plant.

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

- 5 Settleable Solids

Comments:
Iron, manganese and turbidity removal Water Treatment Plant

TN0074853 Huntland Water Treatment Plant

Discharger rating: Minor
City: Huntland
County: Franklin
EFO Name: Columbia
Issuance Date: 9/29/04
Expiration Date: 9/29/09
Receiving Stream(s): Mathias Branch into Beans Creek at approximate mile 2.0
HUC-12: 060300030601
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: -

Segment	TN06030003012_0999
Name	Misc Tribs to Beans Creek
Size	26.3
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Livestock Watering and Wildlife (Not Assessed), Fish and Aquatic Life (Not Assessed), Recreation (Not Assessed), Irrigation (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-35. Stream Segment Information for Huntland Water Treatment Plant.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	0.75	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-36. Permit Limits for Huntland Water Treatment Plant

Compliance History:
None noted.

Comments:
Turbidity removal Water Treatment Plant

TN0073687 Center Grove Winchester Springs Utility Department

Discharger rating: Minor
City: Estill Springs
County: Franklin
EFO Name: Columbia
Issuance Date: 9/29/04
Expiration Date: 9/29/09
Receiving Stream(s): Little Hurricane Creek at mile 4.2
HUC-12: 060300030306
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Magnesium and turbidity removal with aluminum sulfate, polymer, sodium hydroxide

Segment	TN06030003406_1000
Name	Little Hurricane Creek
Size	5.02
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-37. Stream Segment Information for Center Grove Winchester Springs Utility Department.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	0.75	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-38. Permit Limits for Center Grove Winchester Springs Utility Department.

Comments:
Turbidity removal Water Treatment Plant

TN0074837 Estill Springs Water Treatment Plant

Discharger rating: Minor
City: Estill Springs
County: Franklin
EFO Name: Columbia
Issuance Date: 9/29/04
Expiration Date: 9/29/09
Receiving Stream(s): Taylor Creek at mile 1.5 of the Elk River
HUC-12: 060300030304
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Chlorine, alum, caustic soda, phosphate and fluoride

Segment	TN06030003432_1000
Name	Taylor Creek
Size	9.1
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-39. Stream Segment Information for Estill Springs Water Treatment Plant.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	0.75	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-40. Permit Limits for Estill Springs Water Treatment Plant.

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

- 1 pH
- 1 Aluminum
- 7 Chlorine.

Comments:
Iron, manganese and turbidity removal Water Treatment Plant

TN0061191 Metro Moore County Utility Department

Discharger rating: Minor
City: Lynchburg
County: Moore
EFO Name: Columbia
Issuance Date: 9/29/04
Expiration Date: 9/29/09
Receiving Stream(s): Mulberry Creek
HUC-12: 060300030701
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Chlorine, potassium permanganate, aluminum sulfate added at flash mix for coagulation, oxidation and manganese reduction; fluoride, sodium phosphate added at clear well

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	0.75	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-41. Permit Limits for Metro Moore County Utility Department.

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

- 23 Chlorine

Comments:
Manganese and turbidity removal Water Treatment Plant

TN0068462 Teal Hollow Springs Water Treatment Plant

Discharger rating: Minor
City: Kelso
County: Lincoln
EFO Name: Columbia
Issuance Date: 10/07/04
Expiration Date: 9/29/09
Receiving Stream(s): Unnamed tributary to Dukes Creek
HUC-12: 060300030504
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Aluminum chlorhydrate (ACS) as coagulant and disinfection with chlorine

Segment	TN06030003010_0500
Name	Dukes Creek
Size	14.4
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-42. Stream Segment Information for Teal Hollow Springs Water Treatment Plant.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	0.75	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-43. Permit Limits for Teal Hollow Springs Water Treatment Plant.

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

- 2 Chlorine.

Comments:
Turbidity removal Water Treatment Plant

TN0005665 Winchester Water System WTP

Discharger rating: Minor
City: Winchester
County: Franklin
EFO Name: Columbia
Issuance Date: 2/15/06
Expiration Date: 9/27/09
Receiving Stream(s): Elk River at mile 154.7 to Tims Ford Reservoir
HUC-12: 060300030301
Effluent Summary: Filter backwash and/or sedimentation basin washdown from Outfall 001
Treatment system: Chlorine, fluoride, NaMnO4, PAC, aquadine, caustic soda

Segment	TN06030003015_1000
Name	Elk River
Size	15.4
Unit	Miles
First Year on 303(d) List	1990
Designated Uses	Livestock Watering and Wildlife (Supporting), Domestic Water Supply (Supporting), Industrial Water Supply (Supporting), Fish and Aquatic Life (Non-Supporting), Recreation (Supporting), Irrigation (Supporting)
Causes	Low flow alterations, Temperature, water
Sources	Upstream Impoundments (e.g., PI-566 NRCS Structures)

Table 6-44. Stream Segment Information for Winchester Water System WTP.

PARAMETER	*SEASON*	*LIMIT*	*UNITS*	*SAMPLE DESIGNATOR*	*MONITORING FREQUENCY*	*SAMPLE TYPE*	*MONITORING LOCATION*
Al (T)	All Year	10	mg/L	DMax Conc	Monthly	Grab	Effluent
Fe (T)	All Year	10	mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	1	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-45. Permit Limits for Winchester Water System WTP.

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

Enforcement:

EFO Comments: None

APPENDIX II

ID	NAME	HAZARD
267003	Cheston Lake	3
267005	Lake Finney	3
267006	Athletic Field	O
267010	Saint Andrews	3
287004	Logan	2
317005	Cumberland Mountain Lake	3
317011	Skymount #1	3
317012	Skymount #2	3
317013	Ramsey	1
317015	Cumberland Mountain Lake #3	3
527001	Timber Lake	3
527002	Lou's Lake	3
527003	Lincoln Lake	3
527005	Rambo (Oakwood Acres)	3
527007	Carter Lake	S
527009	Whitaker Lake	3
527010	Lake Fontaine	S
527011	Carter #2	L
597001	Allison Lake	2
597002	Mckinnon	S
647001	Cumberland Springs	B
957002	Ramsgate Development	N

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

LAND COVER/LAND USE	ACRES	% OF WATERSHED
Open Water	17,318	2.1
Other Grasses	4,088	0.5
Pasture/Hay	219,649	26.8
Row Crops	109,141	13.3
Woody Wetlands	10,788	1.3
Emergent Herbaceous Wetlands	861	0.1
Deciduous Forest	300,081	36.6
Mixed Forest	104,756	12.8
Evergreen Forest	39,422	4.8
High Intensity: Commercial/Industrial	4,608	0.6
High Intensity: Residential	914	0.1
Low Intensity: Residential	5,817	0.7
Quarries/Strip Mines/Gravel Pits	453	0.1
Transitional	1,531	0.2
Total	**819,427**	**100.0**

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

ECOREGION	REFERENCE STREAM	WATERSHED	HUC
Cumberland Plateau (68a)	Rock Creek	South Fork Cumberland	05130104
	Laurel Fork	South Fork Cumberland	05130104
	Clear Creek	Emory River	06010208
	Piney Creek	Watts Bar/Fort Loudoun Lake	06010201
	Mullens Creek	Tennessee River	06020001
	Daddy's Creek	Emory River	06010208
	Island Creek	Emory River	06010208
	Rock Creek	Emory River	06010208
Plateau Escarpment (68c)	Ellis Gap Branch	Tennessee River	06020001
	Mud Creek	Upper Elk River	06030003
	Crow Creek	Guntersville Lake	06030001
	Crow Creek	Guntersville Lake	06030001
Eastern Highland Rim (71g)	Flat Fork	Cordell Hull lake	05130106
	Hurricane Creek	Upper Elk River	06030003
	Spring Creek	Cordell Hull Lake	05130106
Outer Nashville Basin (71h)	Carson Fork	Stones River	05130203
	Clear Fork	Caney Fork River	05130108
	Flynn Creek	Cordell Hull Lake	05130106

Table A2-3. Ecoregion Monitoring Sites in Ecoregions 68a, 68c, 71g, and 71h.

