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FINAL ENVIRONMENTAL IMPACT STATEMENT

RUTHERFORD-WILLIAMSON-DAVIDSON POWER SUPPLY IMPROVEMENT PROJECT

Rutherford, Williamson, and Maury Counties, Tennessee

TENNESSEE VALLEY AUTHORITY

APRIL 2008

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Proposed project: Rutherford-Williamson-Davidson
Power Supply Improvement Project
Rutherford, Williamson, and Maury Counties, Tennessee

Lead agency: Tennessee Valley Authority

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Abstract: The Tennessee Valley Authority (TVA) proposes to construct and operate a new 500-kilovolt (kV) Rutherford Substation, a new 27-mile 500-kV transmission line, and two new 9- and 15-mile 161-kV transmission lines in Rutherford, Williamson, and Maury counties. The electrical load growth in this area, including Murfreesboro, Franklin, and surrounding areas of Middle Tennessee, will soon exceed the capacity of the three 500-kV substations and several of the 161-kV transmission lines serving the area by 2010. The environmental impact statement (EIS) evaluates various alternatives (solutions) that could respond to the identified need for action. This includes increased load management and conservation. After evaluating these solutions, only one, involving the new Rutherford Substation and associated transmission lines, appears to address this need. The proposed 500-kV transmission line would connect TVA's Maury 500-kV Substation near Columbia, Tennessee, with the new Rutherford 500-kV Substation in southwest Rutherford County. The 161-kV transmission lines would connect the new substation with Middle Tennessee Electric Membership Corporation's Christiana and Almaville 161-kV substations and TVA's Murfreesboro-Triune-East Franklin 161-kV Transmission Line. Most of the 500-kV line would be built on TVA-owned, vacant transmission line right-of-way, as would about 6 miles of the 24 miles of new 161-kV lines. The EIS describes the effects of the No Action Alternative and the Action Alternative, including the various corridors for new transmission line rights-of-way.

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SUMMARY

This summary covers the major points of the environmental impact statement (EIS) prepared for the Rutherford-Williamson-Davidson Power Supply Improvement Project. The Tennessee Valley Authority's (TVA) proposed action is to construct and operate a new 500-kilovolt (kV) substation, a 27-mile 500-kV transmission line, and 24 miles of 161-kV transmission lines. Most of the 500-kV transmission line and 6 miles of the 161-kV transmission lines would be on vacant right-of-way (ROW) already owned by TVA. Most of the proposed facilities would be in Rutherford County. This EIS has been prepared to assist TVA in meeting the requirements of the National Environmental Policy Act, including informing the public and TVA decision makers about the potential impacts of the proposed action.

PURPOSE OF AND NEED FOR ACTION

The population in Murfreesboro, Franklin, and surrounding areas of Middle Tennessee has grown at a rate of 4.3 percent per year since 1990. TVA supplies bulk electricity to this area through its Davidson, Pinhook, and Wilson 500-kV substations. As a result of the rapid population growth, the electrical load for this area has grown by about 3.5 percent per year and is expected to exceed the capacity of the three 500-kV substations serving the area by 2010. Several 161-kV transmission lines serving the area from these substations are also expected to become overloaded by 2010. Unless action is taken to address these problems, TVA's ability to continue to provide reliable electric service will be undermined, and service to entities and persons who rely on TVA electric power will be degraded and disrupted more frequently and for longer periods. Brownouts and blackouts could occur.

TVA has studied these problems and concluded that the best method of remedying them is either to construct a new 500-kV substation or expand an existing 500-kV substation. This would also require the construction and operation of new 500-kV and 161-kV transmission lines and/or upgrades to existing transmission lines.

ALTERNATIVES

After identifying the need for increased high-voltage transmission capacity, TVA evaluated the following four solutions to meet this need.

1. Construct and operate a new 500-kV substation in southwest Rutherford County, 25-30 miles of 500-kV transmission line on vacant, TVA-owned ROW, and about 24 miles of new 161-kV transmission lines in Rutherford, Maury, and Williamson counties.
2. Construct and operate a new 500-kV substation in northeast Williamson County near Brentwood and upgrade about 126 miles of existing 161-kV transmission lines. The transmission lines to be upgraded are in Davidson, Rutherford, Williamson, Sumner, Coffee, Franklin, and Bedford counties.
3. Expand TVA's Pinhook 500-kV Substation in southeast Davidson County and upgrade of about 134 miles of existing 161-kV transmission lines. These transmission lines are located in Davidson, Rutherford, Williamson, Sumner, Wilson, Franklin, and Bedford counties.

