Document Type: EA-Administrative Record
Index Field: Final Environmental Document
Project Name: Columbus-DeKalb 161-kV TL – Tap to Paulette
Project Number: 2003-136

FINAL ENVIRONMENTAL ASSESSMENT

COLUMBUS-DEKALB 161-KV TRANSMISSION LINE – TAP TO PAULETTE

Noxubee County, Mississippi

TENNESSEE VALLEY AUTHORITY

DECEMBER 2003

Contact:

Anita E. Masters
Tennessee Valley Authority
1101 Market Street, MR 2T
Chattanooga, Tennessee 37402
Phone: (423) 751-8697
Fax: (423) 751-3230
e-mail: aemasters@tva.gov

Page intentionally blank

TABLE OF CONTENT

LIST OF APPENDIXES

LIST OF TABLES

LIST OF FIGURES

Page intentionally blank

CHAPTER 1

1. PURPOSE OF AND NEED FOR ACTION

1.1. Proposed Action: Improve Power Supply

Tennessee Valley Authority's (TVA) proposed action is to serve Four County Electric Power Association's (EPA) planned substation by building an approximately 8-mile, 161-kilovolt (kV) transmission line connection from the existing Columbus-DeKalb 161-kV Transmission Line to the new substation by July 2004 (Figure 1-1).

1.2. Need

Four County EPA provides electricity to a large service area in east-central Mississippi. The Noxubee County portion of its service area has recently experienced unprecedented growth in electric demand. A large part of this growth is due to increases in the number of catfish farms and related services. In 2001, there were 703 catfish farm accounts, of which 135 were added in that calendar year. Presently, another 3000 acres have been slated for catfish aquaculture development.

This increasing load is creating system loading and voltage problems on the Four County EPA system serving this area. Current planned development is expected to cause overloading by 2004 on the existing 13-kV system and two of the three substations that supply Noxubee County. These substations are currently served by TVA's Columbus-DeKalb 161-kV Transmission Line.

Reliability, as well as capacity, is a concern in providing for adequate service to the area. Since reliability decreases as loading increases, the peak load conditions predicted would result in a system even more likely to experience outage. To address these problems, Four County EPA is planning to build a new 161-kV substation on Paulette Road, southeast of Macon, Mississippi.

1.3. Objectives of the Noxubee County, Mississippi, Power Supply Improvement Project

To meet the projected Four County EPA power demand needs in the Noxubee County, Mississippi, area, TVA proposes to build a new 161-kV transmission line from the existing Columbus-DeKalb 161-kV Transmission Line to Four County EPA's new substation. One of the objectives of this new transmission line would be to supply additional electric load capacity to the Four County system where residential and commercial growth has increased the load demand.

Another objective of TVA's proposed new 161-kV transmission line would be to increase the system's reliability. Current growth projections anticipate an overloading of the Four County EPA system by ongoing and already planned development in this area. As early as 2004, power demand increases will reduce the Four County EPA system reliability resulting in increases in system outages, especially at times of high electricity use.

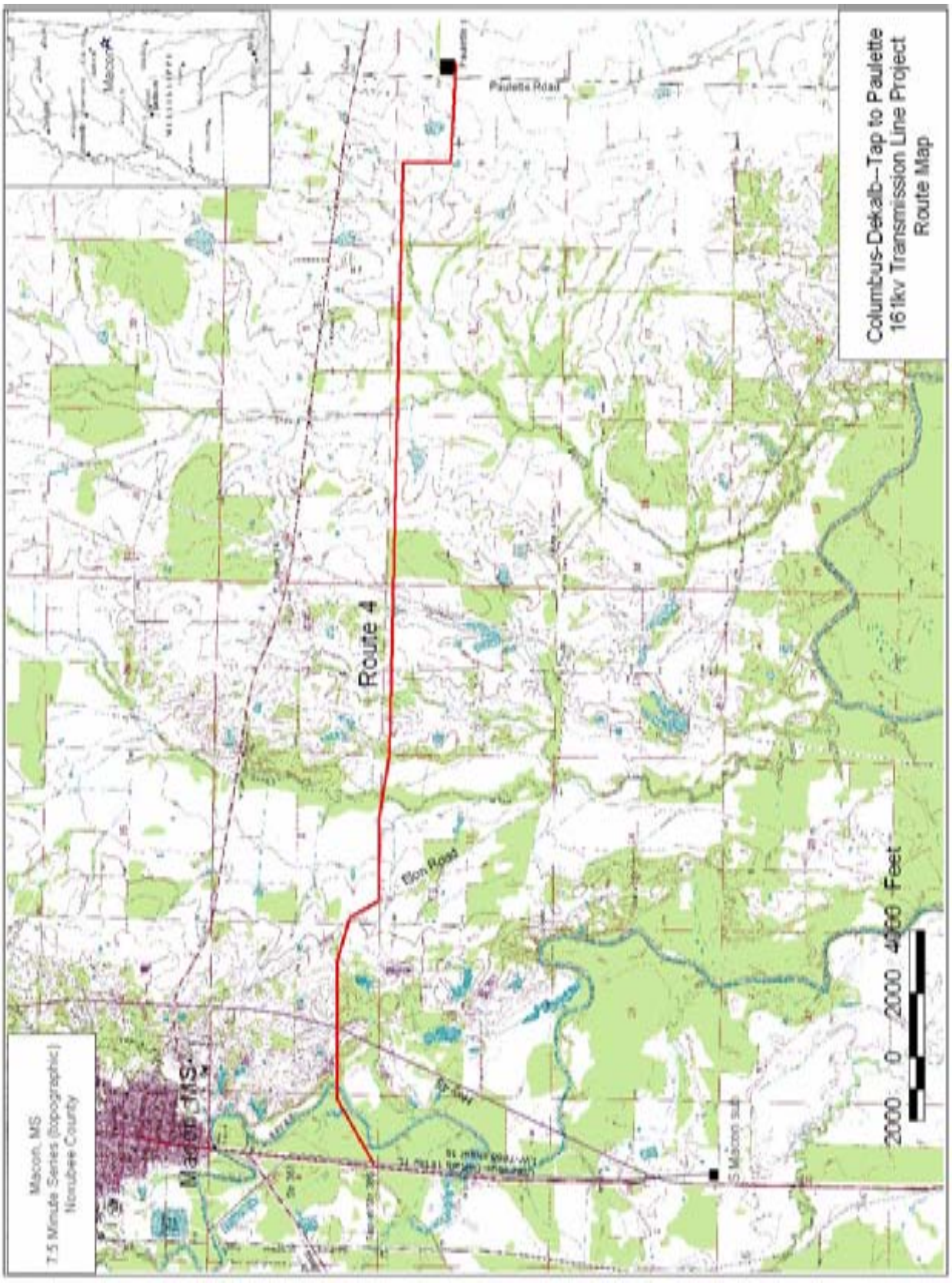

Figure 1-1. Columbus – De Kalb 161-kV Transmission Line, Tap to Paulette - Preferred Route and Tap Point

1.4. Decisions That Must be Made

TVA must decide whether to build a new 161-kV transmission line to improve the electrical service in the Four County EPA service area. This is described in detail in Section 2.2.

If service is improved, other specific decisions involve:

- Timing of the improvement.
- The best route for a transmission line.
- Necessary mitigation and/or monitoring measures that must be implemented to meet TVA standards and minimize resource damage.

TVA must also determine if the selected alternatives would or would not be a major Federal action significantly affecting the human environment. If TVA determines that it would not significantly affect the quality of the human environment, then TVA can prepare and sign a Finding of No Significant Impact, and the project can proceed.

If TVA determines that the selected alternative would significantly affect the quality of the human environment, then an Environmental Impact Statement and a Record of Decision must be prepared and signed before TVA could construct the proposed transmission line.

1.5. Public Involvement

The following Federal, state, and local agencies and other organizations have been contacted to date concerning this project by TVA in addition to internal reviews by a network of designated environmental specialists:

- United States Army Corps of Engineers
- United States Fish and Wildlife Service
- United States Senators and Representatives from the study area
- Noxubee County, Mississippi
- Bureau of Environmental Health, Mississippi State Board of Health
- Mississippi Public Service Commission
- Mississippi Department of Natural Resources
- Mississippi Historical Commission
- Mississippi Department of Transportation
- Mississippi Development Authority
- Water Quality Management Branch, State of Mississippi

This proposal was reviewed for consistency with Executive Order (EO) 11988 (Floodplain Management), EO 11990 (Protection of Wetlands), Farmland Protection Policy Act, National Historic Preservation Act, Endangered Species Act, Section 404 of the Clean Water Act, and EO 12372 (Intergovernmental Review). Correspondence received related to this coordination is contained in Appendix I.

TVA held a public information day in Macon, Mississippi, on June 25, 2002. This meeting presented five potential route alternatives to provide service as described in Section 2.5.3 of this document with one exception (Figure 1-2). The exception, which is identified as Route 4, was the short connection off Route 3 to the Columbus-DeKalb Transmission Line.

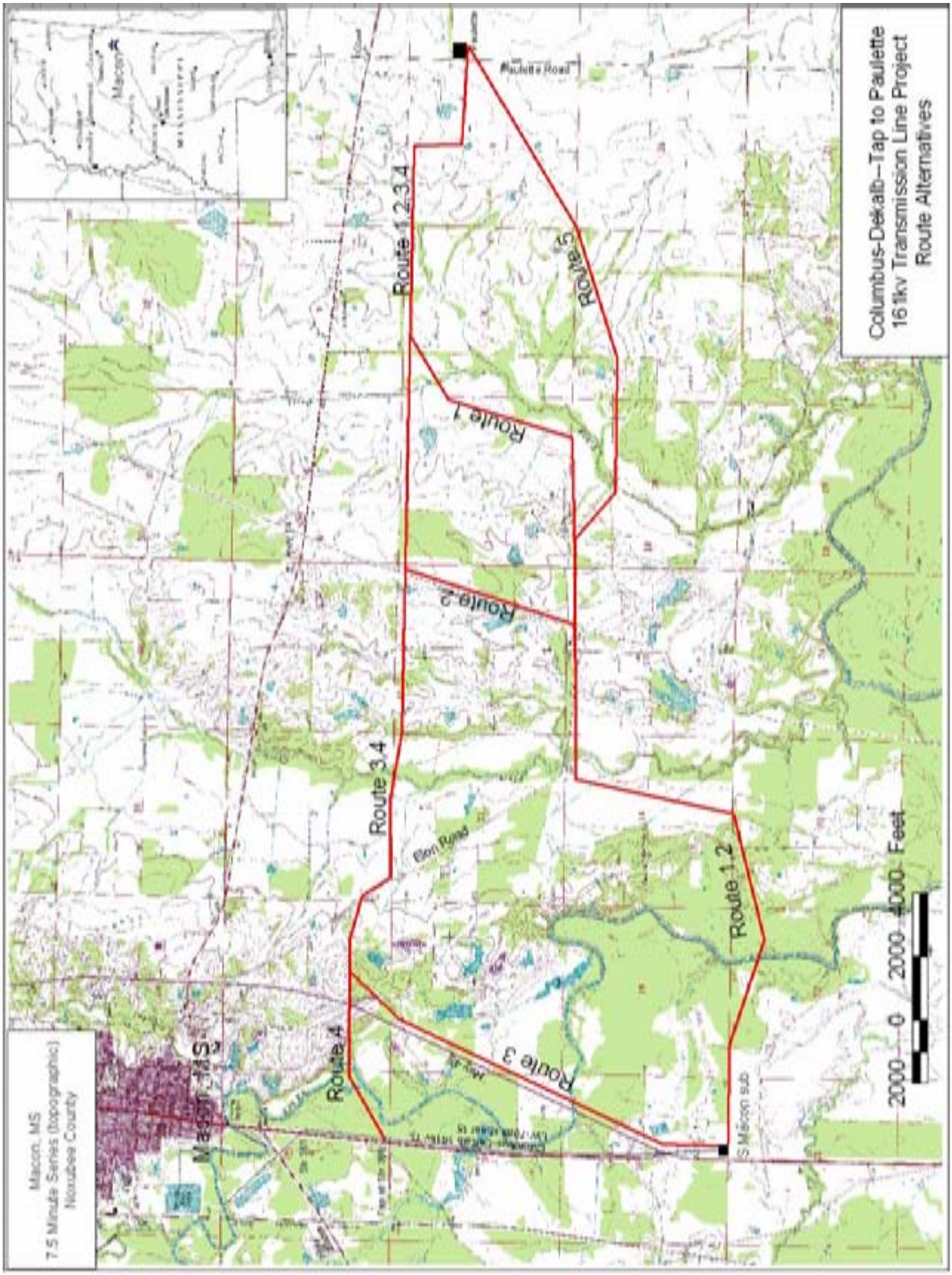

Figure 1-2. Columbus – De Kalb 161-kV Transmission Line, Tap to Paulette - Study Area and Route Alternatives

This route alternative was developed as a result of input at the public meeting, and was ultimately chosen as TVA's preferred connection.

Public officials and about 50 potentially affected property owners within these corridor routes were specifically invited, and newspaper advertisements invited any interested public as well. TVA issued a news release to local news outlets. Total attendance at this meeting was considered average for this type of project; approximately 36 individuals registered at the meeting. General owner comments were related to minimizing the impact to land usage.

During a 30-day public comment period following the open house, TVA accepted public comments on potential line routes and other issues. A toll-free phone number and FAX number were made available to facilitate comments. Comments were primarily related to the location of the transmission line relative to current or planned land uses. Several owners made routing suggestions that were utilized immediately, such as relocating the western portion of combined Route 3 and 4 southward of the section line to avoid cutting the trees marking that line (Figure 1-2). Many provided information and land use updates providing a more complete understanding of routing issues and usage constraints. As a result of the comments received, a new system connection point and transmission line route alternative were developed. This connection point and transmission line route alternative were eventually selected as TVA's preferred alternative.

1.6. Necessary Federal Permits or Licenses

Permits would be required from the state of Mississippi and United States Army Corps of Engineers (USACE) for the transmission line construction. The USACE has issued a Section 404 Nationwide Permit #12 - Utility Line Crossing for the project. Permits would be required from the state of Mississippi for construction site storm water discharge for the transmission line construction. The erosion and sedimentation control plans included in the storm water permit would be coordinated with the other appropriate state and local authorities. A permit would also be required for burning trees and other combustible materials removed during transmission line construction.

Page intentionally blank

CHAPTER 2

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Introduction

Chapter 2: Alternatives Including the Proposed Action is the *heart* of this Environmental Assessment. This chapter has the following six major sections:

- Description of Alternatives
- Alternative Eliminated From Detailed Study
- Description of Construction, Operation, and Maintenance of the Proposed 161-kV Transmission Line
- Project and Siting Alternatives
- Identification of the Preferred Alternative
- Summary of TVA Commitments and Proposed Mitigation Measures

2.2. Description of Alternatives

2.2.1. Alternative 1 – Do Not Build Additional Transmission Line (No Action)

Under this alternative, TVA would not construct a new transmission line. As a result, the increasing load due to ongoing and already planned development could not be met by Four County EPA, and system outages, especially at times of high electricity use, would occur or some other action would have to be taken. As described in Section 2.3 and 4.2, Four County EPA could respond by increasing the capacity at the South Macon 161-kV Substation, converting the circuits on 10 miles of an existing line, and constructing an additional 7.5 miles of transmission line from its substation at Shuqualak to the South Macon Substation. Either the No Action Alternative would not meet the identified needs and objectives of this proposal or, depending on Four County EPA's action, would result in similar impacts and would be more costly.

2.2.2. Alternative 2 – Provide 161-kV Delivery Point

TVA would tap the Columbus-DeKalb 161-kV Transmission Line utilizing a new tap structure to be installed in the Columbus-DeKalb 161-kV Transmission Line at the connection point shown on Figure 1-1. TVA would construct approximately 8 miles of 161-kV tap line from the tap structure to the new Paulette 161-kV Substation. TVA would install switches in the existing line on each side of the tap structure and provide low-side metering at the new substation. Four County EPA would construct the new substation with two, 3-phase transformers.

2.3. Alternative Eliminated From Detailed Study - Increase Capacity at South Macon 161-kV Substation

The distributor would increase capacity at the South Macon Substation by replacing the existing one 12/16/20 megavolt ampere (MVA) transformer with two 18/24/30 MVA transformers. The distributor would also convert 2.9 miles of existing single-circuit feeder to triple-circuit with heavier conductors and 7.1 miles to double circuit with heavier conductors. An additional 7.5 miles of single-circuit tie line would be built from the substation at

Shuqualak to the existing South Macon distribution just west of the community of Paulette. Four regulator banks would be installed on the South Macon feeders. TVA would provide metering. This alternative would result in a total cost to TVA and Four County EPA of about $2 million greater than that for Alternative 2. Based on cost differential and potential for similar impacts, this alternative was not identified as TVA's preferred alternative.

2.4. Description of Construction, Operation, and Maintenance of the Proposed 161-kV Transmission Line

2.4.1. Transmission Line Construction

2.4.1.1. Structures and Conductors

The proposed transmission line would primarily use single-steel poles (Figure 2-1). The poles would vary in height according to the terrain and would average between 80 to 90 feet. At creek or highway crossings, double poles may be used in order to maintain adequate clearance between the conductors and whatever lies below them (Figure 2-1).

a  b 

Figure 2-1. Single-Pole (a) and Double-Pole (b) 161-kV Transmission Structures

Three conductors (the cables that carry the electrical current) are required to make up a circuit in alternating current transmission lines. For 161-kV transmission lines, each conductor is made up of a single cable. The conductors are attached to fiberglass or ceramic insulators suspended from the structure cross arms. A smaller overhead ground wire is attached to the top of the structures. This ground wire may contain fiber optic communication cables.

Poles at angles in the line may require supporting guys. Some structures for larger angles could require two or three poles. Most poles would be directly imbedded in holes augured into the ground to a depth equal to 10 percent of the pole's length plus an additional 2 feet. The holes would normally be backfilled with the excavated material. In some cases, gravel or a cement and gravel mixture might be used. Some structures may be self-supporting (non-guyed) poles fastened to a concrete foundation that is formed and poured into an excavated hole. The switches would be installed at the tap point and placed on laced-steel

structures, placed on four concrete foundations. These structures would be about 30 to 40 feet in height above ground level.

Equipment used during the construction phase would include trucks, truck-mounted augers and drills, as well as tracked cranes and bulldozers. Low ground pressure equipment would be used in specified locations to reduce environmental impacts.

2.4.1.2. Right-of-Way Acquisition and Clearing

New right-of-way, 100 feet wide, would be needed for the transmission line. TVA would purchase easements from landowners for the new right-of-way on private land. These easements would give TVA the right to construct, operate, and maintain the transmission line, as well as remove “danger trees” off the right-of-way. Danger trees include any trees that are located off the cleared right-of-way and are tall enough to pass within 6 feet of a conductor or structure should it fall toward the transmission line. Fee title for the land within the right-of-way would normally remain with the landowner, and a number of activities could be continued on the property by the landowner. The easement would prohibit certain activities such as the construction of buildings and any other activities within the right-of-way that could interfere with the transmission line or create a hazardous situation.

Because of the need to maintain adequate clearance between tall vegetation and transmission line conductors, as well as to provide access for construction equipment, most trees and shrubs would be initially removed from the entire width of the right-of-way. Equipment used during this right-of-way clearing would include chain saws, skidders, bulldozers, and/or low ground pressure feller-bunchers. Marketable timber would be salvaged where feasible; otherwise, woody debris and other vegetation would be piled and burned, chipped, or taken off site. In some instances, vegetation may be windrowed along the edge of the right-of-way to serve as sediment barriers. Vegetation removal in streamside management zones (SMZs) and wetlands would be restricted to trees tall enough, or with the potential soon to grow tall enough, to interfere with conductors. Clearing in SMZs would be accomplished using hand-held equipment or remote-handling equipment, such as a feller-buncher, in order to limit ground disturbance. Right-of-Way Clearing Specifications, Environmental Quality Protection Specifications for Transmission Line Construction, and TVA Transmission Construction Guidelines Near Streams are included in Appendices II, III, and IV.

Subsequent to clearing and construction, the right-of-way would be restored as much as is possible to its state prior to construction. Pasture areas would be reseeded with suitable grasses. Wooded areas would be restored using native grasses and other low-growing species. Erosion controls would remain in place until the plant communities were fully established. Streamside areas would be revegetated as described in Appendices II-V.

2.4.1.3. Access Roads

Permanent access roads would be needed to allow vehicle access to each structure and other points along the right-of-way. TVA would obtain the necessary rights for these access roads from landowners. Existing roads including farm and field roads, some of which may need upgrading, would be used where possible. New access roads would be located on the right-of-way wherever possible and designed to avoid severe slope conditions and minimize stream crossings. New access roads would be about 20 feet wide and surfaced with dirt or gravel. Culverts and other drainage devices, fences, and gates would be

installed as necessary. Culverts installed in any permanent streams would be removed following construction; however, in wet-weather conveyances they would be left or removed, dependent upon the wishes of the landowner or any permit conditions that might apply. New temporary access roads would be restored to previous conditions. If graveled, the gravel would be removed and the area planted with approved seed mixtures following construction. Additional applicable right-of-way clearing and environmental quality protection specifications are listed in Appendices II and III. The locations of access roads would be closely coordinated with potentially affected landowners.

2.4.1.4. Construction Assembly Areas

One or more construction assembly areas would be required for worker assembly, vehicle parking, and material storage. These areas may be on existing substation property or leased from a private landowner for the duration of the construction period. These areas are typically 5 to 10 acres in size, relatively flat, previously cleared, and located adjacent to an existing paved road near the transmission line. Depending on site conditions, some minor grading and installation of drainage structures may be required. The areas would be graveled and fenced, and trailers used for material storage and office space would be parked on the areas. Following the completion of construction activities, all trailers, unused materials, and construction debris would be removed from the site. Removal of the fence and restoration would be at the discretion of the landowner.

2.4.1.5. Conductor and Ground Wire Installation

Reels of conductor and ground wire would be delivered to various staging areas along the right-of-way, and temporary clearance poles would be installed at road and railroad crossings to reduce interference with traffic. A small rope would be pulled from structure to structure. It would be connected to the conductor and ground wire and used to pull them down the line through pulleys suspended from the insulators. A bulldozer and specialized tensioning equipment would be used to pull conductors and ground wires to the proper tension. Crews would then clamp the wires to the insulators and remove the pulleys.

2.4.2. Operation and Maintenance

2.4.2.1. Inspection

Periodic inspections of 161-kV transmission lines are performed from the ground and by aerial surveillance using a helicopter. These inspections, which occur on approximately 5-year cycles after operation begins, are conducted to locate damaged conductors, insulators, or structures, and to report any abnormal conditions that could hamper the normal operation of the transmission line or adversely impact the surrounding area. During these inspections, the condition of vegetation within the right-of-way, as well as immediately adjoining the right-of-way, is noted. These observations are then used to plan corrective maintenance or routine vegetation management.

2.4.2.2. Vegetation Management

Management of vegetation along the right-of-way would be necessary to ensure access to structures and to maintain an adequate distance between transmission line conductors and

vegetation. For 161-kV transmission lines, National Electric Safety Code standards require a minimum clearance of 24 feet.

Management of vegetation along the right-of-way would consist of two different activities: felling of danger trees adjacent to the cleared right-of-way and control of vegetation with the cleared right-of-way.

Management of vegetation within the cleared right-of-way would use an integrated vegetation management approach designed to encourage the low-growing plant species and discourage tall-growing plant species. A vegetation-reclearing plan would be developed for each transmission line segment based on the results of the periodic inspections described above. The two principal management techniques are mechanical mowing, using tractor-mounted rotary mowers, and herbicide application. Herbicides are applied normally in areas where heavy growth of woody vegetation is occurring on the right-of-way and mechanical mowing is not practical. Herbicides would be selectively applied from the ground with backpack sprayers or vehicle-mounted sprayers. Given the land use in the area of this project, right-of-way maintenance is expected to be minimal.