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CODE	NAME	AGENCY	AGENCY ID
5	TDEC/DNH STEWARTS SWAMP SITE	TDEC/DNH	S.USTNHP 334
27	TDEC/DNH GOOSE POND REGISTERED STATE NATURAL AREA	TDEC/DNH	S.USTNHP 243
37	TDEC/DNH AEDC POWERLINE BARRENS STATE NATURAL AREA	TDEC/DNH	M.USTNHP 86
93	TDEC/DNH AEDC COW POND AND FOREST SITE	TDEC/DNH	S.USTNHP 315
95	TDEC/DNH AEDC UPPER HICKERSON CREEK SITE	TDEC/DNH	S.USTNHP 774
104	TDEC/DNH DICKEL BARRENS SITE	TDEC/DNH	S.USTNHP 97
149	TDEC/DNH MINGO SWAMP WILDLIFE MANAGEMENT AREA SITE	TDEC/DNH	M.USTNHP 2494
191	TDEC/DNH BLUEBELL ISLAND SITE	TDEC/DNH	
203	USACOE-NASHVILLE CLIENT SITE	USACOE-N	
252	USACOE-NASHVILLE CLIENT SITE	USACOE-N	
260	USACOE-NASHVILLE CLIENT SITE	USACOE-N	
293	TDOT SR 50 MITIGATION/PERMIT SITE	TDOT	
294	TDOT SR 50 MITIGATION/PERMIT SITE	TDOT	
428	TDEC/WPC NORTH FORK ROCK CREEK WPC PERMIT SITE	TDEC/WPC	
579	USFWS AEDC #47	USFWS	AEDC.47
580	USFWS AEDC #48	USFWS	AEDC.48
581	USFWS AEDC #49	USFWS	AEDC.49
582	USFWS AEDC #50	USFWS	AEDC.50
583	USFWS AEDC #51	USFWS	AEDC.51
584	USFWS AEDC #52	USFWS	AEDC.52
586	USFWS AEDC #54	USFWS	AEDC.54
587	USFWS AEDC #55	USFWS	AEDC.55
588	USFWS AEDC #56	USFWS	AEDC.56
589	USFWS AEDC #57	USFWS	AEDC.57
591	USFWS AEDC #59	USFWS	AEDC.59
592	USFWS AEDC #60	USFWS	AEDC.60
593	USFWS AEDC #61	USFWS	AEDC.61
594	USFWS AEDC #62	USFWS	AEDC.62
595	USFWS AEDC #63	USFWS	AEDC.63
596	USFWS AEDC #64	USFWS	AEDC.64
597	USFWS AEDC #65	USFWS	AEDC.65
598	USFWS AEDC #66	USFWS	AEDC.66
600	USFWS AEDC #68	USFWS	AEDC.68
601	USFWS AEDC #69	USFWS	AEDC.69
602	USFWS AEDC #70	USFWS	AEDC.70
603	USFWS AEDC #71	USFWS	AEDC.71
604	USFWS AEDC #72	USFWS	AEDC.72
605	USFWS AEDC #73	USFWS	AEDC.73
606	USFWS AEDC #74	USFWS	AEDC.74
607	USFWS AEDC #75	USFWS	AEDC.75
608	USFWS AEDC #76	USFWS	AEDC.76
609	USFWS AEDC #77	USFWS	AEDC.77
610	USFWS AEDC #78	USFWS	AEDC.78
611	USFWS AEDC #79	USFWS	AEDC.79
612	USFWS AEDC #80	USFWS	AEDC.80
613	USFWS AEDC #81	USFWS	AEDC.81
614	USFWS AEDC #82	USFWS	AEDC.82
615	USFWS AEDC #83	USFWS	AEDC.83
616	USFWS AEDC #84	USFWS	AEDC.84
617	USFWS AEDC #85	USFWS	AEDC.85

618	USFWS AEDC #86	USFWS	AEDC.86
619	USFWS AEDC #87	USFWS	AEDC.87
620	USFWS AEDC #88	USFWS	AEDC.88
670	USFWS AEDC #137	USFWS	AEDC.137
671	USFWS AEDC #138	USFWS	AEDC.138
683	USFWS AEDC #150	USFWS	AEDC.150
684	USFWS AEDC #151	USFWS	AEDC.151
687	USFWS AEDC #154	USFWS	AEDC.154
688	USFWS AEDC #155	USFWS	AEDC.155
689	USFWS AEDC #156	USFWS	AEDC.156
692	USFWS AEDC #159	USFWS	AEDC.159
693	USFWS AEDC #160	USFWS	AEDC.160
694	USFWS AEDC #161	USFWS	AEDC.161
695	USFWS AEDC #162	USFWS	AEDC.162
696	USFWS AEDC #163	USFWS	AEDC.163
697	USFWS AEDC #164	USFWS	AEDC.164
698	USFWS AEDC #165	USFWS	AEDC.165
699	USFWS AEDC #166	USFWS	AEDC.166
700	USFWS AEDC #167	USFWS	AEDC.167
701	USFWS AEDC #168	USFWS	AEDC.168
702	USFWS AEDC #169	USFWS	AEDC.169
703	USFWS AEDC #170	USFWS	AEDC.170
704	USFWS AEDC #171	USFWS	AEDC.171
705	USFWS AEDC #172	USFWS	AEDC.172
706	USFWS AEDC #173	USFWS	AEDC.173
707	USFWS AEDC #174	USFWS	AEDC.174
708	USFWS AEDC #175	USFWS	AEDC.175
709	USFWS AEDC #176	USFWS	AEDC.176
710	USFWS AEDC #177	USFWS	AEDC.177
711	USFWS AEDC #178	USFWS	AEDC.178
712	USFWS AEDC #179	USFWS	AEDC.179
713	USFWS AEDC #180	USFWS	AEDC.180
714	USFWS AEDC #181	USFWS	AEDC.181
715	USFWS AEDC #182	USFWS	AEDC.182
716	USFWS AEDC #183	USFWS	AEDC.183
717	USFWS AEDC #184	USFWS	AEDC.184
718	USFWS AEDC #185	USFWS	AEDC.185
719	USFWS AEDC #186	USFWS	AEDC.186
720	USFWS AEDC #187	USFWS	AEDC.187
721	USFWS AEDC #188	USFWS	AEDC.188
722	USFWS AEDC #189	USFWS	AEDC.189
723	USFWS AEDC #190	USFWS	AEDC.190
724	USFWS AEDC #191	USFWS	AEDC.191
725	USFWS AEDC #192	USFWS	AEDC.192
726	USFWS AEDC #193	USFWS	AEDC.193
727	USFWS AEDC #194	USFWS	AEDC.194
728	USFWS AEDC #195	USFWS	AEDC.195
729	USFWS AEDC #196	USFWS	AEDC.196
730	USFWS AEDC #197	USFWS	AEDC.197
731	USFWS AEDC #198	USFWS	AEDC.198
732	USFWS AEDC #199	USFWS	AEDC.199
733	USFWS AEDC #200	USFWS	AEDC.200

734	USFWS AEDC #201	USFWS	AEDC.201
735	USFWS AEDC #202	USFWS	AEDC.202
736	USFWS AEDC #203	USFWS	AEDC.203
737	USFWS AEDC #204	USFWS	AEDC.204
738	USFWS AEDC #205	USFWS	AEDC.205
739	USFWS AEDC #206	USFWS	AEDC.206
741	USFWS AEDC #208	USFWS	AEDC.208
742	USFWS AEDC #209	USFWS	AEDC.209
745	USFWS AEDC #212	USFWS	AEDC.212
746	USFWS AEDC #213	USFWS	AEDC.213
747	USFWS AEDC #214	USFWS	AEDC.214
748	USFWS AEDC #215	USFWS	AEDC.215
749	USFWS AEDC #216	USFWS	AEDC.216
750	USFWS AEDC #217	USFWS	AEDC.217
751	USFWS AEDC #218	USFWS	AEDC.218
753	USFWS AEDC #220	USFWS	AEDC.220
754	USFWS AEDC #221	USFWS	AEDC.221
755	USFWS AEDC #222	USFWS	AEDC.222
756	USFWS AEDC #223	USFWS	AEDC.223
757	USFWS AEDC #224	USFWS	AEDC.224
758	USFWS AEDC #225	USFWS	AEDC.225
759	USFWS AEDC #226	USFWS	AEDC.226
760	USFWS AEDC #227	USFWS	AEDC.227
761	USFWS AEDC #228	USFWS	AEDC.228
762	USFWS AEDC #229	USFWS	AEDC.229
763	USFWS AEDC #230	USFWS	AEDC.230
764	USFWS AEDC #231	USFWS	AEDC.231
765	USFWS AEDC #232	USFWS	AEDC.232
786	USFWS AEDC #253	USFWS	AEDC.253
787	USFWS AEDC #254	USFWS	AEDC.254
788	USFWS AEDC #255	USFWS	AEDC.255
789	USFWS AEDC #256	USFWS	AEDC.256
790	USFWS AEDC #257	USFWS	AEDC.257
791	USFWS AEDC #258	USFWS	AEDC.258
792	USFWS AEDC #259	USFWS	AEDC.259
793	USFWS AEDC #260	USFWS	AEDC.260
795	USFWS AEDC #262	USFWS	AEDC.262
796	USFWS AEDC #263	USFWS	AEDC.263
797	USFWS AEDC #264	USFWS	AEDC.264
798	USFWS AEDC #265	USFWS	AEDC.265
799	USFWS AEDC #266	USFWS	AEDC.266
800	USFWS AEDC #267	USFWS	AEDC.267
801	USFWS AEDC #268	USFWS	AEDC.268
802	USFWS AEDC #269	USFWS	AEDC.269
803	USFWS AEDC #270	USFWS	AEDC.270
804	USFWS AEDC #271	USFWS	AEDC.271
805	USFWS AEDC #272	USFWS	AEDC.272
806	USFWS AEDC #273	USFWS	AEDC.273
807	USFWS AEDC #274	USFWS	AEDC.274
808	USFWS AEDC #275	USFWS	AEDC.275
809	USFWS AEDC #276	USFWS	AEDC.276
810	USFWS AEDC #277	USFWS	AEDC.277