4. Rely on load management and conservation by achieving a reduction in current peak loads by at least 800 megawatts.

Further evaluation of these four potential solutions eliminated all but the first as not able to meet the project need. The other two construction solutions had higher overall costs, engineering problems, and problems in meeting the 2010 in-service date. The load management/conservation solution would not achieve the necessary load reduction by 2010 or address the risk to reliability resulting from future system load growth.

The alternatives evaluated in further detail in this EIS are the following:

Under Alternative 1, the No Action Alternative, TVA would not address the forecast high-voltage transmission capacity problem by implementing any of the potential solutions identified above. This would make existing electrical supplies unstable and increase likelihood of both planned and unplanned power outages (brownouts/blackouts) in the Middle Tennessee area as the demand continued to grow.

Under Alternative 2, TVA would construct and operate a new 500-kV substation in southwest Rutherford County and associated 500-kV and 161-kV transmission lines. The preferred locations for these facilities were determined through a rigorous siting process, which included evaluations of natural and cultural features, land use, engineering attributes, and cost. The preferred locations are illustrated in Figure S-1. The substation would be located on Coleman Hill Road, about 4 miles east of U.S. Alternate Highway 31/41. A 27-mile 500-kV transmission line would be built on vacant, TVA-owned ROW between TVA's existing Maury 500-kV Substation and the proposed new substation. A 9-mile 161-kV transmission line would connect the new substation to Middle Tennessee Electric Membership Corporation's (MTEMC) existing Almaville 161-kV Substation; 6 miles of this line would be on vacant TVA-owned ROW, and the remainder would be on new ROW. A 15-mile 161-kV transmission line on new ROW would connect the new substation to MTEMC's existing Christiana 161-kV Substation.

The preferred substation site and transmission line routes have been adjusted from the original proposal based on public and property-owner input and to minimize overall project impacts. Compared to the other potential sites and route combinations, the preferred site and routes are expected to have the least overall project impacts and be the most cost-effective solution.