Any herbicides used would be applied in accordance with applicable state and Federal laws and regulations and the commitments listed in this document. Only herbicides registered with the United States Environmental Protection Agency (USEPA) would be used. Appendix V contains a list of the herbicides and adjuvants (ingredients added to the herbicide solution to increase its effectiveness) currently used by TVA in right-of-way management. This list may change over time as new herbicides are developed or new information on presently approved herbicides becomes available.

Other than vegetation management, little other maintenance work would normally be required. The transmission line structures and other components typically last several decades. In the event that a structure must be replaced, the structure would normally be lifted out of the ground by crane-like equipment and the replacement structure inserted into the same hole or an immediately adjacent hole. Access to the structures would be on existing roads where possible. Replacement of structures may require releveling the area surrounding replaced structures, but there would be little, if any, additional disturbance compared to the initial installation of the structure.

2.5. Project and Siting Alternatives

The process of siting this transmission line followed the basic steps used by TVA to identify acceptable transmission line routes:

- Determine potential existing power sources to supply the substation.
- Define the study area.
- Collect data to minimize potential impacts to cultural and natural features.
- Develop general route options and potential routes.
- Delimit one or more alternative transmission line routes within the option(s).
- Gather public input.
- Incorporate public input into the final identification of the preferred transmission line route.

2.5.1. Definition of Study Area

The first task in defining the study area was to identify the power sources that could supply the identified need. The nearest source identified was TVA's Columbus-DeKalb 161-kV Transmission Line.

The study area is bounded by the Columbus-DeKalb 161-kV Transmission Line on the west, State Route (SR) 14 on the north, Paulette Road on the east, and to the south, the section line running east-west from South Macon Substation (Figure 1-2). The study area is entirely within Noxubee County and southeast of Macon, encompassing approximately 18 square miles or 11,520 acres.

A geographic information system (GIS) based routing map and color orthophotography were developed. The GIS data generated a "constraint" model that served to guide the routing process by identifying obvious routing conflicts or sensitive areas including, but not limited to, houses, rivers, historical sites, and wetlands (Figure 1-2). Following is a brief description of other aspects of the study area:

- *Natural and Cultural Features*: The study area was primarily a flat to rolling lowland area used for agriculture. In areas closer to Macon, this land use profile gives way to private residences located along county roads. This characteristic produced the first consideration for transmission line routing. Most of the route alternatives shared a segment near Macon, since these alternatives avoided residential areas to the north or south of town. A second consideration was the large, low, often flooded area near the southwest corner of the study area. The Noxubee River follows a winding path from north to south, and the area east of the South Macon Substation is a large floodplain. In addition, it is heavily forested and in some areas has year-round standing water.

- *Land use*: A noticeable change in land use occurs as you move from west to east and cross Elon Road. At that road crossing, most of the residential use gives way to agriculture or pasture with sections of wooded land. Many property lines are wooded, and some of the old growth trees are likely used as survey markers.

- *Transportation*: Major transportation routes in the study area include SR 14 (from Macon to Paulette Road), Paulette Road, and SR 45.

2.5.2. Collect Data

Geographic data, such as topography, land use, transportation, environmental features, cultural resources, near-term future development, and land conservation information were collected for the entire study area. Analysis of the data was aided by using GIS. This system allowed the multitude of factors of the large study area to be examined simultaneously to develop and evaluate numerous options and scenarios to identify the route or routes that would best meet project objectives.

Maps were created to show regional opportunities and constraints clearly. Sources included 1 inch = 500 feet aerial photography, county tax maps/property boundaries, United States Geological Survey (USGS) digital line graphs, Digital Elevation Models, National Wetland Inventory, and cultural resource data, among others. Aerial photography was interpreted to obtain land use and land cover data, such as forests, agriculture, wetlands, houses, barns, commercial and industrial buildings, churches, and cemeteries. Data were

analyzed both manually and with GIS. Manual calculations from aerial photographs, tax maps, and other sources included the number of road crossings, stream crossings, and property parcels.

The siting team used GIS to analyze multiple factors when defining and comparing alternative routes. GIS displays and analyzes multiple layers of information simultaneously using geographically referenced digital information.

For this project, GIS data analysis included steep slope crossings, land cover, land use, and other data. A 1:100,000 GIS database was developed and used for regional opportunity and constraint analysis, while a 1:24,000 database was developed for more complex computations, such as acreage of wetlands and percent slope.

2.5.3. Develop General Route Options and Potential Routes

From the information gathered during the systems' studies and data development phases, five transmission line route options were identified to connect the identified power sources to the new Four County EPA Substation near Paulette Road (Figure 1-2). The tap connection utilized on Route 4, rather than taking the route all the way to the South Macon Substation, was identified as being a more direct electrical connection and also shortened that alternative by more than a mile.

Route 1 would begin at the South Macon Substation and head due east along the section line (T14N R17E section 15); it would cross the Noxubee River and then turn northeast maintaining a buffer along Plum Creek until crossing Plum Creek near Elon Road. The route would then follow the section 13 north boundary until approaching Tibby Creek, where it would turn once again northeast and proceed to the northern boundary of section 8, turning and following the section east to Paulette Road.

Route 2 would begin similarly to Route 1; however, near section 13, the route would turn northeast and follow an underground pipeline before joining the route identified as Route 3. The route would then run along T14N R18E section 7 and continue along that line until intersecting Paulette Road.

Route 3 would begin at the South Macon Substation and head northeast parallel to SR 45 until reaching the northern side of a residential area on the south side of Macon, Mississippi. The route would then turn due east and after crossing Elon Road, turn south, paralleling the road until reaching the northern boundary of T14 R18E section 11. At this section line, the route would turn due east and follow this section until reaching Paulette Road and terminating at Paulette Substation.

Route 4 would begin at a tap point located in the Columbus-DeKalb Transmission Line near existing structure 366 located approximately a mile south of Macon, Mississippi, on the east side of SR 145 (Old SR 45). The route would then leave the tap point and continue due east crossing SR 45. The route would then rejoin the same route taken by Route 3 crossing Elon Road, following the outside of a buffer along Plum Creek and intersecting the Mississippi section line T14 R18E section 11 north boundary and proceed due east until crossing Paulette Road and terminating at the Paulette Substation.

Route 5 would begin at the South Macon Substation and follow the proposed Route 1 until reaching the area near Zion Hill Cemetery. The route would then turn to the southeast and

follow an existing unnamed gravel road until reaching Tibby Creek. After crossing the creek floodplain, the route would turn northeast and continue on to the new Paulette Substation.

2.5.4. Establish and Apply Siting Criteria

TVA has long employed a set of evaluation criteria that represents opportunities and constraints for development of transmission routes. The criteria are oriented toward factors such as existing land use, ownership patterns, environmental features, cultural resources, and visual quality. Cost is also an important factor, with engineering considerations and right-of-way acquisition cost being the most important elements. Information gathered and comments made at the public meeting and subsequent comment period were taken into account while refining criteria to be specific to the study area.

Each of the routes was evaluated according to these criteria relating to engineering, environmental, land use, and cultural concerns. Specific criteria are described below; for each category described, a higher score means a bigger constraint. For example, a greater number of streams crossed, a longer route length, or a greater number of historic resources affected would give an alternative route a worse score.

- *Engineering Criteria*: total length of the transmission route, length of new right-of-way and rebuilt right-of-way, primary and secondary road crossings, pipeline and transmission line crossings, and total line cost

- *Environmental Criteria*: slopes greater than 30 percent (steeper slopes mean more potential for erosion and potential water quality impacts), slopes between 20 and 30 percent, visual aesthetics, forested acres, open water crossings, sensitive stream (those supporting endangered or threatened species) crossings, perennial and intermittent stream crossings, wetlands, rare species habitat, natural area crossings, and wildlife management areas

- *Land Use Criteria*: the number of fragmented property parcels, schools, houses, commercial or industrial buildings, barns, and parkland crossings

- *Cultural Criteria*: archaeological and historic sites, churches, and cemeteries

Scores for each of the alternatives were calculated by adding individual criterion values for each route. The resulting sum values were evaluated using standard statistical techniques and were assigned a ranking from 1 to 4 for each route in each subcategory (engineering, environmental, land use, and cultural).

A weighted score was produced for each route in each subcategory. This made it possible to understand which routes would have the lowest and highest impacts on engineering, environmental, land use, and cultural resources. Finally, to determine total impacts, the scores from each category were combined for an overall score.

2.5.5. Route Evaluation and Selection

Following the public open house and subsequent comment period, each route was evaluated using the updated constraint model along with the modified routing criteria obtained during the public involvement.

Routes 1 and 2 scored poorly in the preliminary studies and were even less attractive as more data were gathered. These routes traversed a very low and wide floodplain along the Noxubee River with potential construction problems due to high water and wetland concerns. Further fieldwork indicated that both routes would cross nearly 40 acres of forested wetlands areas along the Noxubee River. This, in addition to property owner comments regarding land use, made these routes look less desirable for further study.

Route 3 was the initial TVA preferred route following the preliminary study. However, during the public input process and during subsequent engineering design review, it did not fare as well. Although Routes 3 and 4 are similar, Route 3 would be nearly a mile longer, which reduced its overall scoring.

As stated, Route 4, the northernmost route, would be very similar to Route 3 and would avoid almost a mile of floodplain along SR 45 by minimizing the crossing of these wet areas. This route instead would utilize a tap arrangement nearly a mile north of the original connection location at South Macon Substation pull-off.

Route 5 was an alternate connection path to the Paulette Substation, which would have been considered only if Route 1 or 2 were selected as a preferred route. Given the lower ranking of Routes 1 and 2, Route 5 was eliminated from consideration when Routes 1 and 2 were eliminated.

Overall scoring for Route 4 showed it as the best Alternative 2 route option for minimizing impacts. Public participation showed the most support for this option, and most owners considered any southern route impractical if not impossible to build. In addition, Route 4 is the shortest route, and thus would have the smallest project “footprint” and, lowest land use impacts.

The final Alternative 2 proposed route for construction of the Columbus-DeKalb Tap to Paulette, Mississippi, Substation is shown on Figure 1.1. The route is 7.8 miles in length, affects approximately 83 acres, and represents the TVA preferred route for this project.

2.6. Identification of the Preferred Alternative

Alternative 2: Provide 161-kV Delivery Point along Route 4 is TVA’s preferred alternative.

2.7. Summary of TVA Commitments and Proposed Mitigation Measures

The following routine measures identified in this Environmental Assessment would be applied during construction and operation of the proposed transmission line:

- Best Management Practices as described in Muncy (1999).
- Environmental quality protection specifications as described in Appendices II-V.

Page intentionally blank

CHAPTER 3

3. AFFECTED ENVIRONMENT

3.1. Introduction

Chapter 3: Affected Environment succinctly describes the existing condition of the environmental resources and factors of the Noxubee County, Mississippi, area that would affect or that would be affected by implementing either Alternative 1 or Alternative 2.

3.2. Alternative 1 –Do Not Build Additional Transmission Line (No Action)

The description of the existing environment in Chapter 3, the description of the activities of Alternative 1: Do Not Build Additional Transmission Line (No Action) in Chapter 2, and the predicted effects of Alternative 1 in Chapter 4 combine to establish the baseline conditions against which the decision maker and the public may compare the potential effects of Alternative 2: Provide 161-kV Delivery Point.

3.3. Alternative 2 – Provide 161-kV Delivery Point

3.3.1. Terrestrial Ecology

3.3.1.1. Terrestrial Plants

The proposed project area lies within the East Gulf Coastal Plain Section of the Coastal Plain Physiographic Province (Fenneman, 1938). In central Mississippi, this is an area of fairly uniform topography ranging from 100 to 200 feet in elevation above sea level. Botanically, the project area occurs in the Gulf Slope Section of the Blackland Prairie Region (Braun, 1950). In Mississippi, this portion of the Blackland Prairie Region extends across the belted Coastal Plain, in which topography, soils, and thus vegetational features are arranged in distinctive, southeast-northwest-trending parallel bands. Native forests of this region are characterized by mixtures of eastern red cedar, pines, oaks, and hickories. Although the historic forests were likely to have been dominated by hardwood and eastern red cedar, loblolly pine has come to characterize second-growth stands. Despite the occurrence of these forests, many areas are still dominated by grasses, particularly along hilltops.

Plant communities in the proposed project area can be grouped into six broad categories: grasslands (pasture and rights-of-way), seedling/sapling vegetation, pine-dominated forests, cropland, riparian-hardwood forests, and eastern red cedar-osage-orange forests (Table 3-1). Numerous common and representative plant species were identified along with species encountered most frequently within each plant community type (Appendix VI).

Table 3-1. List of Plant Communities Observed on the Proposed Route and the Estimated Percent Coverage Occupied by Each

Plant Community	Percent Coverage
Grasslands	42
Pine-Dominated Forests	15
Older Seedlings/Saplings (>10 years)	12
Cropland	11
Riparian-Hardwood Forests	11
Young Seedlings/Saplings (<10 years)	6
Eastern Red Cedar-Osage-Orange Forests	3

> = Greater than
< = Less than

Grasslands, dominated by grasses and periodically mowed, are the most common plant community in the proposed project area. Pastures are most prevalent, although rights-of-way for roadsides and transmission lines are included. Most of these areas are heavily dominated by tall fescue. Additional grass species present include Bahia grass, Bermuda grass, Johnson grass, and West Indian drop seed. Several species of forbs also occur within this vegetation type including Canada horseweed, Chinese bush clover, and field garlic. In more calcareous areas, dominant species include diamondflowers, green-flowered milkweed, Macartney rose, Maryland goldenaster, pinnate prairie coneflower, stiff goldenrod, Tennessee aster, and yellow Indiangrass.

Pine-dominated forests consist of mostly pine plantations, although some areas are natural stands. These forests are heavily dominated by loblolly pine (over 90 percent). Hardwood and herbaceous species found in other communities along the proposed project route are also present in these forests.

Seedling/Sapling vegetation with 80 to 100 percent of the tree cover removed is characteristic of areas that were either previously clear-cut or heavily thinned. Tree species in this community are similar to those found in pine-dominated forests and riparian-hardwood forests. Other representative species include broom-sedge, Canada goldenrod, Chinese privet, late-flowering thoroughwort, Japanese honeysuckle, Johnson grass, southern dewberry, sugar cane plumegrass, and trumpetcreeper. Tree species within 10- to 15-year-old clear-cut areas include those of the riparian-hardwood forest vegetation type.

Cropland consists of mainly grain sorghum with some soybeans. Common weed species in these crops include annual bluegrass, Carolina geranium, henbit, and sticky chickweed.

Riparian-hardwood forests occur in bottomlands along the creeks and rivers and are typically limited to narrow strips that contain at least 90 percent hardwoods in the canopy. Characteristic trees in this forest type include cherry bark oak, eastern cottonwood, green ash, overcup oak, southern shagbark hickory, sugarberry, swamp chestnut oak, sweet gum, sweet pignut hickory, and willow oak. Characteristic understory trees and shrubs include Chinese privet, deciduous holly, eastern redbud, and rough-leaf dogwood. Common understory vines in these forests include common greenbriar, peppervine, poison ivy, and trumpetcreeper. Herbaceous species are limited in these areas.

Eastern red cedar-osage orange forests occupy a small portion of the proposed transmission line route and occur on shallow soils, either in creek valleys or on slopes. Although dominated by eastern red cedar and osage-orange, chinkapin oak and Durand's white oak were common in these forests. Common understory woody species include Alabama supplejack, Chickasaw plum, coralberry, and rusty blackhaw. All of the threatened and endangered plant species encountered adjacent to the proposed transmission line route (see Section 3.3.2.1) occurred within this community type.

The plant communities observed along the proposed project route are common and representative of the region. No uncommon plant communities were observed on the proposed project route.

Over 85 percent of the lands along the proposed route have been subjected to some level of disturbance from agricultural use. As a result, several invasive plant species are present including Bermuda grass, privet, Japanese honeysuckle, and cogongrass. The remaining lands are a mixture of eastern red cedar-osage-orange and riparian-hardwood forests that have also been subjected to various levels of disturbance and contain, to a lesser degree, the same invasive terrestrial plant species.

3.3.1.2. Terrestrial Animals

The plant communities along the proposed route are dominated by a variety of early successional and agriculturally modified habitats and are used by a variety of locally and regionally common species of wildlife. Common mammals and birds along the route include white-tailed deer, eastern cottontail rabbit, raccoon, coyote, wild turkey, American goldfinch, mourning dove, and eastern meadowlark. Breeding populations of spring peepers, upland chorus frogs, and southern cricket frogs were heard at various locations along the proposed transmission line route.

Most of the forested habitats along the proposed route are restricted to riparian areas associated with the Noxubee River and Plum Creek. These habitats are used by a variety of wildlife species including nine-banded armadillo, opossum, stripped skunk, gray squirrel, and white-tailed deer. Common birds include great blue heron, wood duck, barred owl, eastern towhee, and red-winged blackbird. Common amphibians and reptiles normally found in these habitats include spring peeper, southern cricket frog, leopard frog, and mud and musk turtles.

3.3.2. Threatened and Endangered Species

3.3.2.1. Plants

The TVA Natural Heritage database indicated that no federally listed and 44 state-listed plant species are known from Noxubee County, Mississippi (Table 3-2). These species as well as federally and/or other state-listed species not presently known from this county were sought within areas that would be impacted by the proposed project.

Table 3-2. Rare and Uncommon Species of Plants Reported From Noxubee County, Mississippi

Common Name	Scientific Name	Status[1]		State
		Federal	State	Rank
Allegheny-spurge	*Pachysandra procumbens*	--	NOST	S3
American bladdernut	*Staphylea trifolia*	--	NOST	S3
American columbo	*Frasera caroliniensis*	--	NOST	S2S3
American ginseng	*Panax quinquefolius*	--	NOST	S3
Asa gray sedge	*Carex grayi*	--	NOST	S4
Barrens silky aster	*Aster pratensis*	--	NOST	S1
Big shellbark hickory	*Carya laciniosa*	--	NOST	S2S3
Blue ash	*Fraxinus quadrangulata*	--	NOST	S2
Blue waxweed	*Cuphea viscosissima*	--	NOST	S1?
Burning bush	*Euonymus atropurpureus*	--	NOST	S2S3
Canada wild-ginger	*Asarum canadense*	--	NOST	S2S3
Clustered poppy-mallow	*Callirhoe triangulata*	--	NOST	S1S2
Drummond pennyroyal	*Hedeoma drummondii*	--	NOST	S1
Eastern purple coneflower	*Echinacea purpurea*	--	NOST	S3S4
Gallion hawthorn	*Crataegus meridionalis*	--	NOST	S1
Green violet	*Hybanthus concolor*	--	NOST	S2
Grooved yellow flax	*Linum sulcatum*	--	NOST	S3S4
Lobed tickseed	*Coreopsis auriculata*	--	NOST	S2S3
Mead's sedge	*Carex meadii*	--	NOST	S3S4
Narrow flowered beard-tongue	*Penstemon tenuiflorus*	--	NOST	S2S3
Narrow-leaf fever root	*Triosteum angustifolium*	--	NOST	S3
Odorless mock-orange	*Philadelphus inodorus*	--	NOST	S2
Pitcher's stitchwort	*Minuartia patula*	--	NOST	S3S4
Prairie iris	*Nemastylis geminiflora*	--	NOST	S2
Purple fringeless orchid	*Platanthera peramoena*	--	NOST	S2S3
Rattle-vetch	*Astragalus canadensis*	--	NOST	S2
Rough rattlesnake-root	*Prenanthes aspera*	--	NOST	S2
Shiner's false-foxglove	*Agalinis pseudaphylla*	--	NOST	S2
Slender sedge	*Carex gracilescens*	--	NOST	S2S3
Small-flower scorpionweed	*Phacelia dubia*	--	NOST	S2S3
Small-toothed sedge	*Carex microdonta*	--	NOST	S2?
Southern meadowrue	*Thalictrum debile*	--	NOST	S1S2
Spreading bladder-pod	*Lesquerella gracilis*	--	NOST	S2
Spreading rockcress	*Arabis patens*	--	NOST	S1
Swamp hickory	*Carya leiodermis*	--	NOST	S2S3
Three-flowered hawthorn	*Crataegus triflora*	--	NOST	S1
Turk's-cap Lily	*Lilium superbum*	--	NOST	S3S4
Upland swamp privet	*Forestiera ligustrina*	--	NOST	S1
White dogtooth-violet	*Erythronium albidum*	--	NOST	S2
Wild hyacinth	*Camassia scilloides*	--	NOST	S2S3
Woodland muhly	*Muhlenbergia sylvatica*	--	NOST	SU
Yellow parilla	*Menispermum canadense*	--	NOST	S3S4
Yellow pimpernell	*Taenidia integerrima*	--	NOST	S1
Yellowwood	*Cladrastis kentukea*	--	NOST	S2

[1] Status code: NOST = No state status assigned
Note: See text for explanation of state rank

Plant species listed by the state of Mississippi are not assigned an official state status, such as endangered or threatened. Instead, the Mississippi Natural Heritage Program uses the heritage-ranking system developed by The Nature Conservancy to indicate the relative rarity of state-listed species. Within this system, S1 indicates that a species has very few populations in the state; S5 indicates that the species is abundant and secure in the state; and S2, S3, and S4 indicate intermediate degrees of rarity. SU indicates possible imperilment of a species, but the rank is uncertain at this time due to lack of information.

3.3.2.2. Terrestrial Animals

One federally listed and four state-listed species of terrestrial animals are reported from Noxubee County, Mississippi (Table 3-3). Two species are reported from locations within 3 miles of the project site, in the Noxubee River.

Table 3-3. Rare and Uncommon Species of Terrestrial Animals Reported From Noxubee County, Mississippi

Common Name	Scientific Name	Status[1]	
		Federal	State
Red-cockaded woodpecker	*Picoides borealis*	END	END
Alligator snapping turtle	*Macroclemys temminckii*	--	NOST
Black-knobbed map turtle *	*Graptemys nigrinoda*	--	END
Mississippi map turtle *	*Graptemys kohnii*	--	NOST
Southern coal skink	*Eumeces anthracinus pluvialis*	--	NOST

[1] Status codes: NOST = No state status assigned; END = Endangered
* = Known from localities within 3 miles of the project site

The red-cockaded woodpecker is known from several sites in the Noxubee National Wildlife Refuge (NNWR). This species forms nesting colonies in mature pine stands having little mid-story vegetation.

Black-knobbed map, Mississippi map, and alligator snapping turtles are usually found in large rivers and lakes. These species are reported from the NNWR, Noxubee River, and Tennessee-Tombigbee Waterway.

Southern coal skink is reported from a site within the NNWR. This species is often found under root masses along streams or among detritus near moist areas.

Although there are no current breeding records of bald eagles (*Haliaeetus leucocephalus* – federally threatened), wood storks (*Mycteria americana* – federally endangered) or osprey (*Pandion haliaetus* – NOST*) near the project site, these species potentially could occur in habitats associated with the Noxubee River and the Tennessee-Tombigbee Waterway. Wood storks could forage in the numerous aquaculture impoundments in the vicinity. In addition, crawfish frogs (*Rana areolata circulosa* – NOST) could occur in suitable habitats in the bottomland hardwood forests along the Noxubee River.

3.3.2.3. Aquatic Animals

The TVA Natural Heritage database and information from the Mississippi Natural Heritage Program indicated the freckled darter (*Percina lenticula* - NOST) occurs in the main channel of the Noxubee River and larger tributaries in the vicinity of the proposed transmission line.

The freckled darter is not assigned an official state status (such as Threatened or Endangered) by the state of Mississippi. No federally listed species are known to occur in the project area.

3.3.3. Wetlands

Activities in wetlands can be regulated under Sections 404 and 401 of the Federal Clean Water Act. Executive Order 11990 (Protection of Wetlands) also applies to some Federal activities. To conduct activities in "jurisdictional" wetlands, a nationwide general permit or an individual permit from the USACE is required. EO 11990 requires all Federal agencies to provide leadership and to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. It also requires agencies to consider factors relevant to a proposal's effect on the survival and quality of the wetlands. Among these factors considered are the maintenance of natural systems, conservation, and long-term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber resources, as well as other uses of the wetlands.