811	USFWS AEDC #278	USFWS	AEDC.278
812	USFWS AEDC #279	USFWS	AEDC.279
813	USFWS AEDC #280	USFWS	AEDC.280
814	USFWS AEDC #281	USFWS	AEDC.281
815	USFWS AEDC #282	USFWS	AEDC.282
816	USFWS AEDC #283	USFWS	AEDC.283
817	USFWS AEDC #284	USFWS	AEDC.284
818	USFWS AEDC #285	USFWS	AEDC.285
819	USFWS AEDC #286	USFWS	AEDC.286
820	USFWS AEDC #287	USFWS	AEDC.287
821	USFWS AEDC #288	USFWS	AEDC.288
822	USFWS AEDC #289	USFWS	AEDC.289
823	USFWS AEDC #290	USFWS	AEDC.290
824	USFWS AEDC #291	USFWS	AEDC.291
825	USFWS AEDC #292	USFWS	AEDC.292
826	USFWS AEDC #293	USFWS	AEDC.293
931	TDEC/DNH RON JONES: GRUNDY COUNTY SITE 11	TDEC/DNH	F88JON01TNUS
964	TDEC/DNH RON JONES: FRANKLIN CO SITE 57	TDEC/DNH	F88JON01TNUS
1258	TWRA SITE	TWRA	
1513	USACOE TDOT (UTILIZE COFFEE COUNTY WETLAND BANK)	USFWS	
1908	TWRA MINGO SWAMP SITE	TWRA	
1909	TWRA MINGO SWAMP SITE	TWRA	
1910	TWRA MINGO SWAMP SITE	TWRA	
2072	TWRA MINGO SWAMP SITE	TWRA	
2073	TWRA MINGO SWAMP SITE	TWRA	
2074	TWRA MINGO SWAMP SITE	TWRA	
2075	TWRA MINGO SWAMP SITE	TWRA	
2076	TWRA MINGO SWAMP SITE	TWRA	
2077	TWRA MINGO SWAMP SITE	TWRA	
2078	TWRA MINGO SWAMP SITE	TWRA	
2377	TWRA MINGO SWAMP SITE	TWRA	
2378	TWRA MINGO SWAMP SITE	TWRA	
2379	TWRA MINGO SWAMP SITE	TWRA	
2380	TWRA MINGO SWAMP SITE	TWRA	
2381	TWRA MINGO SWAMP SITE	TWRA	
2382	TWRA MINGO SWAMP SITE	TWRA	
2383	TWRA MINGO SWAMP SITE	TWRA	
2384	TWRA MINGO SWAMP SITE	TWRA	
2385	TWRA MINGO SWAMP SITE	TWRA	
2386	TWRA MINGO SWAMP SITE	TWRA	
2387	TWRA MINGO SWAMP SITE	TWRA	
2388	TWRA MINGO SWAMP SITE	TWRA	
2389	TWRA MINGO SWAMP SITE	TWRA	
2390	TWRA MINGO SWAMP SITE	TWRA	
2391	TWRA MINGO SWAMP SITE	TWRA	
2392	TWRA MINGO SWAMP SITE	TWRA	
2393	TWRA MINGO SWAMP SITE	TWRA	
2394	TWRA MINGO SWAMP SITE	TWRA	
2395	TWRA MINGO SWAMP SITE	TWRA	
2396	TWRA MINGO SWAMP SITE	TWRA	
2397	TWRA MINGO SWAMP SITE	TWRA	
2398	TWRA MINGO SWAMP SITE	TWRA	

2399	TWRA MINGO SWAMP SITE	TWRA	
2400	TWRA MINGO SWAMP SITE	TWRA	
2606	TDOT UNNAMED TRIBUTARIES TO SWAN CREEK SITE	TDOT	93.654
2695	NRCS SITE	NRCS	
2724	USACOE NASHVILLE SITE	USACOE-N	960048390
2729	USACOE LAWRENCE KENNERLY FARM (FRANKLIN) SITE	USACOE-N	960047999
2779	TDEC/DNH POND SPRING SITE	TDEC/DNH	

Table A2-4. Wetland Sites in Upper Elk River Watershed in TDEC Database. *TDEC, Tennessee Department of Environment and Conservation; USACOE-N, United States Army Corps of Engineers-Nashville District; WPC, Water Pollution Control; TDOT, Tennessee Department of Transportation' USFWS, United States Fish and Wildlife Service; TWRA, Tennessee Wildlife Resources Agency; DNH, Division of Natural Heritage.* ***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)
Beans Creek	TN06030003012_2000	10.6
Beans Creek	TN06030003012_1000	10.7
Beans Creek	TN06030003049_1000	26.6
Boiling Fork Creek	TN06030003030_1000	32.4
Bostick Creek	TN06030003044_0300	4.9
Bradley Creek	TN06030003051_1000	40.6
Bradshaw Creek	TN06030003064_1000	27.0
Brumalow Creek	TN06030003441_1000	6.9
Buckeye Creek	TN06030003056_0120	8.6
Caldwell Creek	TN06030003044_0700	14.1
Caney Hollow Creek	TN06030003012_0100	13.4
Carr Creek	TN06030003001_0300	10.7
Coffee Creek	TN06030003015_0300	12.4
Coldwater Creek	TN06030003006_1000	37.3
Dick Creek	TN06030003043_0100	5.2
Dry Creek	TN06030003044_0600	13.8
Dry Creek	TN06030003051_0100	9.7
Dry Creek	TN06030003053_0200	10.4
Dukes Creek	TN06030003010_0500	14.4
East Fork Mulberry Creek	TN06030003056_0400	19.0
East Fork Mulberry Creek	TN06030003056_0200	14.0
Elk River	TN06030003001_1000	50.1
Elk River	TN06030003010_1000	35.3
Elk River	TN06030003041_1000	7.7
Elk River	TN06030003044_2000	3.4
Elk River	TN06030003044_1000	17.9
Factory Branch	TN06030003012_0200	20.5
Fall Lick Creek	TN06030003091_1000	2.2
Farris Creek	TN06030003015_0100	17.2
Gilliam Creek	TN06030003044_0720	4.3
Hurricane Creek	TN06030003055_1000	7.7
Indian Creek	TN06030003012_0500	9.0
Indian Creek	TN06030003065_1000	20.5
Kelly Creek	TN06030003003_1000	26.1
Lees Creek	TN06030003010_0600	9.1
Little Hurricane Creek	TN06030003406_1000	5.0
Little Norris Creek	TN06030003059_0100	26
Molino Creek	TN06030003001_0400	9.3
Mud Creek	TN06030003043_1000	17.2
Mulberry Creek	TN06030003056_1000	2.0
Murrel Creek	TN06030003015_0400	7.2
Norris Creek	TN06030003059_1000	49.6
Norwood Creek	TN06030003030_0200	20.4
Poorhouse Creek	TN06030003053_0300	5.8
Robinson Creek	TN06030003010_0300	5.2
Rock Creek	TN06030003053_1000	7.0
Rose Creek	TN06030003043_0200	4.1
Shelton Creek	TN06030003010_0400	11.6