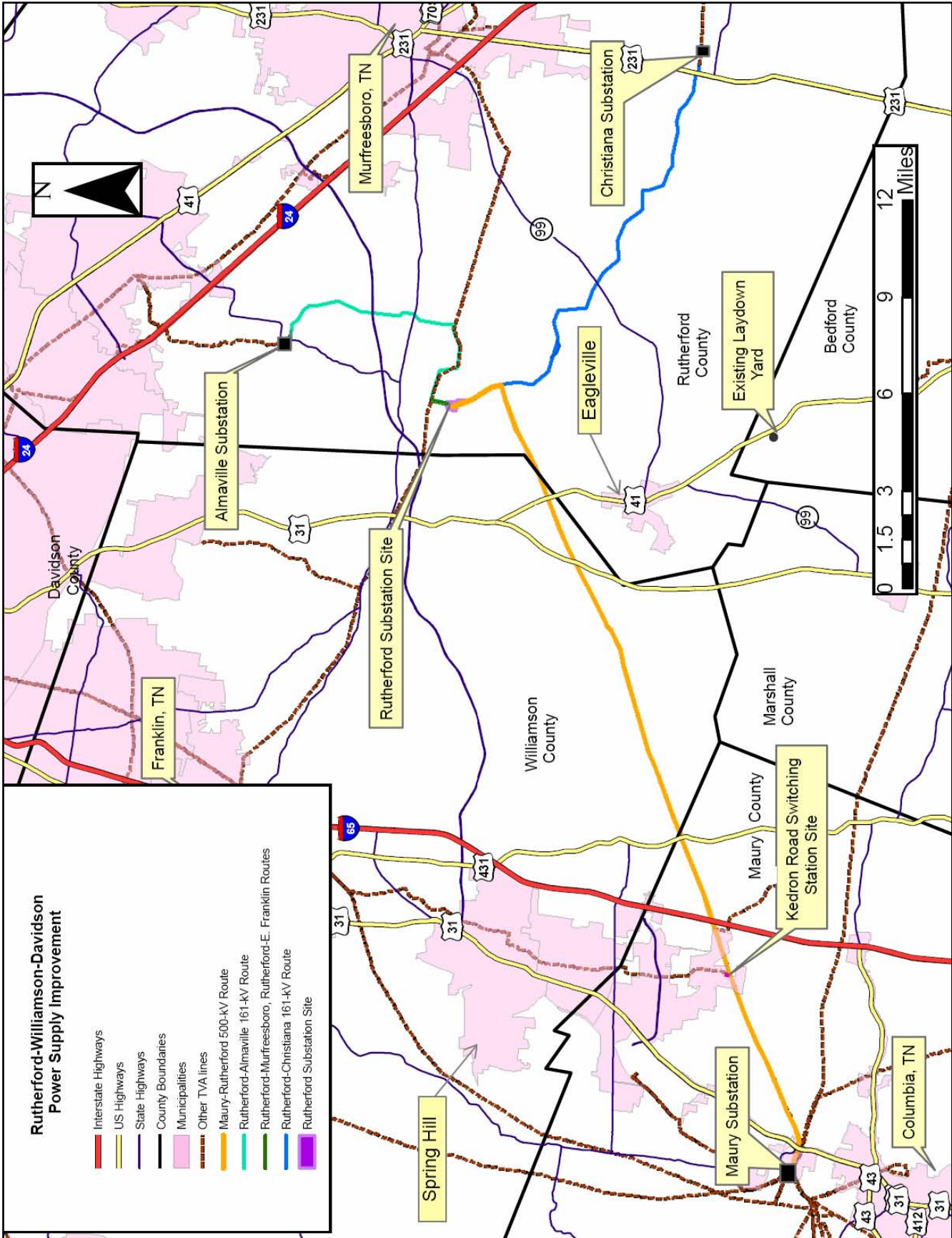


Figure S-1. Proposed Rutherford 500-kV Substation and Associated 500-kV and 161-kV Transmission Lines

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Groundwater

The project area is underlain by limestone aquifers in Ordovician-aged rocks, in what is known as the Central Basin aquifer system. The carbonate or limestone rocks that form the Central Basin aquifer are susceptible to erosion and dissolution and are typical of karst systems. Typical karst features include sinkholes, springs, disappearing and reappearing streams, and caves. Groundwater in karst systems is easily contaminated because the waters can travel long distances through conduits with no chance for natural filtering processes of soil or bacterial action to reduce the contamination. Much of the proposed project area is underlain by karst terrain, and the proposed ROWs intersect a total of 68 karst features.

In the Rutherford-Williamson-Maury tricounty area, the groundwater in the Ordovician aquifers is considered hard and contains high concentrations of dissolved solids, chlorine, and iron. These concentrations, however, are equal to or less than U.S. Environmental Protection Agency's (USEPA) secondary maximum contaminant levels for drinking water. The quality of the water generally is adequate for domestic use, or it can be treated and made adequate for most uses. Public drinking water for Rutherford, Williamson, and Maury counties is supplied by both surface water and groundwater sources. A State Designated Source Water Protection Area is located within the project area.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the Rutherford Substation, the Maury, Almadale, and Christiana transmission lines, and the associated access roads would not be built, resulting in no environmental impacts to groundwater. Changes to groundwater would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

TVA best management practices (BMPs) would be used during construction and operation of the proposed facilities to avoid or reduce impacts on groundwater and to control storm water runoff and sediment infiltration. Only USEPA-registered herbicides would be applied in accordance with manufacturers' directions. Herbicides with groundwater contamination warnings would not be used in areas where karst features occur. These areas include the proposed ROW between Double Branch and Double Branch Road, Greens Mill Road and Cornstock Road, Cross Keys Flat to Boon Creek, along the Almadale Transmission Line between the intersection of the Murfreesboro-Triune-East Franklin 161-kV Transmission Line, north to where the transmission line turns west, on the Christiana Transmission Line between Coleman Hill Road south to Panther Creek Road and within 500 feet of the entrance to Nanna Cave. No herbicides or fertilizers would be used in the groundwater source protection zone on the Maury Transmission Line ROW between Windrow Road and Arno-Allisona Road.

A septic system to serve the proposed substation site would be built on the substation site in accordance with requirements of the county and the Tennessee Department of Environment and Conservation (TDEC). The use of BMPs and oil contaminant facilities would help ensure that groundwater is not affected by the proposed substation.