Wetland determinations were performed in the proposed project area according to USACE standards (Environmental Laboratory, 1987), which require documentation of hydrophytic vegetation (Reed, 1997), hydric soil, and wetland hydrology. Wetlands are classified according to the Cowardin system for the classification of wetlands and deepwater habitats (Cowardin, et al., 1979).

Approximately 10 acres were identified in the proposed right-of-way that met USACE parameters for wetlands that may be Federal jurisdictional wetlands under the Clean Water Act. Wetland determination data forms are provided in Appendix VII. Of these wetlands identified within the right-of way, nine are forested wetlands of approximately 4.1 acres, eight are scrub-shrub wetlands of approximately 5.9 acres, and one is an emergent (wet meadow) wetland of approximately 0.1 acre. A summary of wetland type, location, and acreage is presented in Table 3-4.

The functions performed by the project area wetlands include attenuation of flood flows, nutrient cycling, contaminant removal and transformation, sediment retention, wildlife habitat, and maintenance of biological and landscape diversity. The ecological, societal, and economic values provided by these functions include sustaining wildlife and fish resources, flood control, water quality improvement and maintenance, preservation of biodiversity, and ecosystem support (via nutrient cycling, biomass production, and nutrient export).

Table 3-4. Wetlands in the Project Area

Wetland ID	Wetland Classification[1]	Boundary Locations (west – east)	Approximate area (ft^2) of wetland in Right-of-Way length (foot) x width (foot)	Area in Right-of-Way (acres)
W1	PSS1	245+35 – 253+35	721'(100) = 72,100 28' (65') = 1,820 72,100 + 1,820 = 73,920	1.70
W2A	PSS1	232+00 – 233+00	100' (60') = 6,000	0.14
W2	PFO1	228+79 – 232+00	192' (40') = 7,680 130' (80') = 10,400 7,680 + 10,400 = 18,080	0.42
W3A	PFO1	185+70 – 188+51	281' (100') = 28,100	0.65
W3B	PSS1	189+85 – 190+32	47'(100) = 4,700	0.11
W3C	PSS1	192+76 – 193+54	78'(100) = 7,800	0.18
W3D	PSS1	194+04 – 195+83	179'(100) = 17,900	0.41
W4	PSS1	102+14 – 116+00	786' (100) = 78,600 600' (70) = 42,000 78,600 + 42,000 = 120,600	2.80
W5	PFO1	120+40.2 – 120+90	50' (10') = 500	0.01
W6	PFO1	1+39 – 7+06	567'(100') = 56,700	1.30
W7	PFO1	44+75 – 46+95	220'(100') = 22,000	0.50
W8	PSS1	56+23 – 56+97	77'(100') = 7,700	0.18
W9	PSS1	60+34 – 62+18	184'(100') = 18,400	0.42
W10	PFO1	8+71 – 9+31	60'(100') = 6,000	0.12
W11	PFO1	11+42 – 15+23	381'(100') = 38,100	0.87
W12	PFO1	19+96.9 – 20+32.9	36'(100') = 3,600	0.08
W14	PEM1	148+00 – 148+66	66'(65') = 4,290	0.10
W15	PFO1	116+23 – 117+30	107'(70') = 7,490	0.17

ID = Identification
ft^2 = Square foot
' = Feet
[1] Classification codes: PSS = Palustrine scrub-shrub; PFO = Palustrine forested; PEM = Palustrine emergent

The emergent and scrub-shrub wetlands that are likely to replace the forested wetlands following tree clearing would continue to perform valuable functions including flood control, removal and transformation of contaminants, sediment retention, wildlife habitat, species diversity, and ecosystem support functions. However, where forested wetlands are cleared and maintained in low-growing vegetation (emergent and/or scrub-shrub) there is a loss or reduction of functions provided only by forested wetlands. These functions include:

- Enhanced levels of primary production, nutrient cycling, and carbon storage and export due to greater biomass of forested wetlands.
- Essential habitat and woody structure required by species that are dependent on forested habitats for all or part of their life cycle (woodland amphibians, bats, and some species of wintering, migratory, and nesting birds), including microhabitats such as shaded vernal ponds, stumps, and snags.
- Shading and cooling effects on vernal ponds, floodwaters passing through the floodplain, and adjacent streams.

National Wetland Inventory data, aerial photographs (USGS, 2003), and Mississippi's statewide GIS (Automated Resource Information Center, 2003) indicated approximately 285 acres of forested wetlands and 51 acres of emergent wetlands occur within the 524-acre portion of the Noxubee River floodplain in the project vicinity between the SR 45 Bypass and Old SR 45. The emergent wetlands are assumed to exist in previously cleared forested wetland areas because the normal vegetative cover of undisturbed sites in floodplains in this region is forest. This suggests a 15 percent reduction in forested wetland areas between the two roads. The proposed right-of-way would cross through the middle of the forested floodplain near the midway point between the two roads, causing further fragmentation of the forested wetlands.

Impacts to forested wetlands are of concern due to the historic high rate of loss and continuing losses of this type of wetland and the long time period necessary to replace forested wetlands and their functions. The forested wetland category is one of the most difficult to restore or replace functionally. The timetable for creating or regenerating mature forested wetlands and their associated functions can take 80–100 years.

Forested wetlands have experienced the greatest decline of any single category of wetlands, both in the southeastern United States (Hefner, et al., 1994) and the United States as a whole (United States Fish and Wildlife Service, 2001). Although the annual rate of loss has declined since the mid-1970s to mid-1980s, due in part to Federal Government agriculture programs such as Swampbuster and Conservation Reserve Program, forested wetland acreage continues to decline with an estimated 4 million acres of forested wetlands lost or converted between 1986 and 1997 (Dahl, 2000). Part of the decline in forested wetland acreage was due to their conversion to other vegetation types, such as ponds and emergent and scrub-shrub wetlands. The largest contributors to loss and conversion of forested wetlands have been agriculture, silviculture (including conversion to pine plantations), and urban and rural development.

Within the Noxubee River watershed, forested wetlands occur in the Noxubee River floodplain (W6, W10, W11, W12), and in the Tibby Creek (W2), Plum Creek (W5, W15), and unnamed tributary (W7, W3A) drainages (Table 3-4). These forests range from young to mid-age stands in tributary locations to mature stands in the Noxubee River floodplain. The scrub-shrub wetlands are located in the Tibby Creek (W1, W2A), Plum Creek (W3B, W3C, W3D, W4), and unnamed tributary (W8, W9) drainages. The scrub-shrub wetlands are on former agricultural or cleared lands (W1, W4), disturbed lands (W2A), and in forest clear-cuts (W3B, W3C, W3D, W8, W9). The emergent (wet meadow) wetland (W14) is in an upland location in a cleared, previously disturbed area at the junction of two forestry/farm roads at a woods/hayfield edge. The forested and scrub-shrub wetlands receive primary water inputs from overbank flooding and seasonal high-water tables and are hydrologically connected to surface waters. The emergent wetland appeared to be hydrologically isolated and temporarily saturated as a result of direct precipitation and runoff.

3.3.4. Aquatic Ecology

The proposed 161-kV transmission line is located within the Noxubee River drainage in Noxubee County. Forty-five fish species are known from Noxubee County (Ross and Brenneman, 1991). While not all species known from Noxubee County and the Noxubee River drainage are likely to occur in streams potentially impacted by transmission line construction, many of them could occur in areas with suitable habitat present.

A field survey of the proposed transmission line conducted in March 2003 identified 33 perennial, intermittent, and wet-weather conveyance watercourses. Some of these crossings would involve more than one channel in close proximity to each other, and in other locations, streams lie parallel to, or meander within, the proposed right-of-way. Larger streams that could be impacted by the proposed transmission line route include the Noxubee River and its tributaries Plum and Tibby Creeks. Because of heavy rains a few days prior to the field review, small streams identified as perennial in some low-lying locations could actually be intermittent streams.

3.3.5. Managed Areas

The TVA Natural Heritage database indicated that the proposed 161-kV transmission line and associated switches are not within or immediately adjacent to any Managed Areas and/or Ecologically Significant Sites. There are two such sites, however, within 3 miles of the proposed transmission line route.

Plum Creek Bluff is a north-south oriented calcareous bluff overlooking Plum Creek about 2500 feet north of where the proposed transmission line crosses the creek. The 20-acre corridor has a deciduous forest cover that includes chinkapin oak, shumard oak, post oak, northern red oak, short leaf pine, loblolly pine, shellbark hickory, white ash, shagbark hickory, black walnut, cherry bark oak, and willow oak. Eight state-listed plant species have been recorded at the site by the Mississippi State Natural Heritage Program. The owner, a private individual, has voluntarily protected the site at the request of several professors from Mississippi State University who use the site as an outdoor teaching laboratory. The plant species of concern at the site may occur somewhat south of the site boundary (R. Wieland, Mississippi Natural Heritage Program, personal communication, January 2003).

Martins Bluff Potential National Natural Landmark centers on a calcareous bluff with a high number of vascular plant species located on Tibby Creek between the transmission line route and SR 14. This privately owned tract also represents the southernmost occurrence of blue ash in the United States. The designated boundaries incorporate a much larger area than the bluff, beginning north of SR 14 and following Tibby Creek to an area approximately a mile south of the proposed route. Lands where the route crosses Tibby Creek are in pasture. The National Natural Landmark Program was established in the 1970s by the United States National Park Service (USNPS) to identify nationally significant examples of ecologically pristine or near pristine landscapes. This tract, while meeting the criteria for listing, has not to date been registered as a National Natural Landmark.

The proposed transmission line route crosses the Noxubee River and a cut-off portion of the river channel that is hydrologically tied to the main channel. The Noxubee River is listed on the National Rivers Inventory. The river's Outstanding Values, as categorized by the USNPS, are scenery, recreation, fish and wildlife habitat, and historic and cultural qualities.

3.3.6. Recreation

There are no developed public recreation facilities in the vicinity of the proposed action. Any recreation activities are informal and dispersed and primarily consist of hunting or wildlife observation on private land or fishing on the Noxubee River.

3.3.7. Floodplains

The proposed transmission line right-of-way crosses the identified floodplains of the Noxubee River, Plum Creek, and Tibby Creek and several minor floodplain areas in Noxubee County, Mississippi. The Paulette Substation is located outside the limits of the 100-year floodplain.

3.3.8. Groundwater

The project area is underlain by the Mississippi embayment aquifer system. Specifically, the project area is underlain by a geological confining unit termed the Selma Group, which is composed of a thick sequence of clay and marl. The Selma Group confines and hydrologically separates the underlying Black Warrior River aquifer from project activities. Consequently, there is no significant aquifer in close proximity to the project area.

3.3.9. Surface Water

Precipitation in the project area averages about 59 inches per year with the wettest month in March at 6.3 inches and the driest month in October at 3.3 inches. The average annual air temperature is 62^{o}F, ranging from a monthly average of 41^{o}F in January to 79^{o}F in July. Stream flow varies with rainfall and averages about 19 inches of runoff per year. The average annual flow of the Noxubee River near Geiger, Mississippi, is 1562 cubic feet per second (cfs) or 1.42 cfs per square mile of drainage area.

The project area drains to the Noxubee River and its tributaries Woodward Creek, Jordan Creek, Tibby Creek, and Plum Creek. All streams are classified by the Mississippi Department of Environmental Quality for fish and wildlife. None of the streams are on the state 303 (d) list of impaired waters. The Noxubee River has been evaluated for pesticides, nutrients, siltation, organic enrichment-low dissolved oxygen, and pathogens. Plum Creek has been evaluated for pesticides, nutrients, siltation, and organic enrichment-low dissolved oxygen.

3.3.10. Visual

The physical, biological, and cultural features of an area combine to make the visual landscape character both identifiable and unique. Scenic integrity indicates the degree of unity or wholeness of the visual character. Scenic attractiveness is classified based on the evaluation of outstanding or unique natural features, scenic variety, seasonal change, and strategic location. Views of a landscape are described in terms of what is seen in foreground, middleground, and background distances. In the foreground, an area within 0.5 mile of the observer, details of objects are easily distinguished in the landscape. In the middleground, normally between 0.5 mile and 4 miles from the observer, objects may be distinguishable, but their details are weak and they tend to merge into larger patterns. Details and colors of objects in the background, the distant part of the landscape, are not normally discernible unless they are especially large and standing alone. The impressions of an area's landscape character can have a significant influence on how it is appreciated, protected, and used.

The proposed transmission line route would begin just south of the town of Macon. From this point of beginning, the proposed route would stretch through the countryside some 9 miles to the east, terminating near the small settlement of McLeod. Visual resources along the proposed route have been evaluated in this manner, from the point of connection near

Macon, to the terminus near McLeod. Along the proposed route in its entirety, the scenic attractiveness is common, and the scenic integrity is moderate to low.

The proposed tap would begin at the existing Columbus-DeKalb 161-kV Transmission Line, located less than a mile from the southern city limits of the town of Macon. This connection is immediately adjacent to SR 145, which once served as the primary north/south roadway. The existing transmission line and associated structures paralleling SR 145 are located largely in the lowland and floodplain areas of the Noxubee River where the topography is relatively flat and mature hardwoods and pine species can be seen in the immediate foreground up to 0.5 mile from the observer.

From this point and toward the northeast, the proposed transmission line route would parallel a bend in the Noxubee River for 0.5 mile before crossing a small embayment of the river. The topography continues to be flat with lush vegetation along the banks and floodplains of the river, which is noted for its outstanding scenery, recreation, wildlife, fishing, and history (Duncan, 2001). Views from the middleground (0.5 mile to 4 miles from the observer) and background (4 miles and beyond from the observer) are precluded, as mature vegetation is abundant in the lowland areas around the river.

As the proposed transmission line crosses the main channel of the Noxubee River, the route turns to the east where the topography becomes steeper, and the dense lowland vegetation gives way to a thinner covering of trees and undergrowth. As the vegetation opens to the north, views are available from across a small constructed reservoir at a light industrial facility. The views from the facility are in the middleground viewing distance. The route would move through this scattered vegetation just south of the small reservoir's embankment and continue through the more moderately sloping topography, reaching a road crossing at the intersection of Hall Road (a secondary two-lane roadway) and SR 45 (a primary four-lane roadway).

At the intersection, a light industrial facility and a small church face each other on opposing sides of SR 45. There are very few residences to the north and south of the proposed crossing, and vegetation frames views to the east as the pines thicken into the upland topography. Existing transmission lines and associated structures cross the roadway at this point and parallel the western right-of-way of the state route for many miles. Continuing east, the topography remains gently sloping to flat, as views of agricultural operations increase. The proposed route continues, reaching another roadway crossing at Elon Road. Here, the topography becomes less steep and vegetation gives way to more agricultural lands and scattered residential development to the south near the intersection of Elon Road and Allen Bend Road. A small plant nursery is located near the proposed transmission line road crossing. From this crossing point, the route would proceed along the eastern right-of-way of Elon Road. Agricultural fields, several small barns and outbuildings, and two silos that are low in height can be seen in the foreground distance. Further south on Elon Road, the vegetation becomes dense, as mature pines are visible along the right-of-way. Houses are scattered to the east, and vegetation is sparse where development exists. Existing transmission lines and associated structures are visible in the foreground as they traverse and run parallel to the west of Elon Road for approximately 0.25 mile.

From this point, the route would travel in an easterly direction, crossing land that is mostly open and currently used for agriculture. Approaching Plum Creek, the vegetation becomes increasingly dense as the topography settles into lower lying terrain. Continuing eastward to Poag Road, the route travels through a range of gently sloping topography that is spotted with stands of pine and mixed hardwoods.

At the Poag Road crossing, the vegetation is heavy on opposing sides of the road as cedars screen views of agricultural fields to the west and as a mature forest stand begins to the east. The proposed route would continue east, crossing Tibby Creek and a maintained pipeline right-of-way. The topography, land use, and vegetation remain typical to the route for approximately 3 miles before turning south for a little over 0.25 mile.

Continuing east, the proposed route would travel over expansive farmland approaching Paulette Road. Silos are visible in the middleground distance as are farming operations, spread low against a background of thin vegetation. As the proposed route crosses Paulette Road, views open to further expanses of agricultural lands, and mature vegetation in the background viewing distance loses texture and color, giving way to a broadly horizontal form against the horizon. In the immediate foreground, transmission lines are visible, stretching east of Paulette Road far into the background distance. It is at this point that the proposed transmission line would terminate into a proposed substation facility.

3.3.11. Cultural Resources

Central Mississippi has been the location of human occupation for over 12,000 years. The prehistory and history of the area is generally divided into six broad periods: Paleo Indian (10,000-8000 B.C.); Archaic (8000-1000 B.C.); Gulf Formational (1100-300 B.C.); Woodland (300 B.C.-900 A.D.); Mississippian (1000-1700 A.D.); and Historic (1700 A.D.-present). Prehistoric land use and settlement vary during each period, but generally, short- and long-term habitation sites are located on floodplains and alluvial terraces along rivers and tributaries. Specialized campsites tend to be located on older, alluvial terraces and in the uplands.

The Historic Period is represented by settlement in the region by Europeans, European Americans, and African Americans and the subsequent removal of Native American tribes. Excursions into the area by French, Spanish, and English traders and explorers occurred during the seventeenth and eighteenth centuries. Clashes between the native Choctaw and Chickasaw and Europeans continued through the eighteenth century. The Mississippi Territory was created in 1798 and was admitted into statehood in 1817. The removal of the Choctaw from the area began in the 1830s until approximately 1000 Choctaw remained in the state in 1860. Noxubee County was formed from land that was ceded by the Choctaw. Settlement in the county at first occurred around the Noxubee River, but later, the introduction of the railroad affected where settlement took place. The area is part of an agriculturally rich region with a plantation economy prior to the Civil War. Although there was little Civil War activity in the county, post-war recovery was slow. The economy continues to be dominantly agricultural with modern farms trading the traditional cotton and corn crops for soybean, wheat, and cattle. Today the timber industry is also a major portion of the economy (Price, et al., 2003).

Currently, there are 13 properties listed in the National Register of Historic Places (NRHP) in Noxubee County. None of these properties are within the proposed project's Area of Potential Effects (APE). The APE for the project was defined for archaeological resources as all areas upon which the transmission line would be located. The APE for historic structures and sites was defined as all areas from which the proposed line would be visible.

The archaeological survey identified three archaeological sites. Only one of the sites, 20NO601, was considered eligible by the Mississippi Department of Archives and History to be assigned a state site number. Site 20NO601 is a scatter of historic artifacts that was not recommended eligible for listing in the NRHP. Field Sites 1 and 3 also appeared to be

remnants of historic home sites but were not considered significant enough to warrant an official state site number (Price, et al., 2003).

The historic and architectural survey only identified one previously recorded historic structure that is recorded in state records as 103-MAC-5022. The structure on the property is an abandoned, late nineteenth-century, “piano box” style house. Although the unique architectural form of the house was noted, the integrity of the structure has been compromised making it ineligible for listing in the NRHP. The farmstead within which the structure is situated was also investigated but does not possess any significant farm structures or a connection with any important historical events or persons that would make it eligible for listing in the NRHP. Additionally, outbuildings on Elon Road were investigated but were found ineligible for the NRHP and were not assigned a state site number (Price, et al., 2003).

Page intentionally blank

CHAPTER 4

4. ENVIRONMENTAL CONSEQUENCES

4.1. Introduction

Chapter 4: Environmental Consequences presents the results of TVA's analyses of potential impacts on environmental and cultural resources. These analyses rely on information about existing conditions presented in Chapter 3: Affected Environment.

4.2. Effects of Alternative 1 - Do Not Build Additional Transmission Line (No Action)

Factors outside of TVA's control are expected to continue to influence the landscape of the region. These include reasonable foreseeable private and public activities associated with industrial and residential development and associated infrastructure. Current population trends affecting local species of wildlife and plants would likely continue. Should the proposed TVA transmission line not be built, to meet the increasing load demands, Four County EPA would have to replace existing transformers, convert 10 miles of existing circuits, and build an additional 7.5 miles of transmission line from the substation at Shuqualak to the existing South Macon distribution just west of the community of Paulette. Depending on the routes chosen by Four County EPA, the potential for impacts are likely to be similar during construction and operation as the proposed construction of the TVA 161-kV transmission line.

4.3. Effects of Alternative 2 - Provide 161-kV Delivery Point

4.3.1. Terrestrial Ecology

4.3.1.1. Terrestrial Plants

Construction and operation of the proposed transmission line would affect an area of about 83 acres. The predominant impact to vegetation would be the long-term conversion of about 34 acres of forest to early-successional habitats. The affected forest types are relatively common in the area, and no uncommon plant communities or otherwise sensitive plant habitats would be affected. Potential impacts from the spread of invasive plant species would be minimized by replanting disturbed areas with native species or noninvasive nonnative species. Impacts to the terrestrial ecology of the region are expected to be insignificant.

4.3.1.2. Terrestrial Animals

Most of the wildlife habitats along the proposed transmission line route have been modified by previous agricultural activities and are common to the region. Animal species observed along the proposed route were both locally and regionally common.

The forested wetland habitat along the Noxubee River provides high quality wildlife habitat for a variety of more specialized terrestrial animals as described in Section 3.3.1.2. Such habitats have been rapidly disappearing in the region, along with the wildlife dependent on

them. Clearing a right-of-way through this habitat would adversely affect local populations of terrestrial animals. Construction would destroy some individuals and would serve as a barrier to movement for others. Most animals with relatively small home ranges and specialized habitat requirements, such as some small mammals, salamanders, frogs, snakes, and subterranean invertebrates, are unlikely to cross the drier, open habitat created by forest clearing. Some species of mole salamanders (*Ambystoma spp*.), for example, depend on vernal pools for annual mass breeding events. Although some individuals have been known to cross rights-of-way to migrate to breeding areas, rights-of-way serve as a barrier to others. This may ultimately decrease the breeding opportunities and affect genetic diversity among local populations. However, the forested wetland habitat that would be impacted by the proposed transmission line construction is small relative to similar adjoining areas. In addition, construction of the SR 45 Bypass and Old SR 45 (SR 145) had previously exposed the area to fragmentation, decreasing the area's value as a contiguous wildlife corridor. Implementation of the proposed project is therefore not expected to result in significant direct or cumulative adverse impacts to terrestrial animals.

An active barred owl nest was discovered in the proposed transmission line corridor near Plum Creek. As a Federal agency, TVA considers potential impacts to birds as directed by EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds). Construction of the proposed route potentially could adversely impact this nest if clearing of this forested portion of the route occurred before May 15. However, since clearing would not begin until fall 2003, no impacts are anticipated.

Other project-related impacts to songbirds could potentially come from the fragmentation of habitats. Due to the prominence of early successional and agriculturally modified habitats along the proposed route and in the vicinity, the project is not expected to result in adverse amounts of habitat fragmentation. Therefore, the proposed project is not expected to result in adverse direct or cumulative impacts to migratory birds.

4.3.2. Threatened and Endangered Species

4.3.2.1. Plants

No federally or state-listed plant species were observed within the areas expected to be impacted by the proposed project. Four state-listed plants (odorless mock-orange, rattle-vetch, spreading rockcress, and yellow parilla) occur approximately 125 feet south of the transmission line centerline at a point east of survey stake number 1070 and adjacent to Plum Creek. The project area where these plants are located would be considered an exclusion zone during construction of the proposed transmission line. No equipment would be permitted during clearing or construction of the transmission line within the exclusion zone.

One state-listed bur oak occurs about 1200 feet east of Tibby Creek and 60 feet north of survey stake number 3036 in a fence right-of-way. This was a mature, fruiting tree with a diameter at breast height (DBH) of approximately 20 inches. Prior to the TVA survey, no other occurrences of bur oak had been recorded for Noxubee County. Additional surveys were conducted and an additional seven healthy bur oak trees, five of them mature, were located near the proposed transmission line. Two of these were located north of the proposed transmission line and five south of the transmission line. The loss of one individual from a population of at least eight individuals in the vicinity is an insignificant impact.

Precautions would be taken to avoid impacts to the areas adjacent to the right-of-way containing state-listed plants. Therefore, no direct or cumulative impacts to federally or state-listed plant species are anticipated as a result of the proposed action.