Short Creek	TN06030003001_0200	5.4
Short Creek	TN06030003015_0200	5.8
Sinking Creek	TN06030003001_0500	11.6
Spring Creek	TN06030003035_0100	16.9
Stephens Creek	TN06030003010_0100	11.0
Stewart Creek	TN06030003010_0700	9.6
Swan Creek	TN06030003063_1000	5.6
Taylor Creek	TN06030003432_1000	9.1
Trussel Creek	TN06030003044_0730	4.3
Tucker Creek	TN06030003010_0200	14.6
Turkey Creek	TN06030003076_1000	6.2
Wells Creek	TN06030003010_0800	3.1

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

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Blue Creek	TN06030003053_0100	10.9
Blue Spring Creek	TN06030003051_0200	13.0
Childer Creek	TN06030003085_1000	8.9
Dry Creek	TN06030003026_1000	21.1
East Fork Mulberry Creek	TN06030003056_0300	16.8
Elk River	TN06030003015_1000	15.4
Elk River	TN06030003035_1000	6.2
Robinson Creek	TN06030003012_0400	23.0
Swan Creek	TN06030003063_2000	9.9
Wagner Creek	TN06030003032_1000	18.8

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

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Betsy Willis Creek	TN06030003044_0100	22.5
Cane Creek	TN06030003060_1000	44.5
Gum Creek	TN06030003552_1000	12.9
Hessey Branch	TN06030003567_1000	9.6
Patton Creek	TN06030003044_0200	4.2
Rock Creek	TN06030003053_2000	16.1
Rollins Creek	TN06030003435_1000	11.9
Yellow Branch	TN06030003041_0100	7.1

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

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Bee Spring Branch	TN06030003065_0500	2.6
Bell Branch	TN06030003065_0400	3.4
Birdsong Branch	TN06030003065_0200	5.8
Brown Branch	TN06030003065_0100	3.8
Buchanon Creek	TN06030003060_0900	11.9
Chicken Creek	TN06030003064_0500	15.4
Corn Branch	TN06030003044_0620	5.3
Craighead Creek	TN06030003060_0200	13.7
Dry Creek	TN06030003044_0710	8.7
Dyer Branch	TN06030003063_0200	7.2
East Fork Bradshaw Creek	TN06030003064_0400	21
Elk River	TN06030003044_3000	10.1
Flatrock Branch	TN06030003044_0610	6.0
Gimlet Creek	TN06030003056_0110	10.3
Gingerbread Creek	TN06030003060_0800	6.7
Good Branch	TN06030003056_0420	5.5
Hannah Gap Branch	TN06030003060_0710	13
Hayes Branch	TN06030003060_0100	3.4
Indian Camp Creek	TN06030003044_0500	6.0
Keith Cove Creek	TN06030003030_0100	12.4
Leatherwood Creek	TN06030003064_0600	6.0
Little Bradshaw Creek	TN06030003064_0200	17.5
Little Cane Creek	TN06030003060_0700	15.9
Little Creek	TN06030003064_0100	6.6
Little Swan Creek	TN06030003063_0400	11.6
Louse Creek	TN06030003056_0330	2.7
McAfee Creek	TN06030003063_0100	10.0
Middle Cane Creek	TN06030003060_0500	7.6
Misc Tribs to Swan Creek	TN06030003063_0999	25.0
Misc. Tribs	TN06030003001_0999	64.2
Misc. Tribs	TN06030003015_0999	11.9
Misc. tribs	TN06030003044_0999	29.1
Misc. tribs to Beans Creek	TN06030003012_0999	26.3
Misc. Tribs to Woods Reservoir	TN06030003036T_1000	14.3
Misc. tribs.	TN06030003010_0999	31.2
Morton Branch	TN06030003063_0300	5.9
Negro Den Creek	TN06030003044_0410	9.3
Negro Den Creek	TN06030003044_0400	1.6
Pinnel Creek	TN06030003006_0100	11.3
Pitts Branch	TN06030003056_0320	4.1
Pleasant Valley Creek	TN06030003060_0300	23.5
Price Creek	TN06030003056_0310	7.0
Reeves Branch	TN06030003001_0100	4.1
Sally Creek	TN06030003044_0630	7.2
Saunders Creek	TN06030003060_0600	5.5
Snuff Branch	TN06030003065_0300	9.2
Stone Creek	TN06030003056_0410	11.5
Tims Ford Misc. Tribs	TN06030003016T_1000	30.1

Wabash Creek	TN06030003056_0210	3.8
West Cane Creek	TN06030003060_0400	20.5
West Fork Bradshaw Creek	TN06030003064_0300	15.5

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

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
Tims Ford Reservoir	TN06030003016_1000	10596

Table A3-1e. Fully Supporting Lakes in Upper Elk River Watershed. *Data are based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
Woods Reservoir	TN06030003036_1000	3908

Table A3-1f. Lakes Not Supporting Designated Uses in Upper Elk River Watershed. *Data are based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Betsy Willis Creek	TN06030003044_0100	22.5	Not supporting
Blue Spring Creek	TN06030003051_0200	13.0	Partial
Gum Creek	TN06030003552_1000	12.9	Not supporting
Patton Creek	TN06030003044_0200	4.2	Not supporting
Wagner Creek	TN06030003032_1000	18.8	Partial
Yellow Branch	TN06030003041_0100	7.1	Not supporting

Table A3-2a. Stream Impairment Due to Habitat Alterations in Upper Elk River Watershed. *Data are based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Dry Creek	TN06030003026_1000	21.1	Partial
East Fork Mulberry Creek	TN06030003056_0300	16.8	Partial
Elk River	TN06030003035_1000	6.2	Partial
Rock Creek	TN06030003053_2000	16.1	Not supporting
Swan Creek	TN06030003063_2000	9.9	Partial

Table A3-2b. Stream Impairment Due to Organic Enrichment/Low Dissolved Oxygen Levels in Upper Elk River Watershed. *Data are based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Cane Creek	TN06030003060_1000	44.5	Not supporting
Swan Creek	TN06030003063_2000	9.9	Partial

Table A3-2c. Stream Impairment Due to Pathogens in Upper Elk River Watershed. *Data are based on Year 2000 Water Quality Assessment.*

SEGMENT NAME	WATERBODY SEGMENT ID	SIZE (MILES)	SUPPORT DESCRIPTION
Betsy Willis Creek	TN06030003044_0100	22.5	Not supporting
Childer Creek	TN06030003085_1000	8.9	Partial
East Fork Mulberry Creek	TN06030003056_0300	16.8	Partial
Gum Creek	TN06030003552_1000	12.9	Not supporting
Hessey Branch	TN06030003567_1000	9.6	Not supporting
Patton Creek	TN06030003044_0200	4.2	Not supporting
Robinson Creek	TN06030003012_0400	23.0	Partial
Rock Creek	TN06030003053_2000	16.1	Not supporting
Yellow Branch	TN06030003041_0100	7.1	Not supporting

Table A3-2d. Stream Impairment Due to Siltation in Upper Elk River Watershed. *Data are based on Year 2000 Water Quality Assessment.*

APPENDIX IV

LAND USE/LAND COVER	AREAS IN HUC-10 SUBWATERSHEDS (ACRES)				
	01	02	03	04	05
Deciduous Forest	42,561	41,969	40,815	20,460	40,465
Emergent Herbaceous Wetlands	44	258	157	195	
Evergreen Forest	1,904	2,155	2,910	1,818	8,047
High Intensity: Commercial/Industrial/Transportation	226	701	1,481	641	508
High Intensity: Residential	7	5	371	328	175
Low Intensity: Residential	185	285	1,879	1,347	959
Mixed Forest	3,673	4,840	7,618	5,474	21,370
Open Water	89	4,089	8,938	1,093	1,308
Other Grasses: Urban/Recreational	28	213	1,536	1,024	628
Pasture/Hay	5,705	21,540	22,787	18,080	32,364
Row Crops	3,223	26,889	16,142	14,768	8,739
Transitional	272	237	320	38	183
Woody Wetlands	824	4,215	2,565	2,151	84
Quarries/Strip Mines		169	25	77	44
Total	**58,740**	**107,565**	**107,546**	**67,495**	**114,874**

LAND USE/LAND COVER	AREAS IN HUC-10 SUBWATERSHEDS (ACRES)			
	06	07	08	09
Deciduous Forest	16,782	20,315	17,328	60,846
Emergent Herbaceous Wetlands	30		2	180
Evergreen Forest	1,344	4,855	5,206	11,319
High Intensity: Commercial/Industrial/Transportation	183	107	128	438
High Intensity: Residential	9	9	14	14
Low Intensity: Residential	435	131	208	359
Mixed Forest	4,883	11,711	14,060	31,214
Open Water	121	12	22	1,613
Other Grasses: Urban/Recreational	284	30	167	80
Pasture/Hay	16,404	21,776	24,403	57,469
Row Crops	14,202	4,763	5,586	14,448
Transitional	55	13	36	376
Woody Wetlands	490		459	59
Quarries/Strip Mines		56	32	45
Total	**55,221**	**63,780**	**67,650**	**178,460**

Table A4-1. Land Use Distribution in the Upper Elk River Watershed by HUC-10. *Data are from 1992 Multi-Resolution Land Characterization (MRLC) derived by applying a generalized Anderson Level II system to mosaics of Landsat thematic mapper images collected every five years.*

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

Table A4-2. Hydrologic Soil Groups in Tennessee as Described in WCS.