With the use of BMPs and use of control measures normally applied by TVA, potential effects to groundwater quality would be insignificant.

Surface Water

The project area drains to tributaries of the Harpeth River, Stones River, Duck River, and Cheatham Reservoir in the Cumberland River basin and Kentucky Reservoir in the Tennessee River basin. Larger named streams in the project area include Overall Creek, Panther Creek, West Fork of the Stones River, Harpeth River, Rutherford Creek, Double Branch, Crooked Creek, Little Flat Creek, and Nelson Creek. Most of these streams are classified for fish and aquatic life, recreation, irrigation, and livestock watering and wildlife. West Fork of the Stones River, Harpeth River, and Rutherford Creek have the additional classifications of domestic and industrial water supply.

Several streams in the project area are assessed by the State of Tennessee on the 2006 TDEC 303(d) list as impaired because of pollutant loadings that exceed established water quality standards.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to surface water would occur. Changes to surface waters would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

Construction of the proposed transmission lines would require crossing several streams, including the Harpeth River. Potential impacts to streams include siltation and removal of streamside tree canopy. These impacts would be minimized through avoiding stream crossings where possible, by implementation of BMPs, and by minimizing vegetation clearing on stream banks. Impacts to surface waters are expected to be insignificant.

Aquatic Ecology

Streams of the Nashville Basin are characterized by low to moderate gradient and are virtually paved in some areas with expanses of limestone bedrock interspersed with rock rubble riffle areas, silty basins, and some sand and gravel reaches. Many streams are dry and reduced to isolated pools or are subterranean during the late summer and fall. The limestones freely leach nutrients and, consequently, waters are very productive, and algae and rooted vegetation are abundant in streams. The upper Duck, Stones, and Harpeth rivers support diverse aquatic communities. These rivers support 102, 72, and 64 native fish species, respectively. Other types of aquatic life are expected to be similarly diverse in these drainages.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to aquatic ecology would occur. Changes to aquatic ecology would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

Aquatic life can be impacted either directly by alteration of habitat conditions within the streambed or indirectly due to modification of the riparian zone and storm water runoff resulting from construction and maintenance activities along the transmission line route and the associated access roads. Potential impacts due to removal of streamside vegetation within the riparian zone include increased erosion and siltation, loss of in-stream habitat, and increased stream temperatures. Other potential construction and maintenance impacts include alteration of stream banks and stream bottoms by heavy equipment and runoff of herbicides into streams. Although the potential for impacts varies among the transmission line ROWs, overall impacts to aquatic ecology, with implementation of standard BMPs and additional protective measures, are expected to be insignificant.

Vegetation

Forest, pasture, and cropland are the dominant cover types in this region. Major plant community types in this study area are oak-hickory forest, mesic maple forest, riparian forest, mixed evergreen-deciduous and evergreen forest, herbaceous vegetation, and limestone cedar glades.

The Nashville Basin ecoregion is a floristically diverse area that harbors a number of rare plant communities. Ten rare community types are known from the Maury, Williamson, and Rutherford county area. Of these, four are associated with limestone glades and occur in the areas of the proposed transmission lines and substation. These communities include the Southern Glade Margin Shrubland, Interior Low Plateau Limestone Glade Ephemeral Pool, Limestone Seep Glade, and Limestone Annual Grass Glade. Limestone glades are perhaps the most unique vegetation types occurring on shallow soil and large outcrops of limestone common in the region. Glade communities typically are rich in endemic plant species (plants that grow in no other habitat); at least 22 plant species are endemic to limestone glades and four of these plant species are found only in Middle Tennessee.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no project-related impacts to the terrestrial ecology of the region would occur since terrestrial communities would not be modified. Terrestrial communities would vary over time as other factors such as human population, land use and development, and recreational patterns change within the area.

Alternative 2 – The Action Alternative

Construction of the proposed substation would permanently remove vegetation on much of the Rutherford Substation site and would alter vegetation on virtually the entire site. Over 95 percent of the site is highly disturbed herbaceous vegetation, and no uncommon or high quality terrestrial plant communities occur on the site.