4.3.2.2. Terrestrial Animals

The proposed project is not expected to result in adverse impacts to rare or protected species of animals or their habitats. Because much of the project area has been previously modified by past agricultural activities, there is little suitable habitat for rare and protected species of animals along the proposed route.

All records of red-cockaded woodpeckers in the county are restricted to the NNWR. Because suitable habitat for the species does not exist along the proposed project route, no adverse impacts would result to this species or any other federally listed species.

Sections of habitats restricted to the riparian areas along the Noxubee River represent suitable habitat for all three species of turtles, the southern coal skink, and the crayfish frog as described in Section 3.3.2.2. This riparian zone may also be used by transient bald eagles, osprey, and wood storks. If these turtles, skink, and crayfish frog occur in the area, construction may destroy some individuals and serve as a barrier to movement for others. However, the forested wetland habitat that would be destroyed by the proposed right-of-way construction is small relative to similar adjoining areas, and the area's value as a wildlife corridor has been previously decreased due to construction of SR 45 Bypass and Old SR 45. Best Management Practices (BMPs), specifically those designed to control erosion, would be employed at all stream crossings and within the riparian zones of Tibby Creek, Plum Creek, and the Noxubee River. This would limit the amount of sedimentation resulting from construction activities.

Because of the small amount of riparian habitat involved and with the use of BMPs to control erosion, the proposed project is not expected to result in any significant direct or cumulative adverse impacts to state-listed rare or protected species or their habitats.

4.3.2.3. Aquatic Animals

If this proposed line were constructed, measures including the implementation of Standard Stream Protection–Category A would be taken to prevent impacts to freckled darters and their habitats at all transmission line crossings of perennial streams. Intermittent streams and wet-weather conveyances would be protected using standard BMPs as outlined in Muncy (1999). With strict adherence to these BMPs, no direct or cumulative impacts to federally or state-listed aquatic animal species are likely to result from construction and maintenance activities on this proposed transmission line.

4.3.3. Wetlands

The proposed transmission line would cross 18 separate wetland areas identified as potential Federal jurisdictional wetlands with a total of about 10 acres within the proposed right-of-way. Nine of these wetlands, consisting of a total of about 4.1 acres, are forested wetlands, and the remaining wetlands are emergent or scrub-shrub wetlands.

Impacts to the emergent (W14) and scrub-shrub wetlands (W1, W2A, W3B, W3C, W3D, W4), and five of the forested wetland areas (W2, W3A, W5, W7, and W15) are expected to

be minor and insignificant with implementation of BMPs (Muncy, 1999), TVA Environmental Quality Specifications, and minimizing entry of vehicles or equipment into the wetlands. Although it is expected that the scrub-shrub wetlands would in time (decades) develop into forested wetlands, the initial clearing was likely done for agriculture or silviculture and was not performed by TVA. Thus, TVA's proposed action would maintain the scrub-shrub wetlands in their current successional stage or as emergent wetlands and would not result in any new impacts to forested wetlands. Impacts to the five listed forested wetland areas were determined to be insignificant based on the small size of the affected area in each of the wetlands, the position of the proposed right-of-way at the edge of the wetlands, and the existing fragmentation of these wetlands in an agricultural landscape.

The individual, local impacts resulting from the proposed project's conversion of an estimated 2.4 acres of forested wetlands to scrub-shrub wetlands in the Noxubee River floodplain (W6, W10, W11, and W12) are expected to contribute to the cumulative impacts resulting from the loss of forested wetland habitat and functions in the southeastern United States. The forest in these four wetlands is mature and well-developed structurally providing habitat niches in several vegetative strata, and high levels of biomass with associated habitat and water quality functions as described in Section 3.3.3.

While TVA complies with and takes action consistent with requirements to protect wetlands and has been successful in avoiding and minimizing wetlands impacts, some clearing and conversion of forested wetlands are unavoidable, especially for the expansion of the transmission system. Although the most recent new transmission line construction projects have resulted in a small acreage of unmitigated forested wetlands' conversion (<3.0 acres in fiscal year 2003), these projects will add to the cumulative loss of forested wetlands in the area and region.

For the proposed project, the conversion of forested wetlands would incrementally contribute to the cumulative impacts to forested wetlands in the region, but it is not expected to be considered a significant loss because of the minor amount of acreage involved (< 1% of the forested wetlands in the project area), the availability of similar habitat in the area, and the declining amount of loss in the region. With the implementation of BMPs (Muncy, 1999), TVA Environmental Quality Specifications, and minimizing entry of vehicles or equipment into the wetlands, these individual and cumulative impacts are expected to be further reduced. A Nationwide Permit for the proposed project has been issued by the USACE on September 3, 2003 (Appendix I). This permit did not identify any significant wetland issues associated with this project proposal.

4.3.4. Aquatic Ecology

Watercourses conveying surface water only during storm events (i.e., wet-weather conveyances or ephemeral streams) that could be affected by the proposed route would be protected by standard BMPs as identified in Muncy (1999). These BMPs are designed to minimize erosion and subsequent sedimentation in streams.

Intermittent and perennial streams within the project area, as well as their riparian habitats, would receive Standard Stream Protection-Category A as designated in TVA Transmission Construction Guidelines Near Streams (Appendix IV). The Category A designation is based on the variety of species and habitats that exist in intermittent and perennial streams and Federal and state requirements to avoid harming them. Criteria for this designation included evidence of aquatic life and/or the presence of a well-defined channel with rock or

soil substrate. SMZ width is determined by category and slope of land adjacent to the stream (Muncy, 1999). Depending on the slope of the surrounding land, SMZs would extend at least 50 feet from the stream bank on either side of the proposed crossing.

By following the appropriate Standard Stream Protection requirements on streams and impounded waters identified in Table 4-1, using BMPs, and following the guidelines in Appendices II, III, and IV, the design, construction, and maintenance of this transmission line would not result in significant impacts to aquatic life that is adapted to the variety of habitats in this reach of the Noxubee River and its tributaries. All construction and maintenance work, especially near streams, would be conducted following the requirements and recommendations presented in TVA's guidelines for environmental protection during transmission line construction and maintenance (Muncy, 1999). To minimize the potential for erosion and sedimentation, access to construction sites would be via existing maintenance access points. If no practicable alternative exists, trees along streams within the transmission line corridor and danger trees adjacent to the corridor would be cut; however, their stumps would not be removed and understory vegetation would be disturbed as little as possible. Where clearing of forested wetland areas is necessary, the low-growing woody vegetation remaining in the right-of-way would provide some level of the benefits to aquatic life associated with forested wetlands, such as erosion control, shading of water in the floodplain, and nutrient cycling provided by deciduous leaves. Maintenance activities along streams would be by mechanical cutting or by selective use of USEPA-registered herbicides. Permanent and temporary stream crossings would comply with appropriate Federal and state permitting requirements as well as any applicable designations and BMPs. Where herbicides are used, these chemicals would be applied following USEPA label restrictions and TVA BMPs.

4.3.5. Managed Areas

There are two Managed Areas and/or Ecologically Significant Sites within 3 miles of the proposed transmission line route and its associated switches. Plum Creek Bluff is north of the route, but the community it harbors may extend further south. No plant species considered rare in Mississippi were observed in the area of the proposed transmission line (Section 3.3.2.1). Martins Bluff Potential National Natural Landmark also has a core community site that is north of the route on Tibby Creek. The location where the route crosses the site at Tibby Creek is in pasture. The distances from the proposed route to each of these primary sites within Plum Creek Bluff and Martins Bluff are sufficient, so that no significant impacts are anticipated to the areas from the construction and operation of the transmission line and associated switches. In addition, no impacts to these areas are anticipated as a result of development of access to the right-of-way.

The route crosses the Noxubee River (listed on the National Rivers Inventory) and a cut-off of the river. BMPs for stream crossings (Standard Stream Protection-Category A) would be followed so that no impacts would occur to the Noxubee River from the construction and operation of the transmission line and its associated switches.

Table 4-1. Approximate Locations and Levels of Protection for Watercourses Within the Proposed Transmission Line Right-of-Way

Crossing Number	Approximate Watercourse Locations/Station Numbers	Watercourse Type*	Commitments	SMZ Widths
1	9+00	WWC	BMPs	N/A
2	16+49 – 17+49	Pond	Category A	50 feet
3	24+09 – 25+29	Perennial	Category A	50 feet
4	25+29 – 30+40	Perennial	Category A	50 feet
5	31+42	Perennial	Category A	50 feet
6	45+69 – 46+25	WWC	BMPs	N/A
7	51+10	WWC	BMPs	N/A
8	57+15	WWC	BMPs	N/A
9	61+53	WWC	BMPs	N/A
10	110+00 – 116+88	Intermittent	Category A	50 feet
11	119+49 – 122+00	Perennial	Category A	50 feet
12	132+00	WWC	BMPs	N/A
13	138+00	WWC	BMPs	N/A
14	152+81	Perennial	Category A	50 feet
15	156+86	Intermittent	Category A	50 feet
16	162+40 – 164+60	Intermittent	Category A	50 feet
17	174+94	WWC	BMPs	N/A
18	178+03 – 179+98	Pond	Category A	50 feet
19	187+20	WWC	BMPs	N/A
20	197+03	WWC	BMPs	N/A
21	197+71	WWC	BMPs	N/A
22	225+10 – 230+50	Intermittent	Category A	50 feet
23	233+67 – 240+84	Ponds	Category A	50 feet
24	241+30 – 241+83	Perennial	Category A	50 feet
25	244+23	WWC	BMPs	N/A
26	244+74	WWC	BMPs	N/A
27	251+28	Perennial	Category A	50 feet
28	272+51	WWC	BMPs	N/A
29	273+87	WWC	BMPs	N/A
30	277+97	Perennial	Category A	50 feet
31	292+80 – 294+40	Intermittent	Category A	50 feet
32	299+86	Intermittent	Category A	50 feet
33	306+46	WWC	BMPs	N/A

*WWC = wet-weather conveyance

*Perennial or intermittent stream type determined by level of flow and evidence of aquatic life during the site visit in March 2003.

N/A = not applicable

4.3.6. Recreation

There would be no effects on public recreation facilities, activities, or resources as a result of the proposed transmission line.

4.3.7. Floodplains

The proposed right-of-way would be located within the 100-year floodplains of the Noxubee River, Plum Creek, Tibby Creek, and other streams. Under EO 11988, an overhead transmission line and related support structures are considered to be a repetitive action in the 100-year floodplain. The construction of the support structures for the transmission line would not be expected to result in any increase in flood hazard either as a result of increased flood elevations or in changes in flow-carrying capacity of the streams. The proposed switches in the existing transmission line would be raised above the 100-year flood elevation to prevent damage to the switches. To minimize adverse impacts on natural and beneficial floodplain values, the right-of-way would be revegetated where natural vegetation is removed, and the removal of unique vegetation would be avoided. BMPs would be used during construction activities. The TVA subclass review criteria for transmission line location in floodplains would be followed to ensure floodplain impacts would be minimized. Impacts to floodplains and flooding are therefore expected to be insignificant.

4.3.8. Groundwater

Because the project area is underlain by a thick clay-confining unit, any impacts to groundwater would be insignificant.

4.3.9. Surface Water

Soil disturbances associated with access roads or other construction activities can potentially result in adverse water quality impacts. Erosion and sedimentation can clog small streams and threaten aquatic life. Removal of the tree canopy along stream crossings can result in increased water temperatures and adverse impacts to aquatic biota. Improper use of herbicides to control vegetation could result in runoff to streams and subsequent aquatic impacts.

Precautions would be included in the project design, construction, and maintenance to limit these potential impacts to insignificant levels. Permanent stream crossings would be made so as not to impede runoff patterns and the natural movement of aquatic fauna. Temporary stream crossings and other construction and maintenance activities would comply with appropriate state permit requirements and TVA requirements as described in Muncy (1999). Canopies in all SMZs would be left undisturbed unless there is no practicable alternative. Right-of-way maintenance in SMZs would employ manual and low-impact methods wherever possible. In areas requiring chemical treatment, only USEPA-registered herbicides used in accordance with label directions would be used. Implementation of these measures would help ensure that any impacts to surface water are insignificant.

4.3.10. Visual

Impacts to visual resources are examined in terms of changes between the existing landscape character and proposed actions, sensitivity of viewing points available to the general public, their viewing distances, and visibility of proposed changes. These

measures help identify changes in visual character based on commonly held perceptions of landscape beauty and the aesthetic sense of place. The foreground, middleground, and background viewing distances were previously described in the Affected Environment Section. The impacts to visual resources are described in the same manner as the existing visual resources, from west to east along the proposed route.

At the point of connection to the existing Columbus–DeKalb 161-kV Transmission Line, motorists would have foreground views of the new structures associated with the transmission line and right-of-way. These new structures would be similar in character to the existing wooden pole structures that currently parallel the roadway, and their addition would result in a negligible alteration to the existing landscape character. Duration of views along SR 145 would be brief, as motorists travel to and from the city of Macon. As the transmission line continues, views would be limited to those few accessible viewpoints described in Chapter 3, Section 3.3.10.

At the crossing of the Noxubee River and its embayment, heavy vegetation would obscure views from the middleground and background distances. Views of the transmission lines and the associated right-of-way would be available to recreational users in the foreground viewing distance. However, these views of the route would be available only briefly, and from between structures, thus not significantly affecting the scenic value of the Noxubee River.

The route would pass a light industrial facility and constructed reservoir. Views from the facility would be seen in the foreground of mature vegetation. From the middleground viewing distance, the addition of the transmission line and associated structures would be less contrasting against the background of vegetation.

As the proposed transmission line approaches the SR 45/Hall Road intersection, existing transmission lines are visible from every vantage point. Existing residences to the north and south would have views of the new transmission line, as would the light industrial facility and small church on opposing sides of SR 45; however, the views available at these locations and from these vantage points would differ very little from existing wooden pole structures and transmission lines crossing and paralleling the intersection and roadway.

As the proposed route travels into more forested lands, views of the transmission line and structures would be limited to the foreground viewing distance, and the number of viewers would be minimal as there are few points of access to the proposed route in this section. The number of residences increases prior to reaching Elon Road, and residents would have views of the transmission line and structures from the foreground viewing distance. The transmission line would be visually similar to the existing lines and associated structures. The introduction of new steel poles would contrast less with the existing wooden poles as they weather and become a muted dark grey color.

Traveling eastward through agricultural lands, the proposed transmission line would be visible from the foreground and middleground distances, but the number of viewers would be minimal. Even as the proposed route approaches and crosses Plum Creek, views of the transmission line and associated structures would be left to the occasional recreational user and landowner. Views of the proposed route would continue to be obscured by vegetation, topography, and lack of available viewpoints approaching Poag Road, where the transmission line would be visible to motorists in the foreground distance only briefly. Continuing eastward, the transmission line would recede into the forestland. The few

residents in the vicinity would have very limited views of the proposed transmission line until it reaches more open agricultural lands.

Nearing Paulette Road, residents and motorists would view the proposed transmission line and structures from the foreground and middleground. Similar existing structures are currently visible from these viewpoints. From the middleground viewing distance, the level of discernable details of the transmission line and structures would decrease, as would the impacts to the existing landscape character. From many vantage points, the proposed route would be seen against a background of vegetation, thus appearing as a broader element in the landscape.

As the route crosses Paulette Road and terminates at the proposed substation facility, views would be briefly available to motorists in the foreground viewing distance. The residents in the vicinity of the proposed crossing would have views of the transmission line and associated structures in the foreground distance. The introduction of this new transmission line would contrast little with the existing landscape character, as similar structures are currently visible from these vantage points.

In its entirety, the proposed route would traverse the rural, sparsely habited Mississippi countryside, which is infrequently crossed by major travel ways. Temporary visual discord would be evident during the construction phases of the project that could include heavy equipment operated throughout the proposed route, and the use of material and construction staging areas. This temporary alteration to the visual character would be minor and would not be noticeable after restoration. The existing landscape character and visual resources would be altered by the construction, operation, and maintenance of the proposed right-of-way, 161-kV transmission line, and associated structures, which would increase the number of discordant elements in the landscape. However, the changes that would be visible after construction would not contribute to the loss of established landscape character or a degradation of the visual resources. Therefore, impacts to visual resources associated with this project would be insignificant.

4.3.11. Cultural Resources

4.3.11.1. Archaeological and Historic Sites

The archaeological and historical survey of the project's APE identified archaeological site 20NO601 and historic structure 103-MAC-5022. Neither of these properties was found to be eligible for listing in the NRHP. TVA submitted its findings and determinations to the Mississippi State Historic Preservation Officer on February 13, 2003, whose concurrence was obtained when he chose not to respond within the 30-day period provided by applicable regulations. The proposed project does not have the potential to affect any historic properties.

4.4. Post Construction Impacts

4.4.1. Electric and Magnetic Fields

TVA recognizes there is public concern about whether any adverse health effects are caused by electric and magnetic fields (EMF) that result from generation, transmission, distribution, and use of electricity. Many scientific research efforts and other studies examining the potential health and other effects of EMF have been and are still being done.

TVA is aware of, and ensures that it stays aware of, published research and study results and directly supports some of the research and study efforts.

Studies, interpretations, and research to date are far from conclusive about potential associations between EMF and possible health impacts. A few studies have been interpreted as suggesting a weak statistical relationship between EMF and some rare forms of cancer. During the summer of 2001, the International Association for Research on Cancer (Association) reviewed available epidemiological studies and concluded that childhood leukemia appears to be associated with magnetic fields, but that there was not a cause-and-effect relationship. It was concluded that the risk is small but may in some circumstances of higher exposure result in one type of childhood leukemia. The Association also concluded that electric fields do not have an association with cancer.

However, equal or greater numbers of similar studies show no association or cannot reproduce data interpreted as demonstrating an association. No laboratory research has found cause-and-effect health impacts from EMF and certainly none that are adverse. Neither has any concept of how these fields could cause health effects achieved scientific consensus.

There is also no agreement in the scientific or EMF-research community as to what if any electric or magnetic field parameters might be associated with potential health effects. There are no scientifically or medically defined safe or unsafe field strengths, although state regulatory bodies in Florida and New York have established edge of right-of-way magnetic field strength limits for 230-kV and larger power transmission lines.

TVA has analyzed and continues to analyze the fields associated with its typical line designs using the best available models and has measured actual fields for a large number of locations along its transmission line easements. Both model data and measurements show that the field strengths for TVA transmission lines are well within Florida and New York limits. Based on such models, expected field strengths for the proposed lines discussed in this document would also be within those existing state guidelines.

TVA's standard location practice has the effect of minimizing continuous public exposures to transmission line EMF. The transmission line route selection team uses a constraint model that places a 300-foot radius buffer around occupied buildings, except schools for which a 1200-foot buffer is used. The purpose of these buffers is to reduce potential land use conflicts with yard trees, outbuildings, and ancillary facilities and potential visual impacts, as well as exposures to EMF. Though not absolute location constraints, these buffers weigh heavily in location decisions, influencing selection of route options and alignments. Because EMF diminishes quickly with distance from the conductors, the routing of transmission lines using constraint buffers effectively reduces potential continuous public exposure to EMF. Crossing under lines or otherwise being near them for short periods may increase overall EMF exposure but only minutely.

4.4.2. Other Impacts

No significant impacts are expected to result from the relatively short-term activities of construction, such as noise, solid waste, etc. Appendices II and III contain procedures for dealing with these issues.

4.5. Irreversible and Irretrievable Commitment of Resources

The materials used for construction of the proposed facilities would be committed for the life of the facilities. Some materials, such as ceramic insulators and concrete foundations, may be irrevocably committed, but the metals used in equipment, conductors, and supporting steel structures could be recycled. The useful life of steel pole transmission structures is expected to be at least 60 years.

The rights-of-way used for the transmission lines would not be irreversibly committed and could be returned to other uses upon retirement of the line. In the interim, compatible uses of the right-of-way could continue.

Forest products and related wildlife that might have grown on the presently forested portions of the right-of-way would be lost for the life of the project. No locally or regionally significant lost forest or agricultural production would be expected.

4.6. Unavoidable Adverse Effects

As previously stated, clearing for this transmission line would result in the removal of approximately 34 acres of forests. After completion of the transmission line, trees would not be permitted to grow within the right-of-way or to a determined height adjacent to the right-of-way that would endanger the transmission line.

Clearing and construction would result in the disruption of some wildlife, but no permanent habitat changes would occur except in the wooded areas previously described.

Any burning of cleared material would result in some short-term air pollution.

Clearing, tree removal, and excavation for pole erection would result in a small amount of short-term localized siltation.

Transmission line visibility would be minimized through the location; however, there would be some degree of visual effect on the landscape in the project area.

4.7. Relationship Between Local Short-Term Uses of the Environment and Long-Term Productivity

The construction and operation of the proposed transmission line would supply electricity to meet the loads present and expected in the southeast portion of Noxubee County, Mississippi, near Macon. This would be accomplished by a localized shift of a small amount of land to use for electric power transmission. If, during the useful life of the transmission line, it is no longer needed or technology renders it obsolete, it can be removed with relatively little difficulty. The land encumbered by the right-of-way could be returned to its previous use or used for other purposes.

The principal change in short-term use of the right-of-way would be the exclusion of trees and permanent structures. The amount of forest being lost is approximately 34 acres within the right-of-way area, and areas removed from production are dispersed along the length of the line. The right-of-way cannot support building construction for the life of the project, but the social and economic benefits of the project should outweigh this loss.

Page intentionally blank

CHAPTER 5

5. SUPPORTING INFORMATION

5.1. List of Preparers

Christopher A. Austin
Position: TVA Civil Engineer - Siting and Environmental Design
Involvement: Project and Siting Alternatives

Hugh S. Barger
Position: TVA Environmental Engineer - Siting and Environmental Design
Involvement: Purpose of and Need for Action; Alternatives Including Proposed Action

John T. Baxter
Position: TVA Biologist - Aquatic
Involvement: Threatened and Endangered Species - Aquatic Animals

J. Leo Collins
Position: TVA Senior Botanist
Involvement: Terrestrial Ecology - Terrestrial Plants; Threatened and Endangered Species - Terrestrial Plants

Bridget M. Donaldson
Position: TVA Contract Zoologist
Involvement: Terrestrial Ecology - Terrestrial Animals; Threatened and Endangered Species - Terrestrial Animals

Nancy D. Fraley
Position: TVA Natural Areas Coordinator
Involvement: Managed Areas; Terrestrial Ecology - Invasive Plant Species

Ella (Tina) Guinn
Position: TVA Contract Natural Areas Specialist
Involvement: Managed Areas; Terrestrial Ecology - Invasive Plant Species

James R. Hagerman
Position: TVA Environmental Engineer
Involvement: Erosion Control and Surface Water

T. Hill Henry
Position: TVA Senior Zoologist
Involvement: Terrestrial Ecology - Terrestrial Animals; Threatened and Endangered Species - Terrestrial Animals

John M. Higgins
Position: TVA Water Quality Specialist
Involvement: Surface Water

Amy Denise Hill
Position: TVA Archaeologist
Involvement: Cultural Resources

Britta P. Lees
Position: TVA Contract Botanist
Involvement: Terrestrial Ecology - Terrestrial Plants; Threatened and Endangered Species - Terrestrial Plants

Anita E. Masters
Position: TVA Senior NEPA Specialist
Involvement: NEPA Compliance and Document Preparation

Jack D. Milligan
Position: TVA Groundwater Specialist
Involvement: Groundwater

Roger A. Milstead
Position: TVA Floodplain Specialist
Involvement: Floodplains

Charles P. Nicholson
Position: TVA NEPA Team Leader
Involvement: NEPA Compliance and Document Preparation

George E. Peck
Position: TVA Aquatic Biologist
Involvement: Aquatic Ecology

Richard L. Pflueger
Position: TVA Land Use and Recreation Specialist
Involvement: Recreation

Kim Pilarski
Position: TVA Wetlands Biologist
Involvement: Wetlands

Jon C. Riley
Position: TVA Landscape Architect
Involvement: Visual

W. Richard Yarnell
Position: TVA Archaeologist
Involvement: Cultural Resources

5.2. Literature Cited

Automated Resource Information Center. 2003. www.maris.state.ms.us.