STATION	HUC-10	AGENCY	NAME	AREA (SQ MILES)	LOW FLOW (CFS)		
					1Q10	7Q10	3Q20
03578000	0603000301	USGS	Elk River	65.6	1.36	1.50	1.12
03578500	0603000302	USGS	Bradley Creek	41.3	3.2	4.4	3.0
03579000	0603000302	USGS	Woods Reservoir				
03579100	0603000303	USGS	Elk River	275.0	19.3	21.5	17.9
03579500	0603000303	USGS	Elk River				
03579800	0603000304	USGS	Miller Creek	4.30			0
03579900	0603000304	USGS	Boiling Fork Creek	17.0	0.15	0.18	0.11
03582200	0603000305	USGS	Trib to Norris Creek				
03582205	0603000305	USGS	Norris Creek	15.1			0
351144086164401	0603000305	TVA	Tims Ford Dam Tailwater				
03580750	0603000305	USGS	Elk River				
03582300	0603000305	USGS	Norris Creek				
03582395	0603000305	USGS	Tanyard Branch				
350832086341001	0603000305	TVA	Elk River				
03582000	0603000305	USGS	Elk River	827.0	95.2	168	112
03580990	0603000307	USGS	Jack Daniel Spring				
03581000	0603000307	USGS	East Fork Mulberry Creek	23.4	2.01	2.23	1.88
03581500	0603000307	USGS	West Fork Mulberry Creek	41.2			0
03582591	0603000308	USGS	Cane Creek	93.0			0
03582600	0603000308	USGS	Cane Creek				
03582646	0603000309	USGS	Swan Creek	22.5			0
03583000	0603000309	USGS	Bradshaw Creek	36.5	0	0	0
03583200	0603000309	USGS	Chicken Creek				

Table A4-3. Historical Streamflow Data Summary Based on Mean Daily Flows in Upper Elk River Watershed*. USGS, United States Geological Survey; TVA, Tennessee Valley Authority.*

PARAMETER	SUBWATERSHED							
	01	02	03	04	05	07	08	09
E. coli	A, B	K	◊		▼		K	+
Fecal Coliform	A, B, C, D	K	◊		▼	▲▼	K	+
Fecal Streptococcus	C							
Enterococcus	B	K	◊		▼		K	+
Total Coliform	A, B				▼		K	+
Acidity								
Alkalinity (Total)	A, B	K	◊			▲▼	K	
BOD_5	C, D			~	↔			+
Color (Apparent)	C	K	◊				K	
Color (True)	C	K	◊				K	
Conductivity (Field)	C, D	K	◊	~	▼, ↔	▲▼	K	+
COD (Low)					▼			
DO	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	+
Flow	B		◊				K	+
Hardness (Total)	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	
pH (Field)	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	+
pH (Lab)	C, D							
Residue (Dissolved)	A, B, C, D	K	◊		▼	▲▼	K	
Residue (Settlable)	A, B				↔			+
Residue (Suspended)	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	+
Residue (Total)	B, C, D							
Temperature	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	+
Turbidity	A, B	K	◊			▲▼	K	+
Biorecon	A, B	K	◊		▼	▲▼		
RBP III		K	◊				K	
Ag	C, D			~	↔			
Al	A, B, C							
Ammonia N	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	+
As	A, B, C	K	◊		▼	▲▼	K	
Cd	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	
Cl^-		K	◊			▲▼		
CN^-	A, B	K	◊			▲▼		
Cr (Total)	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	
Cu	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	
Fe	A, B, C	K	◊		▼	▲▼	K	
Hg	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	
Mn	A, B, C	K	◊		▼	▲▼	K	
N (Total Kjeldahl)	A, B	K	◊		▼	▲▼	K	+
Ni	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	
NO_2	B							
NO_3	B							
NO_2+NO_3	A, B	K	◊		▼	▲▼	K	+
P (Total)	A, B	K	◊		▼	▲▼	K	+
Pb	A, B, C, D	K	◊	~	▼, ↔	▲▼	K	
Se	A, B							

SO_4		K	◊			⬍		+
TOC	A, B	K	◊			⬍	K	
TON	B							
Zn	A, B, C, D	K	◊	~	▼, ↔	⬍	K	

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

CODE	STATION	ALIAS	AGENCY	LOCATION
A	GILLI001.4GY		TDEC	Gilliam Creek @RM 1.4
B	GILLI001.7GY		TDEC	Gilliam Creek @ RM 1.7
C	GILLIAMTRIB@1.5		TDEC	Unnamed Trib to Gilliam Creek @ RM 1.5
D	TRUSSELTRIB@1.1		TDEC	Unnamed Trib to Trussel Creek @ RM 1.1
E	BRADL000.0CE	TISSUE23	TDEC	Bradley Creek @ RM 0.0
F	BRUMA000.0FR	TISSUE24	TDEC	Brumalow Creek @ RM 0.0
G	ROLLI000.0FR	TISSUE25	TDEC	Rollins Creek @ RM 0.0
H	WOODSRES01		TDEC	Woods Reservoir
I	WOODSRES02		TDEC	Woods Reservoir
J	WOODSRES03		TDEC	Woods Reservoir
K	ECO68C13		TDEC	Mud Creek @ RM 5.6
L	ROCK010.0FR	002290	TDEC	Rock Creek @ RM 10.1
M	ROCK010.2BE	ROCKCREEKIS04	TDEC	Rock Creek @ RM 10.2
N	ROCK010.3FR	ROCKCREEKIS20	TDEC	Rock Creek @ RM 10.3
O	ROCK010.4FR	002280	TDEC	Rock Creek @ RM 10.4
P	ROCK010.5CE	ROCKCREEKIS27	TDEC	Rock Creek @ RM 10.5
Q	ROCK010.6FR	ROCKCREEKIS21	TDEC	Rock Creek @ RM 10.6
R	ROCK010.75FR	002270	TDEC	Rock Creek @ RM 10.75
S	ROCK010.85FR	002260	TDEC	Rock Creek @ RM 10.85
T	ROCK010.8BE	03	TDEC	Rock Creek @ RM 10.8
U	ROCK011.3BE	01	TDEC	Rock Creek @ RM 11.3
V	ROCK011.5FR	002250	TDEC	Rock Creek @ RM 11.5
W	ROCK011.8CE	ROCKCREEKIS23	TDEC	Rock Creek @ RM 11.8
X	ROCK012.0CE	ROCKCREEKIS24	TDEC	Rock Creek @ RM 12.0
Y	ROCK012.8CE	ROCKCREEKIS25	TDEC	Rock Creek @ RM 12.8
Z	ROCK012.9CE	ROCKCREEKIS26	TDEC	Rock Creek @ RM 12.9
$	ELK169.9FR	TISSUE26	TDEC	Elk River @ RM 169.9
α	POORH000.1FR	002170	TDEC	Poorhouse Creek @ RM 0.1
β	ROCK003.4FR	002360	TDEC	Rock Creek @ RM 3.4
γ	ROCK003.5FR	ROCKCREEKIS15	TDEC	Rock Creek @ RM 3.5
δ	ROCK005.2FR	002350	TDEC	Rock Creek @ RM 5.2
λ	ROCK005.7FR	ROCKCREEKIS14	TDEC	Rock Creek @ RM5.7
π	ROCK006.6FR	ROCKCREEKIS13	TDEC	Rock Creek @ RM 6.6
ψ	ROCK006.8FR	002340	TDEC	Rock Creek @ RM 6.8
■	ROCK006.9FR	ROCKCREEKIS12	TDEC	Rock Creek @ RM 6.9
▲	ROCK007.2FR	ROCKCREEKIS11	TDEC	Rock Creek @ RM7.2
♠	ROCK007.7FR	002330	TDEC	Rock Creek @ RM 7.7
♣	ROCK007.9FR	002320	TDEC	Rock Creek @ RM 7.9
♥	ROCK008.1FR	ROCKCREEKIS10	TDEC	Rock Creek @ RM 8.1
♦	ROCK008.2FR	ROCKCREEKIS18	TDEC	Rock Creek @ RM 8.2
♫	ROCK008.4FR	ROCKCREEKIS09	TDEC	Rock Creek @ RM 8.4
Ω	ROCK008.6FR	ROCKCREEKIS08	TDEC	Rock Creek @ RM 8.6
∆	ROCK009.1BE	ROCKCREEKIS07	TDEC	Rock Creek @ RM 9.1
√	ROCK009.2CE	02310	TDEC	Rock Creek @ RM 9.2
¥	ROCK009.3FR	ROCKCREEKIS19	TDEC	Rock Creek @ RM 9.3
£	ROCK009.8BE	ROCKCREEKIS06	TDEC	Rock Creek @ RM 9.8
@	ROCK010.05FR	002300	TDEC	Rock Creek @ RM 10.05
&	ROCK010.0BE	ROCKCREEKIS05	TDEC	Rock Creek @ RM 10.0