Construction, operation, and maintenance of the substation, transmission lines, and associated access roads would result in the clearing of approximately 370 acres of forested land to accommodate the proposed new Maury, Almadale, and Christiana transmission lines. This would result in the long-term conversion of forested areas to early successional habitats. According to the U.S. Forest Service, the central portion of Tennessee, where the transmission lines would be built, has experienced a small increase in forest cover between 1989 and 2005. The increase is around 6 percent or approximately 150,000 acres. The conversion of 370 acres of forestland to ROW is inconsequential when considered with regional trends in forest cover. Four types of rare plant communities occur within the

project areas. To minimize impacts to rare communities, vehicle access and herbicide use would be prohibited at locations where these communities are found.

Wildlife

Much of the land within the proposed substation site, transmission line ROWs, and associated access roads is heavily disturbed and shaped by previous agricultural, forestry, and development practices. Common habitat types in the project area include early successional habitats (52 percent) composed of existing ROW, pasture, cropland, shrubland, limestone cedar glades, and forested habitats (48 percent). The forested habitat occurs mostly in fragments, although relatively large blocks of contiguous forest occur on Indian Mountain and Scales Mountain along the proposed Almaden Transmission Line ROW. The composition and abundance of wildlife species in terrestrial environments of the project area vary with habitat type and size, food availability, surrounding land use, and other limiting factors. Similar species of wildlife occur throughout each section of this project.

The Snail Shell Cave System is located within the project area and has been documented as biologically significant. Ten caves occur within 3 miles of the project area, and several entrances to the Snail Shell Cave System occur near the Christiana Transmission Line section. No heron colonies occur in the project area.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to wildlife would occur. Changes to wildlife would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

Potential impacts to wildlife would result from the long-term conversion of forest to early successional habitats and from the creation of forest-edge habitat. This would be detrimental to forest-dwelling wildlife but beneficial to species requiring early successional grasslands/shrub habitats.

Pollution from chemicals and sedimentation from disturbed soil could impact nearby caves. However, the use of BMPs will help safeguard against this risk. In addition, a 500-foot-radius buffer with restrictions would be established in the area around Nanna Cave during the construction and maintenance of the transmission lines. If the placement of a pole was unavoidable in this buffer or in the area of the proposed route crossing a subterranean section of the Snail Shell Cave System, it would be placed with drilling if necessary; no blasting would occur.

Although wildlife populations continue to be impacted by development in the area, overall significant impacts to terrestrial wildlife and their habitats is not expected as a result of the proposed project. The surrounding landscape is already highly disturbed from previous agricultural and forestry practices and from current development.

Endangered and Threatened Species

Four federally listed as endangered aquatic species (birdwing pearl mussel, Cumberland monkeyface, orange-foot pimpleback, and tan riffleshell), two aquatic candidate species for federal listing (rayed bean and slabside pearl mussel), as well as several state-listed

aquatic species occur in potentially affected stretches of rivers and their tributaries in the project area. A portion of the Duck River downstream of the project area is also designated critical habitat for the oyster mussel and Cumberlandian combshell.

Two federally listed plant species (Braun's rock-cress and Pyne's ground-plum) as well as designated critical habitat for Braun's rock-cress occur in the project area. Eight state-listed plant species were also observed in the affected project area. Most of the listed plants occur in limestone glades.

Gray bat and Indiana bat, both federally listed as endangered, have been previously reported in the project area. No caves suitable for either of these species occur in the immediate vicinity of the project components; potential summer roost habitat for the Indiana bat is present. A few state-listed species are known to occur or potentially occur in the project area; these species occupy caves or limestone glade habitat. No federally listed or state-listed terrestrial animals were observed in the proposed project areas during field investigations.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built to address the transmission system problems, and the resulting impacts to endangered or threatened species resulting from the Action Alternative would not occur. The status and conservation of the potentially affected listed species and critical habitats would continue to be determined by the actions of others. Changes to endangered and threatened species and their habitats would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

To minimize potential impacts to aquatic habitats and aquatic life, including federally or state-listed species, BMPs would be applied to all construction and maintenance activities. Additionally, all intermittent and perennial streams were assigned a Category A protection level that warrants additional protection measures.