Braun, E. L. 1950. Deciduous Forests of Eastern North America. The Blakiston Company, Philadelphia, 596 pages.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetland and deepwater habitats of the United States. Washington, D.C. United States Fish and Wildlife Publication FWS/OBS-79/31.

Dahl, T. E. 2000. Status and trends of wetlands in the conterminous United States 1986 to 1997. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

Duncan, J. Nationwide Rivers Inventory. October 5, 2001. National Park Service. http://www.nps.gov/ncrc/programs/rtca/nri/states/ms.html (March 24, 2003).

Environmental Laboratory. 1987. Corps of Engineers wetland delineation manual, technical report Y-87-1. United States Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

Fenneman, N. M. 1938. Physiography of Eastern United States. McGraw-Hill Book Company, Inc., New York, 714 pages.

Hefner, J. M., B. O. Wilen, T. E. Dahl, and W. E. Frayer. 1994. Southeast wetlands, status, and trends. Cooperative publication by United States Department of the Interior, Fish and Wildlife Service, and the United States Environmental Protection Agency.

Muncy, J. A. 1999. A guide for environmental protection and best management practices for Tennessee Valley Authority transmission construction and maintenance activities (*revised*). Technical note TVA/LR/NRM 92/1. Tennessee Valley Authority, Norris, Tennessee. Chris Austin, Chris Brewster, Alicia Lewis, Kenton Smithson, Tina Broyles, Tom Wojtalik, eds.

Price, G., R. Nichols, J. Holland, M. Wild, and L. Pietak. 2003. Cultural resources survey of Columbus-DeKalb 161-kV Transmission Line Tap to Paulette, Noxubee County, Mississippi. Technical report submitted to TVA Cultural Resources Program, Norris Tennessee.

Reed, P. B., Jr. 1997. Revised national list of plant species that occur in wetlands: national summary. United States Fish and Wildlife Service biological report 88(24).

Ross, S. T., and W. M. Brenneman. 1991. Distribution of fishes in Mississippi. Mississippi Department of Wildlife, Fisheries, and Parks, Bureau of Fisheries and Wildlife, Jackson, Mississippi, 545 pages.

United States Fish and Wildlife Service. 2001. Report to Congress on the status and trends of wetlands in the conterminous United States 1986 to 1997.

United States Geological Survey, 2003. http://terraserver-usa.com.

5.3. Glossary of Terms

°F	Degree Fahrenheit
<	Greater than
>	Less than
APE	Area of Potential Effect
Aquifer	An underground layer of sand, gravel, or porous rock in which water collects
BMP	Best Management Practice - A set of practices that are the most effective and practical means of preventing or reducing nonpoint sources of pollution to a level compatible with water quality standards
cfs	cubic feet per second
Cultural Resources	Historic and archaeological properties, properties of traditional and cultural significance, sacred sites, Native America human remains, and cultural landscapes entitled to special consideration under Federal laws and regulations
DBH	Diameter breast height
Emergent wetland	A wetland characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens usually dominated by perennial plants and present for most of the growing seasons in most years
EMF	Electric and magnetic fields produced around the electric conductor when a transmission line is in operation
Endangered Species	A species in danger of extinction throughout all or a significant portion of its range
EO	Executive Order
EPA	Electric Power Association
Floodplain	A flat expanse of land bordering a body of water
Forested wetland	A wetland with the majority of the coverage represented by trees that are 20 feet or taller
Fragmentation	The process of breaking up a large area of relatively uniform habitat into one or more smaller, disconnected areas
GIS	Geographic Information System
Herbaceous	With the characteristics of an herb; a plant with no persistent woody stems above ground
Hydrophytes	Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content
Invasive species	A species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health
kV	Kilovolt - 1000 volts, a measure of voltage, the force that causes a current to flow in an electrical circuit

MVA	Megavolt ampere
MW	Megawatt
NNWR	Noxubee National Wildlife Refuge
NOST	No state status assigned
NRHP	National Register of Historic Places
Riparian	Vegetated areas surrounding lakes, rivers, streams, and wetlands
Scrub-Shrub wetland	A wetland dominated by woody vegetation less than 20 feet tall
Section 303(d) list	As defined by the Clean Water Act, a list of water bodies that are considered “water quality limited” by not meeting state water quality standards or expected to exceed water quality standards in the next 2 years and need additional pollution controls
Shrub	A woody plant which at maturity is usually less than 20 feet tall and generally exhibits several erect, spreading, or prostrate stems and has a bushy appearance
SMZ	Streamside Management Zone
SR	State Route
Threatened species	A species likely to become endangered within the foreseeable future
TVA	Tennessee Valley Authority
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USNPS	United States National Park Service
Wetland	An area inundated by surface water or groundwater with a frequency sufficient to support vegetation or aquatic life that requires saturated or seasonably saturated soil conditions for growth and reproduction

Page intentionally blank

APPENDIX I - CORRESPONDENCE

Page intentionally blank

Hugh S. Barger
Environmental Engineer
Tennessee Valley Authority
Siting and Environmental Design
MR 4G Missionary Ridge Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Barger:

COLUMBUS-DEKALB 161-kV TRANSMISSION LINE -TAP TO PAULETTE

This is in reference to TVA's project mailed to me on April 15, 2003.

The project as described by the project summary creates no incompatibility in our area of planning at this time.

E. Claiborne Barnwell

Signature

Environmental Division

Title Engineer

Ms Dept. of Transportation

Agency

401 Northwest St.

Address

Jackson, Ms 39202

Hugh S. Barger
Environmental Engineer
Tennessee Valley Authority
Siting and Environmental Design
MR 4G Missionary Ridge Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Barger:

COLUMBUS-DEKALB 161-kV TRANSMISSION LINE -TAP TO PAULETTE

This is in reference to TVA's project mailed to ~~me~~ D.E. Stewart on April 15, 2003.

The project as described by the project summary creates no incompatibility in our area of planning at this time.

Bob L. Marsh
Signature

Deputy Administrator
Title

MS Public Utilities Staff
Agency

P.O. Box 1174
Address
Jackson, MS
39215

Remove: D.E. Stewart
Add: Bob L. Marsh

Thank you
Bob Marsh
601-961-5488

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

September 3, 2003

REPLY TO ATTENTION OF:
Regulatory Branch
Operations Division

SUBJECT: Nationwide Permit Authorization - Jurisdictional Number MSNW03-02829-D

Tennessee Valley Authority
Attention: Mr. Hugh Barger
1101 Market Street
Chattanooga, Tennessee 37402-2801

Dear Mr. Barger:

Reference is made to your request to construct a 161 kV transmission line known as the Columbus - DeKalb to Paulette Mississippi Project.

This letter verifies that your proposed project is already authorized by Nationwide Permit Number 12 in accordance with 33 CFR Part 330 of our regulations. A copy is enclosed with the appropriate sections marked for your reference. Further authorization from this office is not required provided the scope of work is in accordance with your submitted plans and the Nationwide Permit conditions.

The statements contained herein do not convey any property rights, or any exclusive privileges, and do not authorize any injury to property or obviate the requirements to obtain other local, State or Federal assent required by law.

The enclosed Notice of Authorization must be posted at the site during construction of the permitted activity. If the scope of work or project location changes, you are urged to contact this office for a verification of this determination.

Please be advised that this jurisdictional determination reflects current policy and regulations. This Nationwide Permit authorization will expire March 19, 2007.

By Letter dated March 15, 2002, the Mississippi Department of Environmental Quality, Office of Pollution Control, has certified that work authorized by this

Nationwide Permit will be in compliance with he applicable provisions of Sections, 301, 302, 303, 306 and 307 of the Clean Water Act (33 USC 1341) and Section 49-17-29 of the Mississippi Code of 1972, subject to the enclosed conditions.

If you have any questions or require further information concerning this matter, please contact Mr. Joe Tanko of the Enforcement Section at (251) 694-3779.

Sincerely,

Ronald A. Krizman
Chief, Regulatory Branch
Operations Division

Enclosure

APPENDIX II – TENNESSEE VALLEY AUTHORITY RIGHT-OF-WAY CLEARING SPECIFICATIONS

Page intentionally blank

APPENDIX II – TENNESSEE VALLEY AUTHORITY RIGHT-OF-WAY CLEARING SPECIFICATIONS

1. General - The clearing contractor shall review the environmental evaluation documents (Categorical Exclusion Checklist, Environmental Assessment, or Environmental Impact Statement) for the project or proposed activity, along with all clearing and construction appendices, conditions in applicable general and/or site-specific permits, the storm water pollution prevention plan, and any Tennessee Valley Authority (TVA) commitments to property owners. The contractor shall then plan and carry out operations using techniques consistent with good engineering and management practices as outlined in TVA's Best Management Practice (BMP) manual (Muncy, 1992, and revisions thereto). The contractor will protect areas that are to be left unaffected by access or clearing work at and adjacent to all work sites. In sensitive areas and their buffers, the contractor will retain as much native ground cover and other vegetation as possible.

   If the contractor fails to use BMPs or to follow environmental expectations discussed in the prebid or prework meeting or present in contract specifications, TVA will order corrective changes and additional work as deemed necessary in TVA's judgment to meet the intent of environmental laws and regulations or other guidelines. Major violations or continued minor violations will result in work suspension until correction of the situation is achieved or other remedial action is taken at the contractor's expense. Penalty clauses may be invoked as appropriate.

2. Regulations - The clearing contractor shall comply with all applicable federal, state, and local environmental and antipollution laws, regulations, and ordinances including without limitation all air, water, solid and hazardous waste, noise, and nuisance laws, regulations, and ordinances. The contractor shall secure or ensure that TVA has secured all necessary permits or authorizations to conduct work on the acres shown on the drawings and plan and profile for the contract. The contractor's designated project manager will actively seek to prevent, control, monitor, and safely abate all commonly recognized forms of workplace and environmental pollution. Permits or authorizations and any necessary certifications of trained or licensed employees shall be documented with copies submitted to TVA's right-of-way inspector or construction environmental engineer before work begins. The contractor will be responsible for meeting all conditions specified in permits. Permit conditions shall be reviewed in prework discussions.

3. Land and Landscape Preservation - The clearing contractor shall exercise care to preserve the condition of cleared soils by avoiding as much compacting and deep scarring as possible. As soon as possible after initial disturbance of the soil and in accordance with any permit(s) or other state or local environmental regulatory requirements, cover material shall be placed to prevent erosion and sedimentation of water bodies or conveyances to surface water or groundwater. In areas outside the clearing, use, and access areas, the natural vegetation shall be protected from damage. The contractor and his employees must not deviate from delineated access routes or use areas, and must enter the site at designated areas that will be marked. Clearing operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the remaining natural vegetation and adjacent surroundings in the vicinity of the work. In sensitive public or environmental areas, appropriate buffer

zones shall be observed and the methods of clearing or reclearing modified to protect the buffer and sensitive area. Some areas may require planting native plants or grasses to meet the criteria of regulatory agencies or commitments to special program interests.

4. Streamside Management Zones - The clearing contractor must leave as many rooted ground cover plants as possible in buffer zones along streams and other bodies of water or wet-weather conveyances thereto. In such streamside management zones (SMZ), tall-growing tree species (trees that would interfere with TVA's National Electric Safety Code clearances) shall be cut, and the stumps may be treated to prevent resprouting. Low-growing trees identified by TVA as marginal electrical clearance problems may be cut, and then stump treated with growth regulators to allow low, slow-growing canopy development and active root growth. Only approved herbicides shall be used, and herbicide application shall be conducted by certified applicators from the TVA's Transmission, Operations, and Maintenance organization after initial clearing and construction. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment, such as a feller-buncher. The method will be selected based on site-specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. Disturbed soils in SMZs must be stabilized by appropriate methods immediately after the right-of-way is cleared. Stabilization must occur within the time frame specified in applicable storm water permits or regulations. Stumps within SMZs may be cut close to the ground but must not be removed or uprooted. Trees, limbs, and debris shall be immediately removed from streams, ditches, and wet areas using methods that will minimize dragging or scarring the banks or stream bottom. No debris will be left in the water or watercourse. Equipment will cross streams, ditches, or wet areas only at locations designated by TVA after the application of appropriate erosion control BMPs consistent with permit conditions or regulatory requirements.

5. Wetlands - In forested wetlands, tall trees will be cut near the ground, leaving stumps and roots in place. The cambium may be treated with herbicides applied by certified applicators from the TOM organization to prevent regrowth. Understory trees that must be initially cut and removed may be allowed to grow back or may be treated with tree growth regulators selectively to slow growth and increase the reclearing cycle. The decision will be situationally made based on existing ground cover, wetland type, and tree species since tall tree removal may "release" understory species and allow them to grow quickly to "electrical clearance problem" heights. In many circumstances, herbicides labeled for water and wetland use may be used in reclearing.

6. Sensitive Area Preservation - If prehistoric or historic artifacts or features that might be of archaeological significance are discovered during clearing or reclearing operations, the activity shall immediately cease within a 100-foot radius, and a TVA right-of-way inspector or construction environmental engineer and the Cultural Resources Program manager shall be notified. The site shall be protected and left as found until a determination about the resources, their significance, and site treatment is made by TVA's Cultural Resources Program. Work may continue beyond the finding zone and the 100-foot radius beyond its perimeter.

7. Water Quality Control - The contractor's clearing and disposal activities shall be performed using BMPs that will prevent erosion and entrance of spillage, contaminants, debris, and other pollutants or objectionable materials into drainage

ways, surface water, or groundwater. Special care shall be exercised in refueling equipment to prevent spills. Fueling areas shall be remote from any sinkhole, crevice, stream, or other water body. Open burning debris will be kept away from streams and ditches and shall be incorporated into the soil.

The clearing contractor will erect and (when TVA or contract construction personnel are unable) maintain BMPs such as silt fences on steep slopes and adjacent to any stream, wetland, or other water body. BMPs will be inspected by the TVA field engineer or other designated TVA or contractor personnel routinely and during periods of high runoff, and any necessary repairs will be made as soon as practicable. BMP inspections will be conducted in accordance with permit requirements. Records of all inspections will be maintained on site, and copies of inspection forms will be forwarded to the TVA construction environmental engineer.

8. Turbidity and Blocking of Streams - If temporary clearing activities must interrupt natural drainage, appropriate drainage facilities and erosion/sediment controls shall be provided to avoid erosion and siltation of streams and other water bodies or water conveyances. Turbidity levels in receiving waters or at storm water discharge points shall be monitored, documented, and reported if required by the applicable permit. Erosion and sediment control measures such as silt fences, water bars, and sediment traps shall be installed as soon as practicable after initial access, site or right-of-way disturbance in accordance with applicable permit or regulatory requirements.

   Mechanized equipment shall not be operated in flowing water except when approved and, then, only to construct necessary stream crossings under direct guidance of TVA. Construction of stream fords or other crossings will only be permitted at approved locations and to current TVA construction access road standards. Material shall not be deposited in watercourses or within stream bank areas where it could be washed away by high stream flows. Any clearing debris that enters streams or other water bodies shall be removed as soon as possible. Appropriate U.S. Army Corps of Engineers and state permits shall be obtained for stream crossings.

9. Air Quality Control - The clearing or reclearing contractor shall take appropriate actions to limit the amount of air emissions created by clearing and disposal operations to well within the limits of clearing or burning permits and/or forestry or local fire department requirements. All operations must be conducted in a manner that prevents nuisance conditions or damage to adjacent land crops, dwellings, highways, or people.

10. Dust and Mud Control - Clearing activities shall be conducted in a manner that minimizes the creation of fugitive dust. This may require limitations as to type of equipment, allowable speeds, and routes utilized. Control measures such as water, gravel, etc., or similar measures may be used subject to TVA approval. On new construction sites and easements, the last 100 feet before an access road approaches a county road or highway shall be graveled to prevent transfer of mud onto the public road.

11. Burning - The contractor shall obtain applicable permits and approvals to conduct controlled burning. The contractor will comply with all provisions of the permit, notification, or authorization including burning site locations, controlled draft, burning hours, and such other conditions as stipulated. If weather conditions such as wind speed or wind direction change rapidly, the contractor's burning operation may be

temporarily stopped by TVA's field engineer. The debris to be burned shall be kept as clean and dry as possible and stacked and burned in a manner that produces the minimum amount of smoke. Residue from burning will be disposed of according to permit stipulations. No fuel starters or enhancements other than kerosene will be allowed.

12. Smoke and Odors - The contractor will properly store and handle combustible and volatile materials that could create objectionable smoke, odor, or fumes. The contractor shall not burn oil or refuse that includes trash, rags, tires, plastics, or other manufactured debris.

13. Vehicle Exhaust Emissions - The contractor shall maintain and operate equipment in a manner that limits vehicle exhaust emissions. Equipment and vehicles will be kept within the manufacturers' recommended limits and tolerances. Excessive exhaust gases will be eliminated, and inefficient operating procedures will be revised or halted until corrective repairs or adjustments are made.

14. Vehicle Servicing - Routine maintenance of personal vehicles will not be performed on the right-of-way. However, if emergency or "have to" situations arise, minimal/temporary maintenance to personal vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Heavy equipment will be serviced on the right-of-way, except in designated sensitive areas. The clearing or reclearing contractor will properly maintain these vehicles with approved spill protection controls and countermeasures. If emergency maintenance in a sensitive or questionable area arises, the area environmental coordinator or construction environmental engineer will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.

15. Noise Control - The contractor shall take steps to avoid the creation of excessive sound levels for employees, the public, or the site and adjacent property owners. Concentration of individual noisy pieces as well as the hours and locations of operation should be considered.

16. Noise Suppression - All internal combustion engines shall be properly equipped with mufflers. The equipment and mufflers shall be maintained at peak operating efficiency.

17. Sanitation - A designated representative of TVA or the clearing contractor shall contact a sanitary contractor who will provide sanitary chemical toilets convenient to all principal points of operation for every working party. The facilities shall comply with applicable federal, state, or local health laws and regulations. They shall not be located closer than 100 feet to any stream or tributary or to any wetland. The facilities shall be required to have proper servicing and maintenance, and the waste disposal contractor shall verify in writing that the waste disposal will be in state-approved facilities. Employees shall be notified of sanitation regulations and shall be required to use the toilet facilities.

18. Refuse Disposal - The clearing or reclearing contractor shall be responsible for daily cleanup and proper labeling, storage, and disposal of all refuse and debris on the site produced by his operations and employees. Facilities that meet applicable regulations

and guidelines for refuse collection will be required. Only approved transport, storage, and disposal areas shall be used.

19. Brush and Timber Disposal (Reclearing) - The reclearing contractor shall place felled tree boles in neat stacks at the edge of the right-of-way, with crossing breaks at least every 100 feet. Property owner requests shall be reviewed with the project manager or right-of-way specialist before accepting them. Lop and drop activities must be specified in the contract and on plan and profile drawings with verification with the right-of-way specialist before conducting such work. When tree trimming and chipping is necessary, disposal of the chips on the easement or other locations on the property must be with the consent of the property owner and the approval of the right-of-way specialist. No trees, branches, or chips shall remain in a surface water body or be placed at a location where washing into a surface water or groundwater source might occur.

20. Brush and Timber Disposal (Initial Clearing) - For initial clearing, trees are commonly part of the contractor's contract to remove as they wish. Trees may be removed from the site for lumber or pulpwood or they may be chipped or stacked and burned. All such activities must be coordinated with the TVA field engineer, and the open burning permits, notifications, and regulatory requirements must be met. Trees may be cut and left in place only in areas specified by TVA and approved by appropriate regulatory agencies. These areas may include sensitive wetlands or SMZs where tree removal would cause excessive ground disturbance or in very rugged terrain where windrowed trees are used as sediment barriers along the edge of the right-of-way.

21. Restoration of Site - All disturbed areas, with the exception of farmland under cultivation and any other areas as may be designated by TVA's specifications, shall be stabilized in the following manner unless the property owner and TVA's engineer specify a different method:

    A. The subsoil shall be loosened to a minimum depth of 6 inches if possible and worked to remove unnatural ridges and depressions.

    B. If needed, appropriate soil amendments will be added.

    C. All disturbed areas will initially be seeded with a temporary ground cover such as winter wheat, rye, or millet, depending on the season. Perennials may also be planted during initial seeding if proper growing conditions exist. Final restoration and final seeding will be performed as line construction is completed. Final seeding will consist of permanent perennial grasses such as those outlined in TVA's "A Guide for Environmental Protection and Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities." Exceptions would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor.

    D. TVA holds the option, depending upon the time of year and weather condition, to delay or withdraw the requirement of seeding until more favorable planting conditions are certain. In the meantime, other stabilization techniques must be applied.

Revision July 2003

Page intentionally blank

APPENDIX III – TENNESSEE VALLEY AUTHORITY ENVIRONMENTAL QUALITY PROTECTION SPECIFICATIONS FOR TRANSMISSION LINE CONSTRUCTION

Page intentionally blank

APPENDIX III – TENNESSEE VALLEY AUTHORITY ENVIRONMENTAL QUALITY PROTECTION SPECIFICATIONS FOR TRANSMISSION LINE CONSTRUCTION

1. General – Tennessee Valley Authority (TVA) and/or the assigned contractor shall plan, coordinate, and conduct operations in a manner that protects the quality of the environment and complies with TVA's environmental expectations discussed in the preconstruction meeting. This specification contains provisions that shall be considered in all TVA and contract construction operations. If the contractor fails to operate within the intent of these requirements, TVA will direct changes to operating procedures. Continued violation will result in a work suspension until correction or remedial action is taken by the contractor. Penalties and contract termination will be used as appropriate. The costs of complying with the Environmental Quality Protection Specifications are incidental to the contract work, and no additional compensation will be allowed. At all structure and conductor pulling sites, protective measures to prevent erosion will be taken immediately upon the end of each step in a construction sequence, and those protective measures will be inspected and maintained throughout the construction and right-of-way rehabilitation period.

2. Regulations - TVA and/or the assigned contractor shall comply with all applicable federal, state, and local environmental and antipollution laws, regulations, and ordinances related to environmental protection and prevention, control, and abatement of all forms of pollution.

3. Use Areas - TVA and/or the assigned contractor's use areas include but are not limited to site office, shop, maintenance, parking, storage, staging, assembly areas, utility services, and access roads to the use areas. The construction contractor shall submit plans and drawings for their location and development to the TVA engineer and project manager for approval. Secondary containment will be provided for fuel and petroleum product storage pursuant to 29CFR1910.106(D)(6)(iii)(OSHA).

4. Equipment - All major equipment and proposed methods of operation shall be subject to the approval of TVA. The use or operation of heavy equipment in areas outside the right-of-way, access routes, or structure, pole, or tower sites will not be permitted without permission of the TVA inspector or field engineer. Heavy equipment use on steep slopes (greater than 20 percent) and in wet areas will be held to the minimum necessary to construct the transmission line. Steps will be taken to limit ground disturbance caused by heavy equipment usage, and erosion and sediment controls will be instituted on disturbed areas in accordance with state requirements.

   No subsurface ground-disturbing equipment or stump-removal equipment will be used by construction forces except on access roads or at the actual structure, pole, or tower sites, where only footing locations and controlled runoff diversions shall be created that disturb the soil. All other areas of ground cover or in-place stumps and roots shall remain in place. (Note: Tracked vehicles disturb surface layer of the ground due to size and function.) Some disking of the right-of-way may occur for proper seedbed preparation.

   Unless ponding previously occurred (i.e., existing low-lying areas), water should not be allowed to pond on the structure sites except around foundation holes; the water must

be directed away from the site in as dispersed a manner as possible. At tower or structure sites, some means of upslope interruption of potential overland flow and diversion around the footings should be provided as the first step in construction-site preparation. If leveling is necessary, it must be implemented by means that provide for continuous gentle, controlled, overland flow or percolation. A good grass cover, straw, gravel, or other protection of the surface must be maintained. Steps taken to prevent increases in the moisture content of the in-situ soils will be beneficial both during construction and over the service life of any structure.