¢	03579620		USGS	Rock Creek @ Tullahoma
§	03580681		USGS	Hurricane Creek @ Motlow State CC
±	03580684		USGS	Hurricane Creek below Motlow state CC
≠	03580688		USGS	Hurricane Creek near Raysville
≡	475768		TVA	Tims Ford Reservoir
≤	477072		TVA	Tims Ford Reservoir
≥	477415		TVA	Tims Ford Reservoir @ Estill Springs Park
□	477635		TVA	Tims Ford Reservoir
◊	ECO71G10		TDEC	Hurricane Creek @ RM 9.4
»	ROCK011.0		TDEC	Rock Creek @ RM 11.0
Φ	WAGNE001.6FR	WAGNERCRIS03	TDEC	Wagner Creek @ RM 1.6
₪	WAGNE002.7FR	WAGNERCRIS01	TDEC	Wagner Creek @ RM 2.7
€	477416		TVA	
~	BOILINGFK013.6		TDEC	Boiling Fork Creek @ RM 13.6
?	WAGNER002.5		TDEC	Wagner Creek @ RM 2.5
#	COFFE001.1MR	MULBERRYIS03	TDEC	Coffee Creek @ RM 1.1
%	475050		TVA	
¶	475623		TVA	
►	475687		TVA	Tims Ford Dam Scrollcase
Ж	475687C		TVA	Tims Ford Dam Taildeck (Continuous)
ĺ	476831		TVA	Tims Ford Tailrace
☼	476831C		TVA	Tims Ford Wet Well (Continuous)
╬	477619		TVA	Unnamed Trib to Tims Ford Tailrace
©	477651		TVA	Tims Ford Dam Forebay
▼	ELK133.0FR	001207	TDEC	Elk River below Tims Ford Dam
↔	ELK093.9		TDEC	Elk River @ RM 93.9
H	EFMUL006.3MR	MULBERRYIS02	TDEC	East Fork Mulberry Creek @ RM 6.3
°	EFMUL014.3MR	MULBERRYIS01	TDEC	East Fork Mulberry Creek @ RM 14.3
♦	WFMUL001.9LI	ECO71H12	TDEC	West Fork Mulberry Creek @ RM 1.9
J	WFMUL008.6MR	MULBERRY1S04	TDEC	West Fork Mulberry Creek @ RM 8.6
:	03580995		USGS	
(	EFKMULBERY11.1		TDEC	East Fork Mulberry Creek @ RM 11.1
K	BUSHM002.2RU		TDEC	Bushman Creek @ RM 2.2
+	SWAN008.1LI		TDEC	Swan Creek @ RM 8.1

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

FACILITY NUMBER	FACILITY NAME	SIC	SIC NAME	MADI	WATERBODY	HUC-10
TN0021806	Monteagle STP #1	4952	Sewerage System	Minor	Unnamed Trib @ RM 1.3 to Gilliam Creek	0603000301
TN0064815	Monteagle STP #2	4952	Sewerage System	Minor	Unnamed Trib @ RM 1.0 to Trussel Creek	0603000301
TN0003751	Arnold Engineering Development Center	9711	National Security	Major	Unnamed Tribs to Rowland, Bradley , Spring, and Brumalow, Creeks, and to Woods Reservoir	0603000302
TN0067202	UT Space Institute	4952	Sewerage System	Minor	Rollins Creek Embayment of Woods Reservoir	0603000302
TN0056430	UT Space Institute	8221	Colleges and Universities	Minor	Rollins Creek @ RM 1.1	0603000302
TN0021857	Winchester STP	4952	Sewerage System	Major	Elk River @ RM 153.8	0603000303
TN0023469	Tullahoma STP	4952	Sewerage System	Major	Rock Creek @ RM 11.0	0603000303
TN0027766	Tims Ford STP	4952	Sewerage System	Minor	Elk River @ RM 136.2	0603000303
TN0020508	Decherd STP	4952	Sewerage System	Minor	Wagner Creek @ RM 2.4	0603000304
TN0021644	Cowan STP	4952	Sewerage System	Minor	Boiling Fork Creek @ RM13.4	0603000304
TN0021814	Fayetteville STP	4952	Sewerage System	Major	Elk River @ RM 90.0	0603000305
TN0005037	TN Game and Fish @ Flintville	0921	Fish Hatcheries	Minor	Shelton Branch @ RM 4.0	0603000305
TN0027537	Tims Ford Hydro Plant (TVA)	4911	Hydroelectric Power Generation	Minor	Elk River @ RM 133.3	0603000305
TN0001953	Jack Daniel Distillery	2085	Distilled and Blended Liquors	Minor	East Fork Mulberry Creek @ RM 12.9 and RM 13.3	0603000307
TN0025101	Lynchburg STP	4952	Sewerage System	Minor	East Fork Mulberry Creek @ RM 11.1	0603000307
TN0076007	Elkton STP	8211	Elementary and Secondary Schools	Minor	Elk River @ RM 49.2	0603000309
TN0065498	Unity Junior HS	4952	Sewerage System	Minor	Morton Branch @ RM 1.0	0603000309
TN0074331	I-65 Welcome Center	4952	Sewerage System	Minor	Elk River @ RM 49.2	0603000309

Table A4-5. Active Permitted Point Source Facilities in the Upper Elk River Watershed. *SIC, Standard Industrial Classification; MADI, Major Discharge Indicator.*

FACILITY NUMBER	PERMITEE	SIC	SIC NAME	WATERBODY	HUC-10
TN0066541	Rogers Group	1422	Crushed and Broken Limestone	Unnamed Trib to Jay Creek	0603000301
TN0066028	Coffee County Hwy Dept	1422	Crushed and Broken Limestone	Unnamed Trib to Betsy Willis Creek	0603000302
TN0071781	Cumberland Mtn Sand Co.	1442	Construction Sand and Gravel	Unnamed Trib to Betsy Willis Ck	0603000302
TN0065986	Rogers Group	1422	Crushed and Broken Limestone	Unnamed Trib to Beans Creek	0603000302
TN0068951	Franklin County Hwy Dept	1422	Crushed and Broken Limestone	Hessey Branch	0603000303
TN0066311	Rogers Group	1422	Crushed and Broken Limestone	Unnamed Trib to Boiling Fork Ck	0603000304
TN0070874	Rogers Group	1422	Crushed and Broken Limestone	Norris Creek	0603000305
TN0076171	HMA Contractors	1422	Crushed and Broken Limestone	Unnamed Trib To Elk River	0603000305
TN0066273	Rogers Group	1422	Crushed and Broken Limestone	Unnamed Trib to Price Branch	0603000307
TN0070815	Burgreen Contracting Co.	1422	Crushed and Broken Limestone	Elk River	0603000309
TN0066176	Lincoln County Hwy Dept	1422	Crushed and Broken Limestone	Unnamed Trib to Elk River	0603000309