The proposed action could adversely affect populations of the following state-listed plants: limestone fameflower, Canada lily, and Tennessee milk-vetch. There are, however, numerous other populations of each of these species in Tennessee, and many of these populations are on areas managed to conserve them. Any adverse effects that could result from the proposed action would not adversely affect the species as a whole or their viability in Tennessee. In order to avoid adverse impacts to other state-listed plants, TVA would avoid the areas during construction and maintenance, unless there is no practical alternative. TVA also identified several mitigation measures to further reduce these potential impacts. With the implementation of these mitigation measures, impacts to other state-listed plants would not be adverse.

The proposed transmission line routes were modified during the planning process to reduce potential impacts to the federally listed Pyne's ground-plum and Braun's rock-cress and critical habitat for Braun's rock-cress. TVA also identified several mitigation measures to reduce these potential impacts further. In the light of this, TVA has determined that Pyne's ground-plum and Braun's rock-cress would not be adversely affected and the critical habitat for Braun's rock-cress would not be adversely modified.

Access roads associated with the Maury and Christiana transmission lines that contain habitat for federally and state-listed plant species and could contain members of these species would be resurveyed during the growing season (March to May) prior to use for any ROW construction or clearing. If species are found, adjustments would be made to avoid impacting them.

In order to minimize impacts to potential summer roosting habitat for the Indiana bat, TVA would implement the mitigation measures that restrict the timing of timber harvesting to the season when Indiana bats are absent. TVA has determined that effects on the Indiana bat would not be adverse with implementation of this measure. With implementation of mitigation measures for the protection of caves, impacts on state-listed animals would be insignificant.

To help minimize potential impacts to the gray bat, a 500-foot-radius buffer at the entrance to Nanna Cave and standard BMPs at all stream crossings would be implemented during the construction and maintenance of the transmission lines.

In compliance with Section 7 of the Endangered Species Act, TVA consulted with the U.S. Fish and Wildlife Service (USFWS) over the potential effects on aquatic animals, terrestrial animals, plant species, and the federally designated critical habitat. The USFWS concurred with TVA's determination that the proposed action would not likely adversely affect any federally listed species or adversely modify the designated critical habitat.

Wetlands

Thirteen wetlands having a combined area of 3.43 wetland acres were identified on the proposed substation site and within the ROWs of the proposed transmission lines and associated access roads. Of the 3.43 acres, 2.29 acres were forested with 2.04 considered of moderate quality and degraded but with a reasonable potential for restoration, and 0.1 acre was of very high quality or of regional/statewide concern.

A 0.49-acre emergent wetland of moderate quality occurs on the proposed substation site. This wetland would be spanned by the transmission lines. Approximately 0.64 acre of forested wetland occurs within the proposed Maury Transmission Line ROW. The proposed Almaville Transmission Line ROW contains approximately 0.02 acre of forested wetland, and the proposed Christiana Transmission Line ROW contains 1.63 acres of forested wetland.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to wetlands would occur. Changes to wetlands would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

The construction and operation of the proposed Rutherford Substation would not directly affect wetlands. The construction and operation of the proposed transmission lines and the associated access roads would result in the long-term conversion of 2.29 acres of forested wetlands to scrub-shrub/emergent wetlands. This is not anticipated to result in significant direct or cumulative impacts to wetlands in the project area. Basic wetland functions would be retained.

Potential impacts to all other wetland areas resulting from possible vehicle and equipment access across these wetlands during the proposed transmission line construction would be minimized with BMPs. Similarly, BMPs would be used for all transmission line maintenance activities to ensure that wetland impacts are temporary and insignificant.

Floodplains

The proposed Maury, Almaville, and Christiana transmission line segments cross the 100-year floodplain of several rivers and streams. The proposed Rutherford 500-kV Substation in western Rutherford County is located outside the boundaries of the 100-year floodplain.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to floodplains would occur. Changes to these floodplains would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

The proposed Rutherford Substation in Rutherford County would be above the 100-year floodplain and would therefore have no floodplain impacts.

The proposed Maury, Almaville, and Christiana transmission line routes and some of the associated access roads cross several floodplain areas in Maury, Williamson, and Rutherford counties. Consistent with Executive Order (EO) 11988, an overhead transmission line and related support structures are considered repetitive actions 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 changes in flow-carrying capacity of the streams being crossed. Some of the access roads would involve construction in the 100-year floodplain. Consistent with EO 11988, a road is considered as a repetitive action in the 100-year floodplain. To minimize adverse impacts, any road construction in the 100-year floodplain would be done in such a manner that upstream flood elevations would not be increased.