5. Sanitation - A designated TVA or contractor representative shall contact a sanitary contractor who will provide sanitary chemical toilets convenient to all principal points of operation for every working party. The facilities shall comply with applicable federal, state, or local health laws and regulations. They shall not be located closer than 100 feet to any stream or tributary or to any wetland. The facilities shall be required to have proper servicing and maintenance, and the waste disposal contractor shall verify in writing that the waste disposal will be in state-approved facilities. Employees shall be notified of sanitation regulations and shall be required to use the toilet facilities.

6. Refuse Disposal - Designated TVA and/or contractor personnel shall be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced by his operations and by his employees. Suitable refuse collecting facilities will be required. Only state-approved disposal areas shall be used. Disposal containers such as dumpsters or roll-off containers shall be obtained from a proper waste disposal contractor. Solid, special, construction/demolition, and hazardous wastes as well as scrap are part of the potential refuse generated and must be properly managed with emphasis on reuse, recycle, or possible give away, as appropriate, before they are handled as waste. Contractors must meet similar provisions on any project contracted by TVA.

7. Landscape Preservation - TVA and its contractors shall exercise care to preserve the natural landscape in the entire construction area as well as use areas, in or outside the right-of-way, and on or adjacent to access roads. Construction operations shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural vegetation and surroundings in the vicinity of the work.

8. Sensitive Areas Preservation - Certain areas on site and along the right-of-way may be designated by the specifications or the TVA engineer as environmentally sensitive. These areas include but are not limited to areas classified as erodible, geologically sensitive, scenic, historical, and archaeological, fish and wildlife refuges, water supply watersheds, and public recreational areas such as parks and monuments. Contractors and TVA construction crews shall take all necessary actions to avoid adverse impacts to these sensitive areas and their adjacent buffer zones. These actions may include suspension of work or change of operations during periods of rain or heavy public use; hours may be restricted or concentrations of noisy equipment may have to be dispersed. If prehistoric or historic artifacts or features are encountered during clearing or construction operations, the operations shall immediately cease for at least 100 feet in each direction, and TVA's right-of-way inspector or construction superintendent and Cultural Resources Program shall be notified. The site shall be left as found until a significance determination is made. Work may continue elsewhere beyond the 100-foot perimeter.

9. Water Quality Control - TVA and contractor construction activities shall be performed by methods that will prevent entrance or accidental spillage of solid matter, contaminants, debris, and other objectionable pollutants and wastes into flowing caves, sinkholes, streams, dry watercourses, lakes, ponds, and underground water sources.

   The clearing contractor will erect and (when TVA or contract construction personnel are unable) maintain Best Management Practices (BMPs) such as silt fences on steep slopes and adjacent to any stream, wetland, or other water body. Additional BMPs may be required for areas of disturbance created by construction activities. BMPs will be inspected by the TVA field engineer or other designated TVA or contractor personnel routinely and during periods of high runoff, and any necessary repairs will be made as soon as practicable. BMP inspections will be conducted in accordance with permit requirements. Records of all inspections will be maintained on site, and copies of inspection forms will be forwarded to the TVA construction environmental engineer.

   Acceptable measures for disposal of waste oil from vehicles and equipment shall be followed. No waste oil shall be disposed of within the right-of-way, on a construction site, or on access roads.

10. Turbidity and Blocking of Streams - Construction activities in or near SMZs or other bodies of water shall be controlled to prevent the water turbidity from exceeding state or local water quality standards for that stream. All conditions of a general storm water permit, aquatic resource alteration permit, or a site-specific permit shall be met including monitoring of turbidity in receiving streams and/or storm water discharges and implementation of appropriate erosion and sediment control measures.

    Appropriate drainage facilities for temporary construction activities interrupting natural site drainage shall be provided to avoid erosion. Watercourses shall not be blocked or diverted unless required by the specifications or the TVA engineer. Diversions shall be made in accordance with TVA's "A Guide for Environmental Protection and Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities."

    Mechanized equipment shall not be operated in flowing water except when approved and, then, only to construct crossings or to perform required construction under direct guidance of TVA. Construction of stream fords or other crossings will only be permitted at approved locations and to current TVA construction access road standards. Material shall not be deposited in watercourses or within stream bank areas where it could be washed away by high stream flows. Appropriate U.S. Army Corps of Engineers and state permits shall be obtained.

    Wastewater from construction or dewatering operations shall be controlled to prevent excessive erosion or turbidity in a stream, wetland, lake, or pond. Any work or placing of equipment within a flowing or dry watercourse requires the prior approval of TVA.

11. Clearing - No construction activities may clear additional site or right-of-way vegetation or disturb remaining retained vegetation, stumps, or regrowth at locations other than the structure sites and conductor setup areas. TVA and the construction contractor(s) must provide appropriate erosion or sediment controls for areas they have disturbed that have previously been restabilized after clearing operations. Control measures shall be implemented as soon as practicable after disturbance in accordance with applicable federal, state, and/or local storm water regulations.

12. Restoration of Site - All construction disturbed areas, with the exception of farmland under cultivation and any other areas as may be designated by TVA's specifications, shall be stabilized in the following manner unless the property owner and TVA's engineer specify a different method:

    A. The subsoil shall be loosened to a minimum depth of 6 inches if possible and worked to remove unnatural ridges and depressions.

    B. If needed, appropriate soil amendments will be added.

    C. All disturbed areas will initially be seeded with a temporary ground cover such as winter wheat, rye, or millet, depending on the season. Perennials may also be planted during initial seeding if proper growing conditions exist. Final restoration and final seeding will be performed as line construction is completed. Final seeding will consist of permanent perennial grasses such as those outlined in TVA's "A Guide for Environmental Protection and Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities." Exceptions would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor.

    D. TVA holds the option, depending upon the time of year and weather condition, to delay or withdraw the requirement of seeding until more favorable planting conditions are certain. In the meantime, other stabilization techniques must be applied.

13. Air Quality Control - Construction crews shall take appropriate actions to minimize the amount of air pollution created by their construction operations. All operations must be conducted in a manner that avoids creating a nuisance and prevents damage to lands, crops, dwellings, or persons.

14. Burning - Before conducting any open burning operations, the contractor shall obtain permits or provide notifications as required to state forestry offices and/or local fire departments. Burning operations must comply with the requirements of state and local air pollution control and fire authorities and will only be allowed in approved locations and during appropriate hours and weather conditions. If weather conditions such as wind direction or speed change rapidly, the contractor's burning operations may be temporarily stopped by the TVA field engineer. The debris for burning shall be piled and shall be kept as clean and as dry as possible, then burned in such a manner as to reduce smoke. No materials other than dry wood shall be open burned. The ash and debris shall be buried away from streams or other water sources and shall be in areas coordinated with the property owner.

15. Dust and Mud Control - Construction activities shall be conducted to minimize the creation of dust. This may require limitations as to types of equipment, allowable speeds, and routes utilized. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used subject to TVA's approval. On new construction sites and easements, the last 100 feet before an access road approaches a county road or highway shall be graveled to prevent transfer of mud onto the public road.

16. Vehicle Exhaust Emissions - TVA and/or the contractors shall maintain and operate equipment to limit vehicle exhaust emissions. Equipment and vehicles that show

excessive emissions of exhaust gasses and particulates due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective repairs or adjustments are made.

17. Vehicle Servicing - Routine maintenance of personal vehicles will not be performed on the right-of-way. However, if emergency or “have to” situations arise, minimal/temporary maintenance to personal vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Heavy equipment will be serviced on the right-of-way except in designated sensitive areas. The Heavy Equipment Department within TVA or the construction contractor will properly maintain these vehicles with approved spill prevention controls and countermeasures. If emergency maintenance in a sensitive or questionable area arises, the area environmental coordinator or construction environmental engineer will be consulted. All wastes and used oils will be properly recovered, handled, and disposed/recycled. Equipment shall not be temporarily stored in stream floodplains, whether overnight or on weekends or holidays.

18. Smoke and Odors - TVA and/or the contractors shall properly store and handle combustible material that could create objectionable smoke, odors, or fumes. The contractor shall not burn refuse such as trash, rags, tires, plastics, or other debris.

19. Noise Control - TVA and/or the contractor shall take measures to avoid the creation of noise levels that are considered nuisances, safety, or health hazards. Critical areas including but not limited to residential areas, parks, public use areas, and some ranching operations will require special considerations. TVA's criteria for determining corrective measures shall be determined by comparing the noise level of the construction operation to the background noise levels. In addition, especially noisy equipment such as helicopters, pile drivers, air hammers, chippers, chain saws, or areas for machine shops, staging, assembly, or blasting may require corrective actions when required by TVA.

20. Noise Suppression - All internal combustion engines shall be properly equipped with mufflers as required by the Department of Labor's "Safety and Health Regulations for Construction." TVA may require spark arresters in addition to mufflers on some engines. Air compressors and other noisy equipment may require sound-reducing enclosures in some circumstances.

21. Damages - The movement of construction crews and equipment shall be conducted in a manner that causes as little intrusion and damage as possible to crops, orchards, woods, wetlands, and other property features and vegetation. The contractor will be responsible for erosion damage caused by his actions and especially for creating conditions that would threaten the stability of the right-of-way or site soil, the structures, or access to either. When property owners prefer the correction of ground cover condition or soil and subsoil problems themselves, the section of the contract dealing with damages will apply.

Revision July 2003

Page intentionally blank

APPENDIX IV – TENNESSEE VALLEY AUTHORITY TRANSMISSION CONSTRUCTION GUIDELINES NEAR STREAMS

Page intentionally blank

APPENDIX IV – TENNESSEE VALLEY AUTHORITY TRANSMISSION CONSTRUCTION GUIDELINES NEAR STREAMS

Even the most carefully designed transmission line project eventually will affect one or more creeks, rivers, or other type of water body. These streams and other water areas are protected by state and federal law, generally support some amount of fishing and recreation, and, occasionally, are homes for important and/or endangered species. These habitats occur in the stream and on strips of land along both sides (the streamside management zone [SMZ]) where disturbance of the water, land, or vegetation could have an adverse effect on the water or stream life. The following guidelines have been prepared to help Tennessee Valley Authority (TVA) Transmission Construction staff and their contractors avoid impacts to streams and stream life as they work in and near SMZs. These guidelines expand on information presented in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities."

Three Levels of Protection

During the preconstruction review of a proposed transmission line, TVA Resource Stewardship staff will have studied each possible stream impact site and will have identified it as falling into one of three categories: (A) standard stream protection, (B) protection of important permanent streams, or C) protection of unique habitats. These category designations are based on the variety of species and habitats that exist in the stream as well as state and federal requirements to avoid harming certain species. The category designation for each site will be marked on the plan and profile sheets. Construction crews are required to protect streams and other identified water habitats using the following pertinent set(s) of guidelines:

(A) Standard Stream Protection

This is the standard (basic) level of protection for streams and the habitats around them. The purpose of the following guidelines is to minimize the amount and length of disturbance to the water bodies without causing adverse impacts on the construction work.

Guidelines:

1. All construction work around streams will be done using pertinent Best Management Practices (BMPs) such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, Standards and Specifications.

2. All equipment crossings of streams must comply with appropriate state permitting requirements. Crossings of all drainage channels, intermittent streams, and permanent streams must be done in ways that avoid erosion problems and long-term changes in water flow. Crossings of any permanent streams must allow for natural movement of fish and other aquatic life.

3. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The method will be selected based on site-specific conditions and topography to minimize soil disturbance

and impacts to the SMZ and surrounding area. Stumps can be cut close to ground level but must not be removed or uprooted.

4. Other vegetation near streams must be disturbed as little as possible during construction. Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. Shorelines that have to be disturbed must be stabilized as soon as feasible.

(B) Protection of Important Permanent Streams

This category will be used when there is one or more specific reason(s) why a permanent (always-flowing) stream requires protection beyond that provided by standard BMPs. Reasons for requiring this additional protection include the presence of important sports fish (trout, for example) and habitats for federal endangered species. The purpose of the following guidelines is to minimize the disturbance of the banks and water in the flowing stream(s) where this level of protection is required.

Guidelines:

1. Except as modified by guidelines 2-4 below, all construction work around streams will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, Standards and Specifications.

2. All equipment crossings of streams must comply with appropriate state (and, at times, federal) permitting requirements. Crossings of drainage channels and intermittent streams must be done in ways that avoid erosion problems and long-term changes in water flow. Proposed crossings of permanent streams must be discussed in advance with Resource Stewardship staff and may require an on-site planning session before any work begins. The purpose of these discussions will be to minimize the number of crossings and their impact on the important resources in the streams.

3. Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The method will be selected based on site-specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. Cutting of trees near permanent streams must be limited to those required to meet National Electric Safety Code and danger tree requirements. Stumps can be cut close to ground level but must not be removed or uprooted.

4. Other vegetation near streams must be disturbed as little as possible during construction. Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. Shorelines that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible.

(C) Protection of Unique Habitats

This category will be used when, for one or more specific reasons, a temporary or permanent aquatic habitat requires special protection. This relatively uncommon level of protection will be appropriate and required when a unique habitat (for example, a particular spring run) or protected species (for example, one that breeds in a wet-weather ditch) is known to occur on or adjacent to the construction corridor. The purpose of the following guidelines is to avoid or minimize any disturbance of the unique aquatic habitat.

Guidelines:

1. Except as modified by Guidelines 2-4 below, all construction work around the unique habitat will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, Standards and Specifications.

2. All construction activity in and within 30 meters (100 feet) of the unique habitat must be approved in advance by Resource Stewardship staff, preferably as a result of an on-site planning session. The purpose of this review and approval will be to minimize impacts on the unique habitat. All crossings of streams also must comply with appropriate state (and, at times, federal) permitting requirements.

3. Cutting of trees within 30 meters (100 feet) of the unique habitat must be discussed in advance with Resource Stewardship staff, preferably during the on-site planning session. Cutting of trees near the unique habitat must be kept to an absolute minimum. Stumps must not be removed, uprooted, or cut shorter than 0.30 meter (1 foot) above the ground line.

4. Other vegetation near the unique habitat must be disturbed as little as possible during construction. The soil must not be disturbed by plowing, disking, blading, or grading. Areas that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible, in some cases with specific kinds of native plants. These and other vegetative requirements will be coordinated with Resource Stewardship staff.

Additional Help

If you have questions about the purpose or application of these guidelines, please contact your supervisor or the environmental coordinator in the local Transmission Service Center.

Revision July 2003

Comparison of Guidelines Under the Three Stream and Waterbody Protection Categories (page 1)

Guidelines	A: Standard	B: Important Permanent Streams	C: Unique Water Habitats
1. Reference	• All TVA construction work around streams will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, BMP Standards and Specifications.	Except as modified by guidelines 2-4 below, all construction work around streams will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, BMP Standards and Specifications.	• Except as modified by guidelines 2-4 below, all construction work around the unique habitat will be done using pertinent BMPs such as those described in "A Guide for Environmental Protection and Best Management Practices for TVA Construction and Maintenance Activities," especially Chapter 6, BMP Standards and Specifications.
2. Equipment Crossings	• All crossings of streams must comply with appropriate state and federal permitting requirements. • Crossings of all drainage channels, intermittent streams, and permanent streams must be done in ways that avoid erosion problems and long-term changes in water flow. • Crossings of any permanent streams must allow for natural movement of fish and other aquatic life.	• All crossings of streams must comply with appropriate state and federal permitting requirements. • Crossings of drainage channels and intermittent streams must be done in ways that avoid erosion problems and long-term changes in water flow. • Proposed crossings of permanent streams must be discussed in advance with Resource Stewardship staff and may require an on-site planning session before any work begins. The purpose of these discussions will be to minimize the number of crossings and their impact on the important resources in the streams.	• All crossings of streams also must comply with appropriate state and federal permitting requirements. • All construction activity in and within 30 meters (100 feet) of the unique habitat must be approved in advance by Resource Stewardship staff, preferably as a result of an on-site planning session. The purpose of this review and approval will be to minimize impacts on the unique habitat.

Comparison of Guidelines Under the Three Stream and Waterbody Protection Categories (page 2)

Guidelines	A: Standard	B: Important Permanent Streams	C: Unique Water Habitats
3. Cutting Trees	• Cutting of trees within SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The method will be selected based on site-specific conditions and topography to minimize soil disturbance and impacts to the SMZ and surrounding area. • Stumps can be cut close to ground level but must not be removed or uprooted.	• Cutting of trees with SMZs must be accomplished by using either hand-held equipment or other appropriate clearing equipment (e.g., a feller-buncher) that would result in minimal soil disturbance and damage to low-lying vegetation. The method will be selected based on site-specific conditions and topography to minimize soil disturbance an impacts to the SMZ and surrounding area. • Cutting of trees near permanent streams must be limited to those meeting National Electric Safety Code and danger tree requirements. • Stumps can be cut close to ground level but must not be removed or uprooted.	• Cutting of trees within 30 meters (100 feet) of the unique habitat must be discussed in advance with Resource Stewardship staff, preferably during the on-site planning session. Cutting of trees near the unique habitat must be kept to an absolute minimum. • Stumps must not be removed, uprooted, or cut shorter than one foot above the ground line.
4. Other Vegetation	• Other vegetation near streams must be disturbed as little as possible during construction. • Soil displacement by the actions of plowing, disking, blading or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. • Shorelines that have to be disturbed must be stabilized as soon as feasible.	• Other vegetation near streams must be disturbed as little as possible during construction. • Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will not be allowed in SMZs; however, a minimal amount of soil disturbance may occur as a result of clearing operations. • Shorelines that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible.	• Other vegetation near the unique habitat must be disturbed as little as possible during construction. • The soil must not be disturbed by plowing, disking, blading, or grading. • Areas that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible, in some cases with specific kinds of native plants. These and other vegetative requirements will be coordinated with Resource Stewardship staff

Page intentionally blank

APPENDIX V – TENNESSEE VALLEY AUTHORITY RIGHT-OF-WAY VEGETATION MANAGEMENT

Page intentionally blank

APPENDIX V – TENNESSEE VALLEY AUTHORITY RIGHT-OF-WAY VEGETATION MANAGEMENT

Tennessee Valley Authority (TVA) must manage its rights-of-way and easements to ensure emergency maintenance access and routine access to structures, switches, conductors, and communications equipment. In addition, TVA must ensure National Electrical Safety Code electrical clearances between tall-growing vegetation and any other structures. Trees located off right-of-way trees that could fall or be cut into a transmission line are also very important.

These requirements are imperative to the maintenance of the transmission system and, in some cases, underbuilt distribution lines. It is seldom understood by customers or the general public that electricity must continuously be produced and transmitted on an instant-to-instant basis to serve the demand placed on the system by continuously changing electrical load. When a switch is turned on, electricity must flow instantaneously. With increasingly complex and diverse electronic equipment controlled by computers, microchips, and other systems that respond to microsecond interruptions, any disturbance on transmission or distribution lines instantaneously affects the overall reliability of critical devices, especially production devices; security systems; process controls; medical devices; water purification and sewage treatment systems; fire and safety protection systems; communication and control systems; etc. These systems have little tolerance of even a few microseconds of interruption.

Each year, TVA must assess the conditions of the vegetation on and along its rights-of-way. This is accomplished by aerial inspections of each line, periodic walking inspections, information from aerial photographs, information from TVA field personnel, property owners, and the general public. Information is developed regarding vegetation species present, the mix of species, the observed growth, the seasonal growing conditions, and the density of the tall vegetation. TVA also evaluates the proximity, height, and growth rate of trees that may be adjacent to the right-of-way and that may be a danger to the line or structures. TVA right-of-way program administrators develop a vegetation-reclearing plan that is specific to each line segment; it is based on terrain conditions, species mix, growth, and density. They evaluate accessibility, right-of-way, and adjacent sensitive areas, land use and development, and a series of additional parameters. To the maximum extent possible, line segments from substation busbar to substation busbar should be recleared in the same year so a line can be made as reliable as reasonably possible.

Complicating factors are the rich diversity of tall-growing and climbing vegetation species in the power service area. The long growing season with abundant rain greatly accelerates growth in the moderate to rich soils of the TVA power service area. In addition, many rapid growing species are accelerated growers when competing vegetation is removed or reduced. Diverse geographic features, slopes, and conditions along line easements create many sensitive environmental and public interest areas on or adjacent to rights-of-way.

For the above reasons, TVA uses an integrated vegetation management approach. In farming areas of right-of-way crops and pasture, TVA encourages property owner management of the right-of-way using low-growing crops year after year. In dissected terrain with rolling hills and interspersed woodlands traversed by the rights-of-way, TVA uses mechanical mowing to a large extent.

When slopes become hazardous to farm tractors and rotary mowers, TVA may use a variety of herbicides specific to the species present with a variety of possible application techniques. When scattered small segments of tall-growing vegetation are present but accessibility along the right-of-way is difficult or the path to such segments is very long compared to the amount present, herbicides may be used.

In very steep terrain, in sensitive environmental areas, in extensive wetlands, at stream banks, and in sensitive property owner land use areas, hand clearing may be utilized. Hand clearing is recognized as one of the most hazardous occupations documented by the Occupational Health and Safety Administration. For that reason, TVA is actively looking at better control methods including use of low-volume herbicide applications, occasional singletree injections, and tree-growth regulators.

TVA does not encourage individual property owner tree reclearing activity because of the high hazard potential of hand clearing, possible interruptions of the line, and electrical safety considerations for untrained personnel that might do the work. Private property owners may reclear the right-of-way with trained reclearing professionals.

TVA's experience initially was completely with hand clearing. World War II manpower shortages forced TVA to look toward developments in herbicide research. An era of near exclusive use of herbicides existed. Then, because of the discovery of residue accumulations with many pesticides and price increases of herbicides, high-volume applications lost favor, and TVA sought other modes of vegetation control. Farm equipment of greater power and efficiency allowed use of tractor-mounted rotary mowers. These mowers not only cut the tall saplings and seedlings on the right-of-way, they shatter the stump and the supporting near-surface root crown. The tendency of resistant species is to resprout from the root crown, and shattered stumps produce a multistem dense stand in the immediate area. Repeated use of the mowers on short-cycle reclearing with many original stumps regrowing in the above manner creates a single-species thicket or monoculture. With the original large root system and multiple stems, the resistant species can and usually do produce regrowth at the rate of 5-10 feet in a year. In years with high rainfall, the growth can reach 12-15 feet in a single year.

These created, dense, monoculture stands can become nearly impenetrable for even large tractors. Such stands have low diversity, little wildlife food, or nesting potential, and become a property owner concern. They tend to spread off the right-of-way into more desirable species areas. Increasingly, TVA is receiving complaints about the shatter sapling debris density. The potential exists for insect invasion or fungus infection resulting from the easy invasion of damaged specimens or debris. Once started, such infestations or invasions can spread into valuable timber of the same or related species off the right-of-way.

Therefore, TVA has been working with universities (such as Mississippi State University, University of Tennessee, Purdue University, and others), chemical companies, other utilities, and personnel of the U.S. Department of Transportation, U.S. Fish and Wildlife Service, and U.S. Forest Service to explore other means of dealing with problem vegetation. The results have been strong recommendations to use species-specific, low-volume herbicide applications in more situations. Research, demonstrations, and other right-of-way programs show a definite improvement of rights-of-way treated with selective low-volume applications of new herbicides using a variety of application techniques and timing.

The above-named universities strongly recommend low-volume herbicide applications since their research demonstrates much wider plant diversity after such applications. They report better ground erosion protection and the development of more wildlife food plants and cover plants. In most situations, there is increased development of wild flowering plants and shrubs. In conjunction with herbicides, the diversity and density of low-growing plants provide control of tall-growing species through competition.

Wildlife managers are specifically requesting the use of herbicides in place of rotary mowing in order to avoid damage to nesting and tunneling wildlife. This method retains groundcover year-round with a better mix of food species and associated high-protein insect populations for birds in the right seasons. Most also report less damage to soils (even when compared with rubber-tired equipment).

Property owners interested in tree production are requesting use of low-volume applications rather than hand or mechanical clearing because of the insect and fungus problems in damaged vegetation and debris left on rights-of-way. The insect and fungus invasions such as pine tip moth, oak leaf blight, sycamore and dogwood blight, etc., are becoming widespread across the nation.