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

FACILITY NUMBER	FACILITY NAME	SECTOR	RECEIVING STREAM	AREA*	HUC-10
TNR053487	Arnold Engineering Development Center	AA	Unnamed Trib to Brumalow Creek	0.9	0603000302
TNR054377	C.D. Dalton Lumber Company	A	Rock Creek	30.7	0603000302
TNR050176	Tyson Foods, Incorporated	U, P	Taylor Creek Tims Ford lake	36.0	0603000303
TNR050415	Universal Technologies, Inc.	AA	Tims Ford lake	2.7	0603000303
TNR050797	Wilson Sporting Goods Co.	Y	Rock Creek	3.6	0603000303
TNR050989	Precision Systems Division	AC	Old Rock Creek	10.0	0603000303
TNR051205	Schmiede Corporation	AB	Norman Creek	80.0	0603000303
TNR051840	Lannom Tannery Landfill	Z	Dry Creek	8.5	0603000303
TNR053290	Tullahoma Regional Airport	S	NF and SF Rock Creek	5.0	0603000303
TNR053596	Deutch	AC	Harton Creek	11.0	0603000303
TNR053599	Tennessee Tanning Company	Z	Tullahoma MS4	4.0	0603000303
TNR053613	Baseball Factory	Y, V	Norman Creek, NF Rock Creek	10.7	0603000303
TNR053614	Worth Bat Company	Y	Rock Creek	16.0	0603000303
TNR053640	Lannon Tannery Hide House	Z	Dry Creek	3.3	0603000303
TNR053683	Rock-Tenn Company	B	Tullahoma MS4	2.7	0603000303
TNR050264	Columbian TecTank	AA	Unnamed Trib to Tims Ford lake	3.0	0603000304
TNR050619	Winchester Radiator	M	Boiling Fork Creek	7.5	0603000304
TNR051438	Del-Met TN, Incorporated	Y	Wagner Creek	9.1	0603000304
TNR052092	Tepro, Incorporated	Y	Boiling Fork Creek	7.0	0603000304
TNR053297	Shaw Industries, Incorporated	V	None (Wooded Property)	86.1	0603000304
TNR053312	Winchester Municipal Airport	S	Boiling Fork Creek	135.0	0603000304
TNR053453	Nissan Powertrain Assembly	AB	Sinkholes	35.0	0603000304
TNR054324	Diversatech Plastics	Y	Boiling Fork Creek	9.2	0603000304
TNR050123	Small & Small Oil Company	P	Norris Creek	0.4	0603000305
TNR050525	Frito-Lay, Incorporated	U	Unnamed Trib to Elk River	777.0	0603000305
TNR050634	Stovall Body Shop	M	Unnamed Trib to Elk River	6.0	0603000305
TNR051007	Goodman Company	AB	Unnamed Trib to Elk River	52.0	0603000305
TNR054051	VAW of America, Incorporated	AA	Elk River Chenault Ford Creek	30.0	0603000305
TNR054289	WW Iron Works, Incorporated	AA	Unnamed Trib to Elk River	2.0	0603000305
TNR055027	Caldwell Chemical Coatings	C	Unnamed Trib to Elk River	5.0	0603000305
TNR054536	Thompson Appalachian Hardwoods	A	Mathis Creek	17.0	0603000306
TNR054588	Elora Pallet Shop	A	Persimmon Creek	1.0	0603000306
TNR050887	Jack Daniels Distillery	L, A, P	EF Mulberry Creek Unnamed Trib to EF Mulberry Creek	243.4	0603000307

TNR053035	Lincoln Road Builders, Inc.	D	Unnamed Trib to Price Branch	0.5	0603000307
TNR050143	Bradford Auto Salvage	M		3.0	0603000308
TNR050149	Melvin's Truck Center	M, N, P	Cold Water Creek	12.0	0603000308
TNR051165	Creson Body Shop	M	Unnamed Trib to Craighead Creek		0603000308
TNR051173	Honea's Garage	M, P	Cold Water Creek	14.0	0603000308
TNR051481	The Car Shoppe	M	Walker Creek	25.0	0603000308
TNR051950	Fayetteville Hot Mix Plant	D	Cane Creek	12.0	0603000308
TNR054309	Summa Technology, Inc.	AB, AA	Buchanan Creek	8.5	0603000308

Table A4-7. Active Permitted TMSP Facilities in the Upper Elk River Watershed. *Area, acres of property associatedwith industrial activity. Sector details may be founding Table A4-8.*

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

Table A4-8. TMSP Sectors and Descriptions.

FACILITY NUMBER	PERMITEE	COUNTY	LIVESTOCK	WATERBODY	HUC-10
TNA000034	Cowan Poultry	Franklin	Poultry	Norwood Creek	0603000304
TNA000010	C&L Dairy	Lincoln	Dairy	Turkey Branch	0603000309
TNA000057	Stubblefield Dairy	Lincoln	Dairy	Chicken Creek	0603000309

Table A4-9. CAFO Sites in the Upper Elk River Watershed.

LOG NUMBER	COUNTY	DESCRIPTION	WATERBODY	HUC-10
98.592	Grundy	Debris Removal	Patton Creek	0603000301
97.719	Coffee	Culvert	Blue Spring Creek	0603000302
94.796	Coffee/Franklin	Gravel Dredging	Rock Creek	0603000303
96.036	Moore	Driveway Crossing	Hurricane Creek	0603000303
96.037	Moore		Hurricane Creek	0603000303
96.327	Franklin	Bridge Replacement	Dry Creek	0603000303
96.486	Franklin	Bridge Replacement	Dry Creek	0603000303
96.495	Moore		Hurricane Creek	0603000303
97.472	Coffee	Channel Relocation Box Culvert	Unnamed Trib to Upper Rock Ck	0603000303
97.538	Coffee	Utility Line Crossing	North Fork Rock Creek	0603000303
97.569	Coffee	Water/Sewer Line	North Fork Rock Creek	0603000303
97.761	Coffee	Sewer Line Crossing	West Fork Rock Creek	0603000303
97.882	Coffee	Force Main	South Fork Blue Creek	0603000303
98.385	Coffee	Upgrade Wing Walls	Riley Creek	0603000303
98.400	Coffee	Bank Stabilization	North Fork Blue Creek	0603000303
98.483	Coffee	Stream Relocation	Unnamed Trib to Rock Creek	0603000303
9810.058	Franklin	Gravel Dredging	Rock Creek	0603000303
9810.059	Franklin	Gravel Dredging	Rock Creek	0603000303
9808.0011	Franklin	Waterline Crossing	Wagener Creek	0603000304
99.263	Franklin	Bank Stabilization	Blue Spring Creek	0603000304
94.186A	Moore	Gravel Dredging	Coffee Creek	0603000305
94.186B	Moore	Gravel Dredging	Coffee Creek	0603000305
94.186C	Moore	Gravel Dredging	Coffee Creek	0603000305
94.186D	Moore	Gravel Dredging	Coffee Creek	0603000305
95.433	Moore	Gravel Dredging	Dry Prong Farris Creek	0603000305
95.762	Lincoln	Gravel Dredging	Norris Creek	0603000305
96.035	Moore	Gravel Dredging	Hurricane Creek	0603000305
96.147	Wilson	Stream Relocation	Unnamed Trib to Sinking Creek	0603000305
96.347	Wilson	Rip-Rap	Vivrett Creek	0603000305
96.351	Moore	Bridge Replacement	Farris Creek	0603000305
96.605	Wilson	Pedestrian Walking	Sinking Creek	0603000305
96.856A	Lincoln	Gravel Dredging	Elk River	0603000305
96.877	Lincoln	Debris Removal	Unnamed Trib to Elk River	0603000305
97.038	Lincoln	Gravel Dredging	Norris Creek	0603000305
97.066	Lincoln	NPDES Outfall	Elk River	0603000305
97.355	Wilson	Stream relocation	Unnamed Trib to Stone Creek	0603000305
97.598	Lincoln	Stream Relocation	Unnamed Trib to Norris Creek	0603000305
97.682	Lincoln	Gravel Dredging	Norris Creek	0603000305
98.034	Moore	Bridge Replacement	Bean Hollow Creek	0603000305
98.856C	Lincoln	Gravel Dredging	Elk River	0603000305
98.856D	Lincoln	Gravel Dredging	Elk River	0603000305