Some property owners have special interests. In those cases, TVA attempts to work with them to either have them sign agreements in which they maintain the right-of-way in right-of-way crops or pasture or they do the actual right-of-way maintenance. Some may choose to use low-growing trees or fruit trees, sod, vegetable crops, or other low vegetation types.

TVA discusses with property owners the potential to sign an agreement to manage their land for wildlife under the auspices of "Project Habitat," a joint TVA/American Cyanamid wildlife organization. The property owner maintains the right-of-way in wildlife food and cover with emphasis on quail, turkey, deer, or related forms. A variation used in or adjacent to developing suburban areas is to sign agreements with the developer and residents to plant and maintain wildflowers on the right-of-way.

TVA places strong emphasis on developing rights-of-way in the above manner. When the property owners do not agree to these opportunities, TVA must maintain the right-of-way in the most environmentally acceptable, cost and vegetation effective and efficient manner possible.

Approved Herbicides for Usage on TVA Rights-of-Way

Trade Name	Active Ingredients	Label Signal Word
Accord	Glyphosate/Liquid	Caution
Arsenal	Imazapyr/Liquid/Granule	Caution
Escort	Metsulfuron Methyl/dry flowable	Caution
Garlon	Triclopyr/Liquid	Caution
Garlon 3A	Triclopyr/Liquid	Danger
Diuron	Diuron/Flowable powder	Caution
Spike 40P	Tebuthiuron/Pellet	Caution
Spike 80W	Tebuthiuron/Wettable powder	Caution
Transline	Clopyralid/Liquid	Caution
Pathfinder II	Triclopyr/RTU	Caution
Krenite UT	Fosamine Ammonium	Warning
Vanquish	Diglycolamine	Caution

Approved Herbicides for Bare Ground Areas

Trade Name	Active Ingredients	Label Signal Word
Chopper	Imazapyr/RTU	Caution
Topsite	Diuron/Imazapyr	Caution
Roundup	Glyphosate/Liquid	Caution
SpraKil SK-26	Tebuthiuron and Diuron	Caution
Sahara	Diuron/Imazapyr	Caution
Roundup Pro	Glyphosate	Caution
Endurance	Prodiamine	Caution
Predict	Norflurazon	Caution

Tree growth regulators (TGRs) are being considered for use on tall trees that have special circumstances where they must be trimmed on a regular cycle.

Approved TGRs for Use on TVA Property

Trade Name	Active Ingredients	Label Signal Word
TGR	Flurprimidol	Caution
Profile 2SC	TGR-paclobutrazol	Caution

The herbicide Pathway is being considered for use following initial clearing. Test plots have been established to determine the effectiveness of Pathway. Pathway is a mix of Picloram and 2,4-D and carries a "Warning" signal word.

These herbicides have been evaluated in extensive studies at universities in support of registration applications and label requirements. Most have been reviewed in the U.S. Forest Service (USFS) Vegetation Management Environmental Impact Statements (EISs), and those evaluations are incorporated here by reference. The result of these reviews has been a consistent finding of limited environmental impact beyond that of control of the target vegetation. All the listed herbicides have been found to be of low-environmental toxicity to resources (including buffer zones for listed threatened or endangered species) when applied by trained applicators following the label and registration procedures.

Those not addressed in the USFS EISs or their supporting research have been peer reviewed in university research, addressed in U.S. Environmental Protection Agency (USEPA) literature reviews, or are discussed in documents on file at USEPA and U.S. Fish and Wildlife Service libraries. On the basis of this literature and TVA's reviews, the approved list above has been compiled and is reviewed again each year as new information is published.

The rates of application utilized are those listed on the USEPA-approved label and consistent with the revised application rates of the USFS Vegetation Management EIS Record of Decision. These typical application rates, in pounds/acre of active ingredient, are as follows:

Herbicide	Application Method					
	Aerial Liquid	Aerial Granule	Mechanical Liquid	Mechanical Granule	Manual Hand	Manual Foliar
2,4-D amine	2.0		2.5			2.0
2.4-D ester	2.5		4.0			2.0
2.4-DP	3.0		4.0			1.0
Dicamba			2.0			2.0
Krenite	6.0		7.8			
Glyphosate	1.5		1.5			1.0
Hexazinone	4.0	4.0	4.0	4.0	4.0	4.0
Imazapyr	0.75		0.75			0.75
Fuel oil	0.5		2.0			1.5
Limonene	0.9		0.9			0.9
Picloram	0.5		0.7			0.4
Sulfomet	0.13		0.17			0.06
Tebuthiuron	1.0	1.0	1.0	1.0		4.0
Triclopyr amine	4.0		4.0			4.0
Triclopyr ester	4.0		4.0			4.0

TVA currently uses primarily low-volume applications of foliar and basal applications of Accord (Glyphosate) and Accord (Glyphosate)-Arsenal (Imazapyr) tank mixes. Glyphosate is one of the most widely used herbicidal active ingredients in the world and has been continuously the subject of numerous exhaustive studies and scrutiny to determine its potential impacts on humans, animals, and the environment.

Accord, labeled for vegetation management in forestry and utility rights-of-way applications, has a full aquatics label and can be applied to emergent weeds in all bodies of fresh and brackish water. There is no restriction on the use of treated water for irrigation, recreation, or domestic purposes.

Accord is applied to the foliage of actively growing plants. The active ingredient is absorbed through the leaves and rapidly moves throughout the plant. Glyphosate prevents the plant from producing amino acids that are unique to plants and are building blocks of plant proteins. The plant, unable to make proteins, stops growing and dies.

The favorable environmental fate characteristic of Accord herbicide and its major metabolite (breakdown product) aminomethylphosphonic acid (AMPA) is well known. Continuing research is underway with more than 400 studies conducted to date in the laboratory and under field use conditions. These studies show rapid breakdown, little soil or plant debris retention, and little vertical movement into soil below the surface.

Glyphosate is naturally degraded by microbes in soil and water under both aerobic (with oxygen) and anaerobic (without oxygen) conditions. AMPA is further degraded in soil and sediments to phosphorus, nitrogen, hydrogen, and carbon dioxide. Glyphosate binds

rapidly and completely to a wide range of soils and sediment when introduced into the environment. This essentially eliminates movement in the soil. The average half-life of glyphosate in soils is less than 45 days. Half-life for the dissipation of glyphosate in environmental waters ranges from 1.5 to 14 days.

Glyphosate is nontoxic to birds, mammals, and bees and has been shown not to bioaccumulate since it acts in plants through an enzyme system that does not exist in animals or humans.

Arsenal (Imazapyr) has been similarly tested, and it is found to have low-leaching potential in soils. When available on or in the soil, it is broken down rapidly by soil microbes to naturally occurring compounds. When not available, Imazapyr is bound tightly to soil colloids and is unavailable for movement. The half-life in soil is 25 to 65 days.

Extensive chronic and acute toxicity studies have made Arsenal a USEPA-classified herbicide as practically nontoxic to humans, mammals, birds, fish, aquatic invertebrates, and insects. The chronic studies demonstrate that Imazapyr is non-teratrogenic, non-mutagenic, and not a carcinogen.

The mode of action suppresses amino acids of the plant via an enzyme system containing acetohydroxy acid synthase. This enzyme system does not exist in other forms of life including humans and animals.

Revision July 2003

APPENDIX VI – COMMON AND REPRESENTATIVE PLANT SPECIES OBSERVED ALONG THE COLUMBUS-DEKALB TAP TO PAULETTE 161-KV TRANSMISSION LINE PROJECT ROUTE

Page intentionally blank

APPENDIX VI - COMMON AND REPRESENTATIVE PLANT SPECIES OBSERVED ALONG THE COLUMBUS-DEKALB TAP TO PAULETTE 161-KV TRANSMISSION LINE PROJECT ROUTE

Common Name	Scientific Name	Plant Community[1]
Alabama Supplejack	*Berchemia scandens* (J. Hill) K. Koch	E-O, RH, S/S
American Beech	*Fagus grandifolia* Ehrh.	RH
• American Elder	*Sambucus canadensis* L.	RH, S/S
• American Hornbeam	*Carpinus caroliniana* Walt.	RH
• American Sycamore	*Platanus occidentalis* L.	RH, S/S
American Wild Carrot	*Daucus pusillus* Michx.	G
Annual Bluegrass	*Poa annua* L.	C
Bahia Grass	*Paspalum notatum* Fluegge	G
• Bermuda Grass	*Cynodon dactylon* (L.) Pers.	G
Black Cherry	*Prunus serotina* Ehrh.	RH, S/S
Black Gum	*Nyssa sylvatica* Marsh.	RH, S/S
Black Walnut	*Juglans nigra* L.	RH
• Black Willow	*Salix nigra* Marsh.	W
Box-elder	*Acer negundo* L.	RH, S/S
Brazilian Vervain	*Verbena brasiliensis* Vell.	G, S/S
Broad-leaf Cattail	*Typha latifolia* L.	RH
• Broom-sedge	*Andropogon virginicus* L.	G, S/S
Buckthorn Bumelia	*Bumelia lycioides* (L.) Pers.	E-O, RH
• Bur Oak	*Quercus macrocarpa* Michx.	E-O
Bush Aster	*Aster dumosus* L.	S/S
Bushy Bluestem	*Andropogon glomeratus* (Walt.) B.S.P.	G, S/S
Canada Goldenrod	*Solidago canadensis* L.	G, S/S
Canada Horseweed	*Conyza canadensis* (L.) Cronq.	G
Canadian Black-snakeroot	*Sanicula canadensis* L.	RH, S/S
• Carolina Basswood	*Tilia americana* L. var. *caroliniana* (Mill.) Castig.	• RH
• Carolina Buckthorn	*Rhamnus caroliniana* Walt.	E-O
• Carolina Coral-beads	*Cocculus carolinus* (L.) DC.	E-O, RH, S/S
Carolina Elephant-foot	*Elephantopus carolinianus* Raeusch.	RH, S/S
Carolina Geranium	*Geranium carolinianum* L.	C
• Carolina Wild-petunia	*Ruellia caroliniensis* (Walt.) Steud.	BH, S/S
Cat Greenbriar	*Smilax glauca* Walt.	S/S
Cherokee Sedge	*Carex cherokeensis* Schw.	E-O, RH, S/S
Cherry Bark Oak	*Quercus pagoda* Raf.	RH, S/S
Chickasaw Plum	*Prunus angustifolia* Marsh.	E-O, S/S
Chinaberrytree	*Melia azedarach* L.	G, RH, S/S
Chinese Bush Clover	*Lespedeza cuneata* (Dum. Cours.) G. Don	G, S/S
Chinese Privet	*Ligustrum sinense* Lour.	S/S
Chinkapin Oak	*Quercus muhlenbergii* Engelm.	E-O, RH, S/S
Climbing Hempweed	*Mikania scandens* (L.) Willd.	RH
• Cogongrass	*Imperata cylindrica* (L.) Beauv.	• G, SS
Common Chickweed	*Stellaria media* (L.) Villars	C
Common Greenbriar	*Smilax rotundifolia* L.	G, S/S
Common Persimmon	*Diospyrus virginiana* L.	RH, S/S
Common Pokeweed	*Phytolacca americana* L.	G, S/S
Common Selfheal	*Prunella vulgaris* L.	E-O

[1] Plant community abbreviations: C: cropland; E-O: Eastern red cedar-osage-orange; G: grasslands; RH: riparian-hardwood forests; S/S: seedling/sapling vegetation. See text for further description of each of these plant communities and the acreage occupied by each in the project area.

Appendix VI, Continued

Common Name	Scientific Name	Plant Community[1]
Common Yellow Woodsorrel	*Oxalis stricta* L.	G, S/S
• Compass Plant	*Silphium laciniatum* L.	G
Coralberry	*Symphoricarpos orbiculatus* Moench	E-O, RH
• Creeping Jennie	*Lysimachia nummularia* L.	RH
Crossvine	*Bignonia capreolata* L.	RH, S/S
Curly Dock	*Rumex crispus* L.	C, G, S/S
• Cypress-swamp Sedge	*Carex joorii* L.H. Bailey	RH
Deciduous Holly	*Ilex decidua* Walt.	E-O, RH, S/S
• Diamondflowers	*Hedyotis nigricans* (Lam.) Fosberg	G
• Dotted Smartweed	*Polygonum punctatum* Ell.	G, RH
Durand's White Oak	*Quercus durandii* Buckley	E-O, RH, S/S
Eastern Cottonwood	*Populus deltoides* W.Bartram ex Marsh.	RH, S/S
Eastern False-willow	*Baccharis halimifolia* L.	S/S
Eastern Gamagrass	*Tripsacum dactyloides* (L.) L.	G, S/S
Eastern Redbud	*Cercis canadensis* L.	E-O, RH, S/S
Eastern Red Cedar	*Juniperus virginiana* L.	E-O, RH, S/S
Ebony Spleenwort	*Asplenium platyneuron* (L.) Oakes	E-O, RH
Elliott Blueberry	*Vaccinium elliottii* Chapm.	RH
English Plantain	*Plantago lanceolata* L.	C
False Indigo-bush	*Amorpha fruticosa* L.	RH
Field Garlic	*Allium vineale* L.	G, S/S
Field Paspalum	*Paspalum laeve* Michx.	G
Flat-topped Fragrant Goldenrod	*Euthamia graminifolia* (L.) Nutt.	• G, S/S
Flowering Dogwood	*Cornus florida* L.	RH
• Frank's Sedge	*Carex frankii* Kunth	RH
Giant Cane	*Arundinaria gigantea* (Walt.) Walt. ex Muhl.	H, S/S
Grain Sorghum	*Sorghum vulgare* Pers.	C
• Green Ash	*Fraxinus pennsylvanica* Marsh.	RH, S/S
Green-flowered Milkweed	*Asclepias viridis* Walt.	G
Hairy Butter-cup	*Ranunculus sardous* Crantz	S/S
• Hardy Orange	*Poncirus trifoliata* (L.) Raf.	E-O, RH
Heart-leaf Peppervine	*Ampelopsis cordata* Michx.	RH, S/S
Hemp Sesbania	*Sesbania exaltata* (Raf.) Rydb.	C
Henbit	*Lamium amplexicaule* L.	C
Honey-locust	*Gleditsia triacanthos* L.	RH, S/S
Indian Sea-oats	*Chasmanthium latifolium* (Michx.) H. Yates	RH
Japanese Honeysuckle	*Lonicera japonica* Thunb.	RH, S/S
• Japanese Virgin's-bower	*Clematis terniflora* DC.	RH
Johnson Grass	*Sorghum halepense* (L.) Pers.	G, S/S
• Late-flowering Thoroughwort	*Eupatorium serotinum* Michx.	S/S
Lax-flower Witchgrass	*Dichanthelium laxiflorum* (Lam.) Gould	RH
Late Purple Aster	*Aster patens* Ait.	G
• Leathery Rush	*Juncus coriaceus* Mackenz.	RH, S/S
Little Bluestem	*Schizachyrium scoparium* (Michx.) Nash	G, S/S
• Loblolly Pine	*Pinus taeda* L.	P, RH, S/S
• Long-awn Muhly	*Muhlenbergia capillaris* (Lam.) Trin.	G

[1] Plant community abbreviations: C: cropland; E-O: Eastern red cedar-osage-orange; G: grasslands; RH: riparian-hardwood forests; S/S: seedling/sapling vegetation. See text for further description of each of these plant communities and the acreage occupied by each in the project area.

Appendix VI, Continued

Common Name	Scientific Name	Plant Community[1]
Long-leaf Spikegrass	*Chasmanthium sessiliflorum* (Poir.) H. Yates	RH
Long-spike Tridens	*Tridens strictus* (Nutt.) Nash	G
Lyre-leaf Sage	*Salvia lyrata* L.	G, S/S
Macartney Rose	*Rosa bracteata* J.C. Wendl.	G
Maryland Goldenaster	*Chrysopsis mariana* (L.) Ell.	G
New England Aster	*Aster novae-angliae* L.	G
Nimble-will	*Muhlenbergia schreberi* J.F.Gmel.	RH
Nutmeg Hickory	*Carya myristiciformis* (Michx.f.) Nutt.	E-O, RH, S/S
Oldfield Goldenrod	*Solidago nemoralis* Ait.	G
Osage-orange	*Maclura pomifera* (Raf.) C.R. Schneid.	E-O, RH, S/S
Overcup Oak	*Quercus lyrata* Walt.	• RH
Partridge Pea	*Cassia fasciculata* Michx.	G, S/S
Pecan	*Carya illinoensis* (Wangenh.) K. Koch	RH, S/S
• Peppervine	*Ampelopsis arborea* (L.) Koehne	RH, S/S
Philadelphia Fleabane	*Erigeron philadelphicus* L.	G, S/S
Pinkladies	*Oenothera speciosa* Nutt.	G
• Pinnate Prairie Coneflower	*Ratibida pinnata* (Vent.) Barnhart	G
Poison Ivy	*Toxicodendron radicans* (L.) Kuntze	E-O, RH, S/S
Post Oak	*Quercus stellata* Wangenh.	RH, S/S
Poverty Drop Seed	*Sporobolus vaginiflorus* (Torr. ex A. Gray) A. W. Wood	G
• Purple Lovegrass	*Eragrostis spectabilis* (Pursh) Steud.	G
• Purple-top Tridens	*Tridens flavus* (L.) A. Hitchc.	G
• Red Buckeye	*Aesculus pavia* L.	RH
Red Maple	*Acer rubrum* L.	RH, S/S
Red-top Panic Grass	*Panicum rigidulum* Bosc. ex Nees	G
• Resurrection Fern	*Pleopeltis polypodioides* (L.) E.G. Andrews & Windham	E-O, RH
Retrorse Flatsedge	*Cyperus retrorsus* Chapm.	G
Rough Cockle-bur	*Xanthium strumarium* L.	• G
Rough-leaf Dogwood	*Cornus drummondii* C.A. Meyer	E-O, RH, S/S
Rusty Blackhaw	*Viburnum rufidulum* Raf.	E-O
Sassafras	*Sassafras albidum* (Nutt.) Nees	RH
Saw Greenbrier	*Smilax bona-nox* L.	RH, S/S
Scaly Gayfeather	*Liatris squarrosa* (L.) Michx.	G
Serrate-leaf Blackberry	*Rubus argutus* Link	S/S
• Shumard Oak	*Quercus shumardii* Buckley	RH
Small Dog-fennel Thoroughwort	*Eupatorium capillifolium* (Lam.) Small	S/S
Smooth Sumac	*Rhus glabra* L.	S/S
Southern Dewberry	*Rubus trivialis* Michx.	S/S
Southern Shagbark Hickory	*Carya carolinae-septrionalis* (Ashe) Engler & Grabner	RH, S/S
• Soybean	*Glycine max* (L.) Merrill	C
• Sticky Chickweed	*Cerastium glomeratum* Thuill.	C, S/S
Stiff Goldenrod	*Solidago rigida* L.	G
Sugarberry	*Celtis laevigata* Willd.	E-O, RH, S/S

[1] Plant community abbreviations: C: cropland; E-O: Eastern red cedar-osage-orange; G: grasslands; RH: riparian-hardwood forests; S/S: seedling/sapling vegetation. See text for further description of each of these plant communities and the acreage occupied by each in the project area.

Appendix VI, Continued

Common Name	Scientific Name	Plant Community[1]
Sugar Cane Plumegrass	*Erianthus giganteus* (Walt.) F. T. Hubb. non Muhl.	S/S
Summer Grape	*Vitis aestivalis* Michx.	RH
• Swamp Chestnut Oak	*Quercus michauxii* Nutt.	RH
• Sweet Gum	*Liquidambar styraciflua* L.	RH, S/S
• Sweet Pignut Hickory	*Carya glabra* (Mill.) Sweet	RH
• Switchgrass	*Panicum virgatum* L.	• G, S/S
• Tall Fescue	*Festuca arundinacea* L.	G
• Tall Ironweed	*Vernonia gigantea* (Walt.) Trelease	S/S
Tennessee Aster	*Aster hemisphericus* E. J. Alex.	G
Texas Gourd	*Cucurbita texana* (Scheele) Gray	C
• Trumpetcreeper	*Campsis radicans* (L.) Seem.	RH, S/S
• Tuberous Vervain	*Verbena rigida* Spreng.	S/S
Vaseygrass	*Paspalum urvillei* Steud.	G, S/S
Virginia Wild-rye	*Elymus virginicus* L.	E-O, RH, S/S
Water Hickory	*Carya aquatica* (Michx. f.) Nutt.	RH
Water Oak	*Quercus nigra* L.	RH, S/S
West Indian Drop Seed	*Sporobolus indicus* (L.) R.Br.	G
• White Avens	*Geum canadense* Jacq.	RH, S/S
• White Crownbeard	*Verbesina virginica* L.	RH, S/S
• White Heath Aster	*Aster pilosus* Willd.	G
Willow Oak	*Quercus phellos* L.	RH, S/S
Winged Elm	*Ulmus alata* Michx.	RH, S/S
• Winged Sumac	*Rhus copallinum* L.	S/S
• Witchgrass	*Panicum capillare* L.	G, S/S
• Yellow Bristle Grass	*Setaria glauca* (L.) Beauv.	G, S/S
• Yellow Indiangrass	*Sorghastrum nutans* (L.) Nash	G
• Yellow Thistle	*Cirsium horridulum* Michx.	S/S

[1] Plant community abbreviations: C: cropland; E-O: Eastern red cedar-osage-orange; G: grasslands; RH: riparian-hardwood forests; S/S: seedling/sapling vegetation. See text for further description of each of these plant communities and the acreage occupied by each in the project area.

APPENDIX VII – WETLAND DATA FORMS

Page intentionally blank

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Columbus-DeKalb Transmission Line – Macon, Mississippi	Date:	11 March and 14 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PSS1
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Fraxinus pennsylvanica	Sapling	Facw	Carex amphibola v. corrugata	Herb	Facw
Celtis laevigata	Sapling	Facw	Carex cherokeensis	Herb	Facw-
Toxidodendron radicans	Vine/Herb	Fac	Carex festucacea	Herb	Facw
Carex hyalinolepis	Herb	Obl	Senecio glabellus	Herb	Facw+
Carex granularis	Herb	Facw	Ranunculus sardous	Herb	Fac+
Carex oxylepis	Herb	Facw-	Valerianella radiata	Herb	Fac-
Carex vulpinoidea	Herb	Obl			
Carex brevior	Herb	Obl			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 93%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: 0-1 (in.)
- Depth to Free Water in Pit: ____ (in.)
- Depth to Saturated Soil: 0 (in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

- ____ Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Leeper silty clay	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Vertic Haplaquept	Field Observations Confirm Mapped Type?	Yes	x	No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-8	A	10YR 4/1	10YR 4/2	10%	Clay
8-10+	B	10YR 5/3	10YR 5/6	10%	Clay
			10YR 4/2	5%	

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions	x	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Leeper silty clay is associated with Griffith, Catalpa, and Marietta soils. All four of these soils are on the national and state hydric soils lists for hydric inclusions.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Wetland W1 is a scrub-shrub wetland dominated by Fraxinus pennsylvanica and Celtis laevigata on regenerating, former, agricultural fields (e.g., pastures) in the east floodplain of Tibby Creek.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PSS1
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W2A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Fraxinus pennsylvanica	Shrub	Facw	Carex vulpinoidea	Herb	Obl
Ranunculus sardous	Herb	Fac+	Juncus sp.	Herb	
Carex granularis	Herb	Facw			
Carex festucacea	Herb	Facw			
Valerianella radiata	Herb	Fac-			
Rhexia mariana	Herb	Facw+			
Eupatorium serotinum	Herb	Fac			
Carex cherokeensis	Herb	Facw-			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 80%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: ____ (in.)
- Depth to Free Water in Pit: ____ (in.)
- Depth to Saturated Soil: ____ (in.)

Remarks: This location was documented on April 16th, 2003. During a March 11th, 2003, field survey standing water to depths of 1 to 3 inches was observed in this area. This area is adjacent to a manmade pond and drains west into wetland W2, of which it is a part.

Wetland Hydrology Indicators:

Primary Indicators:

- ____ Inundated
- ____ Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Brooksville silty clay, 1-3% slopes	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Aquic Chromudert	Field Observations Confirm Mapped Type?	Yes	No	x

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	10YR 3/1			Loamy clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: The ground surface, and possibly site hydrology, has been altered by construction of two man-made ponds in the field immediately east of the wetland W2A area.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Primary hydrologic indicators were not evident on the April 15th field survey. However, presence of wetland hydrology is based on the primary hydrologic indicators present on March 1, which included surface water 0-3 inches in depth and saturation in the upper 12 inches.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way			Date:	11 March and 16 March 2003
Applicant/Owner:	TVA			County:	Noxubee
Investigator:	B. Rosensteel, P. Durr			State:	MS
Do normal circumstances exist on the site?	Yes x	No		Community ID:	PFO1
Is the site significantly disturbed (Atypical Situation)?	Yes	No x		Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes	No x		Plot ID:	W2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Celtis laevigata	Canopy/Shrub	Facw	Carex oxylepis	Herb	Facw-
Fraxinus pennsylvanica	Canopy/Shrub	Facw	Carex granularis	Herb	Facw
Acer rubrum	Shrub	Fac	Carex cherokeensis	Herb	Facw-
Berchemia scandens	Vine	Facw-			
Cornus foemina	Shrub	Facw-			
Myosotis verna	Herb	Fac-			
Chasmanthium latifolium	Herb	Fac-			
Poa sylvestris	Herb	Fac+			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 82%

Remarks: This is a young forest dominated by sugarberry and green ash. It is in a small area flanked by upland field to the west, upland old field and a large manmade pond to the south, upland old field to the north, and wetland W2A and manmade ponds to the east.

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: 0-2 (in.)
- Depth to Free Water in Pit: 1 (in.)
- Depth to Saturated Soil: 0 (in.)

Remarks: The hydrology of this area may have been altered as a result of the construction of man-made ponds to the south and east.

Wetland Hydrology Indicators:

Primary Indicators:

- ____ Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- x Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Vaiden silty clay, 0-2 slopes, and Demopolis-Binnville complex, 2-8% slopes, eroded	Drainage Class:	Somewhat poorly drained Well-drained		
Taxonomy (Subgroup):	Vertic Hapludulf Typic Udorthent/Typic Rendoll	Field Observations Confirm Mapped Type?	Yes	No	x

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	N 4/1			Silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: The mapped soil series and soils associated with it are not listed as hydric soils. The hydrology of this area may have been altered by the construction of ponds to the south and the east, which may have contributed to the development of hydric soil.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Area of forested wetland in a small-forested area flanked by fields. The hydrology may have been altered by construction of ponds to the east and south.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus Dekalb Transmission Line ROW	Date:	11 March and 16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS

Do normal circumstances exist on the site?	Yes	x	No		Community ID: PFO1
Is the site significantly disturbed (Atypical Situation)?	Yes		No	x	Transect ID:
Is the area a potential problem area? (If needed, explain on reverse)	Yes		No	x	Plot ID: W3A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Celtis laevigata	Canopy/Sapling	Facw	Cardamine bulbosa	Herb	Obl
Liquidambar styriciflua	Sapling	Fac			
Quercus phellos	Canopy/Shrub	Facw-			
Fraxinus pennsylvanica	Sapling/Shrub	Facw			
Ilex deciduas	Shrub	Facw-			
Cornus foemina	Shrub	Facw-			
Smilax rotundifolia	Vine	Fac			
Berchemia scandens	Vine	Facw			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: .

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water:	0-2	(in.)
Depth to Free Water in Pit:	3	(in.)
Depth to Saturated Soil:	0	(in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

- x Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Vaiden silty clay	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Vertic Hapludulf	Field Observations Confirm Mapped Type?	Yes (see remarks)	No	

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	N 4/1	7.5YR 4/6	1%	Silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Soil profile similar to description for Brooksville silty clay, with which the Vaiden Series is associated.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Wetland W3A is in a remnant forested flatwoods area between an open field to the west and a regenerating clearcut (also flatwoods area) containing wetlands 3B, 3C, and 3D to the east

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PSS1
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W3B-C-D

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Celtis laevigata	Sapling/Shrub	Facw	Cornus foemina	Shrub	Facw-
Quercus phellos	Canopy/Sapling	Facw-	Lonicera japonica	Vine	Fac-
Fraxinus pennsylvanica	Sapling/Shrub	Facw	Toxicodendron radicans	Vine	Fac
Liquidambar styriciflua	Shrub	Fac+	Berchemia scandens	Vine	Facw-
Ulmus americana	Sapling	Facw	Cardamine bulbosa	Herb	Obl
Fraxinus americana	Sapling	Facu	Senecio glabellus	Herb	Facw+
Ulmus alata	Sapling	Facu+			
Ilex decidua	Shrub	Facw-			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water:	0-2	(in.)
Depth to Free Water in Pit:		(in.)
Depth to Saturated Soil:		(in.)

Remarks: Surface water in slightly eroded depressional drainages. During a previous site visit on March 11, 2003, the soil was saturated to the surface and there was free water at 3 inches.

Wetland Hydrology Indicators:

Primary Indicators:

- ____ Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Vaiden silty clay	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Vertic Hapludalf	Field Observations Confirm Mapped Type?	Yes	(see remarks)	No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-7	A	10YR 4/1	10YR 5/3	5%	Silty clay loam
7-10	B	N 6/1	10YR 5/3	15%	Silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Soil profile similar to description for Brooksville silty clay, with which the Vaiden Series is associated.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: W3B, W3C, and W3D are three separate depressional drainage areas in a regenerating clear-cut in a flatwoods area. This area drains to the south to Noxubee River tributaries.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way				Date:	11 March and 16 April 2003	
Applicant/Owner:	TVA				County:	Noxubee	
Investigator:	B. Rosensteel, P. Durr				State:	MS	
Do normal circumstances exist on the site?		Yes	x	No	Community ID:	PSS1	
Is the site significantly disturbed (Atypical Situation)?		Yes		No	x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)		Yes		No	x	Plot ID:	W4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Fraxinus pennsylvanica	Canopy/Sapl/ Shrub	Facw	Juncus effusus	Herb	Facw+
Platanus occidentalis	Sapling	Facw-	Andropogon glomeratus	Herb	Facw+
Quercus phellos	Canopy/Sapling	Facw-	Carex cherokeensis	Herb	Facw-
Liquidambar styriciflua	Shrub	Fac+	Valerianella radiata	Herb	Fac-
Quercus nigra	Shrub	Fac	Toxicodendron radicans	Herb	Fac
Ligustrum sinense	Shrub	Fac	Myosotis verna	Herb	Fac-
Ilex decidua	Shrub	Facw-	Carex vulpinoidea	Herb	Obl
Ranunculus sardous	Herb	Fac+	Eleocharis obtusa	Herb	Obl

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 88%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- ____ No Recorded Data Available

Field Observations:

Depth of Surface Water:	0-5	(in.)
Depth to Free Water in Pit:	1	(in.)
Depth to Saturated Soil:	0	(in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

- x Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Leeper silty clay	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Vertic Haplaquept	Field Observations Confirm Mapped Type?	Yes	x	No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-8	A	2.5Y 6/2	7.5YR 5/6	5%	Silty loam
8-10+	B	10YR 6/1	5YR 4/6	10%	Silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions	x	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Leeper silty clay is associated with Griffith, Catalpa, and Marietta soils. All four of these soils are on the national and state hydric soils lists for hydric inclusions.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Wetland W4 includes a wooded fencerow with mature hardwoods, but is primarily dominated by saplings in what may have previously been a pasture or other agricultural fields in the west floodplain of Plum Creek.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way			Date:	11 March 2003
Applicant/Owner:	TVA			County:	Noxubee
Investigator:	B. Rosensteel, P. Durr			State:	MS
Do normal circumstances exist on the site?	Yes	x	No	Community ID:	PFO1
Is the site significantly disturbed (Atypical Situation)?	Yes		No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes		No x	Plot ID:	W5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Fraxinus pennsylvanica	Canopy	Facw			
Celtis laevigata	Canopy/Sapling	Facw+			
Ligustrum sinense	Shrub	Fac			
Chasmanthium latifolium	Herb	Fac-			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 75%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: ___ (in.)
- Depth to Free Water in Pit: ___ (in.)
- Depth to Saturated Soil: ___ (in.)

Remarks: Frequently flooded terrace immediately adjacent to Plum Creek.

Wetland Hydrology Indicators:

Primary Indicators:

- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ___ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Mooreville loam, occasionally flooded	Drainage Class:	Moderately well-drained		
Taxonomy (Subgroup):	Fluvaquentic Dystrochrept	Field Observations Confirm Mapped Type?	Yes	No	x

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-8	A	N 4/			Silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Soil sample was observed in low light conditions near sunset, thus, Munsell description could vary slightly from that reported. Mooreville loam is listed on the Noxubee County hydric soils list for hydric inclusions.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Wetland W5 is in a small, frequently flooded area at the top of the east bank of Plum Creek on the south edge of the proposed right-of-way. List of dominant herbaceous species is incomplete due to the date of the survey. Soils were examined under low light conditions.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	14 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PFO1 (Bottomland hardwood forest)
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W6

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Quercus phellos	Canopy	Facw+	Cardamine bulbosa	Herb	Obl
Quercus nigra	Canopy/herb	Fac+	Carex intumescens	Herb	Facw
Liquidambar styriciflua	Canopy/Sapl	Fac+	Vitis rotundifolia	Vine	Fac
Acer rubrum	Sapl/Shrub	Fac	Toxicodendron radicans	Vine	Fac
Quercus pagoda	Canopy	Fac+	Carex oxylepis	Herb	Facw-
Quercus michauxii	Canopy	Facw-	Carex amphibola var. corrugata	Herb	Facw
Ulmus rubra	Shrub	Fac	Carex caroliniana	Herb	Facw
Ulmus alata	Shrub	Facu-	Berchemia scandens	Vine	Facw

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 94%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- _ Stream, Lake, or Tide Gauge
- _ Aerial Photographs
- _ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water:	0-6	(in.)
Depth to Free Water in Pit:	8	(in.)
Depth to Saturated Soil:	0	(in.)

Remarks: Outer floodplain of the Noxubee River

Wetland Hydrology Indicators:

Primary Indicators:

- x Inundated
- x Saturated in Upper 12 Inches
- _ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- _ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- _ FAC-Neutral Test
- _ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Urbo-Mantachie Association	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Urbo – Aeric Haplaquept Mantachie – Aeric Fluvaquent	Field Observations Confirm Mapped Type?	Yes	No	x

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	10YR 6/1	7.5YR 5/4	30%	Loamy sand

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions	x	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Urbo-Mantachie Association is listed on hydric soils lists for hydric inclusions

WETLAND DETERMINATION

					Is this Sampling Point Within a Wetland?	Yes	x	No	
Hydrophytic Vegetation Present?	Yes	x	No						
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Bottomland hardwood forested wetland. Forested wetland extends for an undetermined distance to the south. Adjacent area to the north has been clear-cut recently and has been converted to emergent and scrub-shrub wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PFO1
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W7

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Platanus occidentalis	Canopy	Facw-	Senecio glabellus	Herb	Facw+
Quercus nigra	Canopy	Fac	Berchemia scandens	Vine	Facw
Ligustrum sinense	Shrub	Fac			
Cornus foemina	Shrub	Facw-			
Smilax rotundifolia	Vine	Fac			
Lonicera japonica	Vine	Fac-			
Toxicodendron radicans	Vine	Fac			
Carex amphibola var. corrugata	Herb	Facw			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 91%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water:	0-2	(in.)
Depth to Free Water in Pit:	8	(in.)
Depth to Saturated Soil:	0	(in.)

Remarks: Drainage through this area altered by road construction. Wetland is associated with a wet-weather conveyance.

Wetland Hydrology Indicators:

Primary Indicators:

- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ___ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Oktibbeha silty clay loam, 5-8% slopes, eroded	Drainage Class:	Moderately well-drained		
Taxonomy (Subgroup):	Vertic Hapludalf	Field Observations Confirm Mapped Type?	Yes	No	x

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-6	A	10YR 3/1			Silty clay loam
6-10	B	10YR 3/1	7.5 YR 4/6	10%	Silty clay loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Wetland is associated with an intermittent stream that has been altered by construction of Route 45.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	12 March and 16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS

Do normal circumstances exist on the site?	Yes	x	No		Community ID: PSS1 (forest clear-cut)
Is the site significantly disturbed (Atypical Situation)?	Yes		No	x	Transect ID:
Is the area a potential problem area? (If needed, explain on reverse)	Yes		No	x	Plot ID: W8

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Liquiadmbar styriciflua	Shrub	Fac+	Juncus coriaceous	Herb	Facw
Ligustrum sinense	Shrub	Fac	Festuca subverticillata	Herb	Facu
Populus deltoides	Shrub	Fac+			
Quercus phellos	Shrub	Facw-			
Salix nigra	Shrub	Obl			
Lonicera japonica	Vine	Fac-			
Carex oxylepis	Herb	Facw-			
Valerianella radiata	Herb	Fac-			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 70%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water:	0-2	(in.)
Depth to Free Water in Pit:	0	(in.)
Depth to Saturated Soil:	0	(in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

- ____ Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- x Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ____ Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Oktibbeha silty clay loam, 5-8% slopes, eroded	Drainage Class:	Moderately well-drained		
Taxonomy (Subgroup):	Vertic Hapludalf	Field Observations Confirm Mapped Type?	Yes	No	x

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	10YR 4/1	7.5YR 4/6	5%	Silty clay loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Scrub-shrub wetland W8 is in a low drainage area in a forest clear-cut.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	12 March and 16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PSS1 (Forest clear-cut)
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W9

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Quercus nigra	Shrub	Fac	Carex retroflexa	Herb	Upl (not listed)
Liquidambar styriciflua	Shrub	Fac+	Juncus tenuis	Herb	Fac
Salix nigra	Shrub	Obl	Solidago canadensis	Herb	Facu
Ligustrum sinense	Shrub	Fac	Sphagnum sp.		
Lonicera japonica	Vine	Fac-			
Ranunculus sardous	Herb	Fac+			
Carex cherokeensis	Herb	Facw-			
Carex vulpinoidea	Herb	Obl			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 73%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: 0-1 (in.)
- Depth to Free Water in Pit: ___ (in.)
- Depth to Saturated Soil: 0 (in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Oktibbeha silty clay loam, 5-8% slopes, eroded	Drainage Class:	Moderately well-drained		
Taxonomy (Subgroup):	Vertic Hapludalf	Field Observations Confirm Mapped Type?	Yes	No	x

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	10YR 4/1	7.5YR 4/6	5%	Silty clay loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Scrub-shrub wetland W9 is in a low drainage area in a forest clear-cut.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	15 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PFO1 (Bottomland hardwoods)
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W10

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Quercus nigra	Canopy	Fac+	Toxicodendron radicans	Vine	Fac
Fraxinus pennsylvanica	Canopy/Shrub	Facw	Arundinaria gigantea	Herb	Facw
Acer rubrum	Canopy	Fac	Aster lanceolatus	Herb	Facw
Celtis laevigata	Canopy/Sapl	Facw	Carex intumescens	Herb	Facw
Acer negundo	Sapl/Shrub	Facw	Carex amphibola var. corrigata	Herb	Facw
Ulmus americana	Shrub	Facw+	Senecio glabellus	Herb	Facw+
Platanus occidentalis	Shrub	Facw-	Lycopus virginicus	Herb	Obl
Smilax rotundifolia	Vine	Fac	Polygonum setaceum	Herb	Facw

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water:	0-2	(in.)
Depth to Free Water in Pit:	8	(in.)
Depth to Saturated Soil:	0	(in.)

Remarks: Swale in Noxubee River floodplain

Wetland Hydrology Indicators:

Primary Indicators:

- ____ Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Urbo-Mantachie Association	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Urbo – Aeric Haplaquept Mantachie – Aeric Fluvaquent	Field Observations Confirm Mapped Type?	Yes x	No	

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-4	A	10YR 4/2			Silty loam
4-10+		10YR 4/1	10YR 4/3	10%	Silty clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions	x	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Urbo-Mantachie Association is listed on hydric soils lists for hydric inclusions.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes x	No
Wetland Hydrology Present?	Yes	x	No				
Hydric Soils Present?	Yes	x	No				

Remarks: Wetland W10 is in an eroded swale in the Noxubee River floodplain.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	15 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PFO1 (Bottomland hardwood forest)
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W11

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Liquidambar styriciflua	Canopy	Fac+	Smilax rotundifolia	Vine	Fac
Platanus occidentalis	Canopy	Facw+	Toxicodendron radicans	Vine	Fac
Carya ovata	Canopy	Facu	Cardamine bulbosa	Herb	Obl
Fraxinus pennsylvanica	Canopy/Shrub	Facw	Senecio glabellus	Herb	Facw+
Quercus shumardii	Canopy	Facw-	Viola sororia	Herb	Fac
Ulmus americana	Shrub	Facw	Carex socialis	Herb	Upl (not listed)
Celtis laevigata	Shrub	Facw	Ranunculus caroliniana	Herb	Facw+
Ilex decidua	Shrub	Facw-			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 87%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: 0-6+ (in.)
- Depth to Free Water in Pit: 10 (in.)
- Depth to Saturated Soil: 6 (in.)

Remarks: Surface water in floodplain depressions and swales

Wetland Hydrology Indicators:

Primary Indicators:

- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- x Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Urbo-Mantachie Association	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Urbo – Aeric Haplaquept Mantachie – Aeric Fluvaquent	Field Observations Confirm Mapped Type?	Yes x	No	

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-3	A	10YR 4/2			Silt loam
3-8	B	10YR 4/2	10YR 5/1	20%	Loamy clay
		10YR 3/2	10%		
8-10+	B	10YR 4/1	10YR 4/2	35%	Loamy clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes x	No
Wetland Hydrology Present?	Yes	x	No				
Hydric Soils Present?	Yes	x	No				

Remarks: Bottomland hardwood forested wetland in the Noxubee River floodplain

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	15 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PFO1 (Bottomland hardwood forest)
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W12

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Liquidambar styriciflua	Canopy	Fac+	Vitis rotundifolia	Vine	Fac
Ulmus americana	Canopy	Facw	Lonicera japonica	Vine	Fac-
Carya cordiformis	Canopy	Fac	Carex socialis	Herb	Upl (not listed
Acer negundo	Sapling/Shrub	Facw	Carex amphibola var. corrugata	Herb	Facw
Cercis canadensis	Shrub	Facu	Cardamine bulbosa	Herb	Obl
Carpinus caroliniana	Shrub	Fac	Senecio glabellus	Herb	Facw+
Quercus michauxii	Shrub	Facw-			
Quercus velutina	Shrub	Upl			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 71%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ____ Stream, Lake, or Tide Gauge
- ____ Aerial Photographs
- ____ Other
- x No Recorded Data Available

Field Observations:

Depth of Surface Water:	1-12+	(in.)
Depth to Free Water in Pit:	0	(in.)
Depth to Saturated Soil:	0	(in.)

Remarks: Depression /swale in Noxubee River floodplain

Wetland Hydrology Indicators:

Primary Indicators:

- x Inundated
- x Saturated in Upper 12 Inches
- ____ Water Marks
- ____ Drift Lines
- x Sediment Deposits
- ____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- ____ Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- x Local Soil Survey Data
- ____ FAC-Neutral Test
- ____ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Urbo-Mantachie Association	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Urbo – Aeric Haplaquept Mantachie – Aeric Fluvaquent	Field Observations Confirm Mapped Type?	Yes x	No	

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	10YR 4/1	10YR 4/4	10%	Loamy clay

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
x	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions	x	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	x	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Flooded depression or long swale in Noxubee River forested floodplain.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PEM1 (altered area; isolated)
Is the site significantly disturbed (Atypical Situation)?	Yes x No	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W14

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Fraxinus pennsylvanica	Shrub	Facw	Ranunculus sardous	Herb	Fac+
Gelsemium sempervirens	Vine	Fac	Eupatorium serotinum	Herb	Fac
Lonicera japonica	Vine	Fac-			
Rubus argutus	Shrub	Fac			
Carex vulpinoidea	Herb	Obl			
Carex festucacea	Herb	Facw			
Carex cherokeensis	Herb	Facw-			
Juncus coriaceus	Herb	Facw			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 90%

Remarks:

HYDROLOGY

Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: ___ (in.)
- Depth to Free Water in Pit: ___ (in.)
- Depth to Saturated Soil: 0 (in.)

Remarks: On an initial wetland survey of this line on March 12, 2003, most of this wetland area contained 1-2 inches of standing water. Alterations in this area affecting hydrology are two old farming or forestry roads that converge here and piles of excavated or scraped soils.

Wetland Hydrology Indicators:

Primary Indicators:

- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- x Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Oktibbeha silty clay loam, 5-8% slopes, eroded	Drainage Class:	Moderately well-drained		
Taxonomy (Subgroup):	Vertic Hapladalf	Field Observations Confirm Mapped Type?	Yes	No	

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-2		2.5Y 5/2	2.5Y 5/1	10%	Silt loam
2-12		2.5Y 5/3	10YR 5/6	30%	Sandy loam

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime		Listed on Local Hydric Soils List
	Reducing Conditions		Listed on National Hydric Soils List
	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	No	x
Wetland Hydrology Present?	Yes	x	No					
Hydric Soils Present?	Yes		No	x				

Remarks: This area on the edge between a hayfield and a forested area is where two old farm or forestry roads converge and appears to have been used for some purpose that required clearing and scraping surface soils into piles (perhaps a logging landing or equipment parking) where the roads converge. The area is about ½ acre or less and is isolated.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Proposed Columbus DeKalb Transmission Line right-of-way	Date:	16 April 2003
Applicant/Owner:	TVA	County:	Noxubee
Investigator:	B. Rosensteel, P. Durr	State:	MS
Do normal circumstances exist on the site?	Yes x No	Community ID:	PFO1
Is the site significantly disturbed (Atypical Situation)?	Yes No x	Transect ID:	
Is the area a potential problem area? (If needed, explain on reverse)	Yes No x	Plot ID:	W15

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
Quercus phellos	Canopy/Sapl/ Shrub	Facw-			
Fraxinus americana	Canopy/Sapling	Facu			
Smilax rotundifolia	Vine	Fac			
Carex oxylepis	Herb	Facw-			
Allium canadense	Herb	Facu-			
Aster lanceolatus	Herb	Facw			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 67%

Remarks: Vegetation in the herbaceous layer was sparse, possibly due to a combination of shading and hydrology.

HYDROLOGY

Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other
- x No Recorded Data Available

Field Observations:

- Depth of Surface Water: ___ (in.)
- Depth to Free Water in Pit: ___ (in.)
- Depth to Saturated Soil: 0 (in.)

Remarks:

Wetland Hydrology Indicators:

Primary Indicators:

- ___ Inundated
- x Saturated in Upper 12 Inches
- ___ Water Marks
- x Drift Lines
- x Sediment Deposits
- x Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

- x Oxidized Root Channels in Upper 12 Inches
- x Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase):	Leeper silty clay	Drainage Class:	Somewhat poorly drained		
Taxonomy (Subgroup):	Vertic Hapludalf	Field Observations Confirm Mapped Type?	Yes	x	No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast (%)	Texture, Concretions, Structure, etc.
0-10	A	10YR 5/1	10YR 4/2	15%	Silty clay
			10YR 4/6	15%	

Hydric Soil Indicators:

	Histosol		Concretions
	Histic Epipedon		High Organic Content in Surface Layer in Sandy Soils
	Sulfidic Odor		Organic Streaking in Sandy Soils
	Aquic Moisture Regime	x	Listed on Local Hydric Soils List
	Reducing Conditions	x	Listed on National Hydric Soils List
x	Gleyed or Low-Chroma Colors		Other (Explain in Remarks)

Remarks: Leeper silty clay is associated with Griffith, Catalpa, and Marietta soils. All four of these soils are on the national and state hydric soils lists for hydric inclusions.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	x	No		Is this Sampling Point Within a Wetland?	Yes	X	No	
Wetland Hydrology Present?	Yes	x	No						
Hydric Soils Present?	Yes	x	No						

Remarks: Mature forested wetland in the west floodplain of Plum Creek. Possibly connected to the nearby wetland W4 at some point north of the proposed right-of-way.