9810.057	Lincoln	Gravel Dredging	Norris Creek	0603000305
9810.091	Lincoln	Gravel Dredging	Norris Creek	0603000305
9810.092	Lincoln	Gravel Dredging	Norris Creek	0603000305
9810.159	Lincoln	Gravel Dredging	Little Norris Creek	0603000305
9810.245	Lincoln	Road Crossing	Norris Creek	0603000305
9810.246	Lincoln	Road Crossing	Tucker Creek	0603000305
9908.0010	Lincoln	Gravel Dredging	Norris Creek	0603000305
9910.022	Moore	Gravel Dredging	Wet Prong Creek	0603000305
9910.023	Moore	Gravel Dredging	Wet Prong Creek	0603000305
9910.024	Moore	Gravel Dredging	Bull Run Creek	0603000305
96.726	Franklin	Gravel Dredging	Caney Hollow Creek	0603000306
94.228A	Moore	Gravel Dredging	West Fork Mulberry Creek	0603000307
94.228B	Moore	Gravel Dredging	West Fork Mulberry Creek	0603000307
94.228C	Moore	Gravel Dredging	West Fork Mulberry Creek	0603000307
95.099	Moore	Gravel Dredging	Mulberry Creek	0603000307
96.024	Moore	Gravel Dredging	Bagle Hollow Creek	0603000307
96.034	Moore	Gravel Dredging	Goodbranch Creek	0603000307
96.189	Moore	Gravel Dredging	Mulberry Creek	0603000307
96.226	Lincoln	Gravel Dredging	East Fork Mulberry Creek	0603000307
96.264	Lincoln	Gravel Dredging	Booneville Creek	0603000307
96.323	Moore	Gravel Dredging	Mulberry Creek	0603000307
96.395	Moore	Gravel Dredging	Stone Creek/Dogtail Creek	0603000307
96.583	Lincoln	Gravel Dredging	Mulberry Creek	0603000307
96.725	Moore	Rip-Rap Replacement	Mulberry Creek	0603000307
97.560	Moore	Bank Stabilization	Unnamed Trib to Buckeye Creek	0603000307
97.718	Moore	Retaining Walls	East Fork Mulberry Creek	0603000307
97.845	Lincoln	Gravel Dredging	East Fork Mulberry Creek	0603000307
98.035	Moore	Bridge Replacement	Buckeye Creek	0603000307
9810.005	Lincoln	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.028	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.029	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.030	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.031	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.032	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.033	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.034	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.035	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.036	Moore	Gravel Dredging	Dogtail Creek	0603000307
9810.037	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.038	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.039	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.041	Lincoln	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.070	Moore	Gravel Dredging	East Fork Mulberry Creek Stone Creek	0603000307
9810.093	Lincoln	Gravel Dredging	Mulberry Creek	0603000307
9810.154	Moore	Driveway Crossing	Cave Hollow Spring	0603000307
9810.195	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.204	Lincoln	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.209	Lincoln	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.212	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.213	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307

9810.220	Moore	Gravel Dredging	Stone Creek	0603000307
9810.255	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.256	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.257	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9810.258	Moore	Gravel Dredging	East Fork Mulberry Creek	0603000307
9908.0015	Marshall	Road Crossing	Belfast Creek	0603000307
94.143	Lincoln	Gravel Dredging	Pleasant Valley Creek	0603000308
95.722	Marshall	Gravel Dredging	Cane Creek	0603000307
97.514	Lincoln	Culvert Replacement	Wells Branch	0603000307
98.291	Lincoln	Gas Line	Cane Creek	0603000307
9808.0000	Lincoln	Gravel Dredging	Cane Creek	0603000307
9810.199	Lincoln	Gravel Dredging	Cane Creek	0603000307
9908.027	Lincoln	Gravel Dredging	Cane Creek, Unnamed Trib to Cane Creek	0603000307
94.033	Giles	Bank Stabilization	Bee Spring Branch	0603000309
94.054C	Lincoln	Gravel Dredging	Tackett Branch Creek	0603000309
94.054G	Lincoln	Gravel Dredging	Yellow Branch Creek	0603000309
94.189	Giles	Gravel Dredging	Indian Creek	0603000309
94.383	Giles	Gravel Dredging	Bradshaw Creek	0603000309
94.383A	Giles	Gravel Dredging	Bradshaw Creek	0603000309
94.383B	Giles	Gravel Dredging	Bradshaw Creek	0603000309
94.454	Giles	Gravel Dredging	Indian Creek	0603000309
95.086	Giles	Gravel Dredging	Indian Creek	0603000309
95.086A	Giles	Gravel Dredging	Indian Creek	0603000309
95.899	Lincoln	Gravel Dredging	Little Bradshaw Creek	0603000309
96.190	Giles	Gravel Dredging	Indian Creek	0603000309
96.232	Giles	Gravel Dredging	Gilliam Spring Branch	0603000309
96.487	Grundy	Bridge Replacement	Unnamed Trib to Spring Branch	0603000309
96.691	Marshall	Gravel Dredging	Unnamed Trib to East Fork Bradshaw Creek	0603000309
96.912	Giles	Culvert	Snuff Branch	0603000309
96.914	Lincoln	Gravel Dredging	Coldwater Creek	0603000309
97.242	Lincoln	Gravel Dredging	Swan Creek	0603000309
97.512	Lincoln	Culvert Replacement	East Fork Bradshaw Creek	0603000309
97.513	Lincoln	Culvert Replacement	Swan Creek	0603000309
97.570D	Giles	Gravel Dredging	Bradshaw Creek	0603000309
97.755	Giles	Gravel Dredging	Elk River	0603000309
9808.0001	Giles	Bank Stabilization	Snuff Branch	0603000309
9810.123	Giles	Gravel Dredging	Elk River	0603000309
99.227	Giles	Habitat Enhancement	Elk River	0603000309

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

APPENDIX V

CONSERVATION PRACTICE	UNITS	AMOUNT
Alley Cropping	Acres	0
Contour Buffer Strips	Acres	0
Crosswind Trap Strips	Acres	0
Field Borders	Feet	10,000
Filter Strips	Acres	52
Grassed Waterways	Acres	2
Riparian Forest Buffers	Acres	24
Streambank and Shoreline Protection	Feet	0
Windbreaks and Shelterbelts	Feet	0
Hedgerow Plantings	Feet	0
Herbaceous Wind Barriers	Feet	0
Total Conservation Buffers	Acres	83

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

PARAMETER	TOTAL
Erosion Reduction Applied (Acres)	3,909
Highly Erodible Land With Erosion Control Practices (Acres)	2,398
Estimated Annual Soil Saved By Erosion Control Measures (Tons/Year)	19,008
Total Estimated Soil Saved (Tons/Year)	19,008

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

PARAMETER	TOTAL
Acres of AFO Nutrient Management Applied	552
Acres of Non-AFO Nutrient Management Applied	2,945
Total Acres Applied	3,497

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

PARAMETER	TOTAL
Acres of Pest Management Systems Applied	3,319

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

CONSERVATION PRACTICE	ACRES
Acres Prepared for Revegetation of Forestland	0
Acres Improved Through Forest Stand Improvement	762
Acres of Tree and Shrub Establishment	86

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

CONSERVATION PRACTICE	ACRES
Acres of Wetlands Created or Restored	0
Acres of Wetlands Enhanced	64
Total Acres Created, Restored, or Enhanced	64

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

CONSERVATION PRACTICE	ACRES
Acres of Upland Habitat Management	319
Acres of Wetland Habitat Management	0
Total Acres Wildlife Habitat Management	319

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

COMMUNITY	PROJECT DESCRIPTION	AWARD DATE	AWARD AMOUNT
Monteagle	Wastewater Treatment Plant and Collection System	06/01/90	$1,310,000
Tullahoma	Wastewater Treatment Plant Upgrades and Collection System Rehabilitation	09/29/93	$10,207,000

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

NRCS CODE	PRACTICE	NUMBER OF BMPs
312	Animal Waste System	21
327	Conservation Cover	5
342	Critical Area Treatment	7
362	Diversion	5
371	Waste Storage Facility	1
378	Pond	14
382	Fencing	13
382a	Livestock Exclusion	3
382d	Fencing for Rotational Grazing System	1
410	Grade Stabilization Structure	1
412	Grassed Waterway	4
512	Pasture and Hayland Planting	110
512a	Cropland Conversion	3
516	Pipeline	3
558	Roof Run-off Management	1
561	Heavy Use Area	17
576	Stream Crossing	1
590	Nutrient Management	1
612	Tree Planting	3
614	Tank or Trough	12
614b	Alternative Watering System Spring Source	2
633	Waste Utilization	1
728	Stream Crossing	1
769	Incinerator	1

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