Managed Areas

Managed areas and/or ecologically significant sites and streams listed on the Nationwide Rivers Inventory (NRI) occur within 3 miles of the proposed Rutherford Substation, the three associated transmission lines, and their access roads.

The proposed substation is within 1 mile of two Registered State Natural Areas (SNAs): Scales Mountain Knobs and Indian Mountain. Large portions of both SNAs are listed as designated critical habitat for Braun's rock-creep. The proposed Maury Transmission Line route would cross the NRI-listed Harpeth River, come within 0.5 mile of Haley-Jaqueth Wildlife Management Area (WMA), and would be within 3.0 miles of another NRI stream and three other natural areas. The proposed Almaville Transmission Line route would cross small portions of the two above-listed SNAs and is within 3.0 miles of an NRI stream. The proposed Christiana Transmission Line route would cross the NRI-listed West Fork of the Stones River, is within 0.5 mile of one managed area (Snail Shell Cave Preserve), and is within 3.0 miles of two NRI streams and one managed area.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to managed areas, ecologically significant sites, or NRI streams would occur. Changes to these features as well as their management objectives would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

The proposed substation is of sufficient distance from Scales Mountain Knobs SNA (0.8 mile) and Indian Mountain SNA (1.0 mile) that no impacts to these natural areas are anticipated from the construction and operation of the proposed substation. The proposed Almadillo Transmission Line would cross small portions of these SNAs. New crossings of two NRI streams—the Harpeth by the Maury Transmission Line and West Fork of the Stones River by the Christiana Transmission Line—would result in diminished scenic integrity of the streams, but no significant impacts to the streams' other recognized values. No impacts to the Haley-Jaqueth WMA or Snail Shell Cave Preserve that are within 0.5 mile of the proposed work or to other NRI streams or natural areas within 3.0 miles of the proposed work are anticipated.

Recreation

Primary recreational activities that occur in the project area are informal, dispersed, and occur on privately owned land. These include hunting, fishing, walking, horseback riding, off-road vehicle use, and nature viewing. There are no developed public recreation facilities near the proposed substation, transmission line routes, or their associated access roads.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to recreational activities would occur. Changes to recreation would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

Implementation of the Action Alternative would result in insignificant effects on public recreation activities and resources. Except for the substation, informal recreation activities could continue on lands potentially impacted by the proposed project.

Land Use and Prime Farmland

The project involves the construction of about 51 miles of new transmission lines and a 500-kV substation in Rutherford County that would occupy 53.1 acres. The substation location would be converted to industrial use. In accordance with the Farmland Protection Policy Act, this area was evaluated to determine its value as prime farmland. The construction of transmission lines and their support structures would not render farmland unusable, because the transmission line ROWs can still be farmed. The proposed substation site is mostly unimproved pastureland, part of which has been occasionally harvested for hay.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to land use or prime farmland would occur. Changes to land use

and prime farmland would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

The potential impacts to prime farmland from the Rutherford Substation site were evaluated using Form AD 1006, “Farmland Conversion Impact Rating.” This site scored 137, below the threshold score of 160. Impacts to prime farmland from developing these sites would be insignificant. The proposed transmission lines would have little impact on prime farmland.

Visual Resources

The proposed substation, transmission line routes, and the associated access roads cross diverse landscapes including the Harpeth River, several streams, areas of farms, forest, and low density residential development, as well as areas of higher density residential development and commercial development near Columbia. Near the proposed substation, scenic attractiveness is common, and scenic integrity is low due to human alterations of naturally evolving landscapes that are now agriculture and grazing lands.

Scenic attractiveness is minimal to common, and scenic integrity is low to moderate over most of the length of the transmission line routes. In the area near Indian Mountain and Scales Mountain Knob, scenic attractiveness is distinctive, and scenic integrity is moderate. This area has little public access and is a major focal point in the landscape from all directions due to their prominent peaks.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to visual resources would occur. Changes to the scenic quality of the area would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

Construction and operation of the proposed substation, transmission lines, and the associated access roads would result in long-term changes in visual character of the area resulting from the clearing of the ROW and the construction of metal transmission line support structures and transmission line conductors.

Visual impacts from the Rutherford Substation construction would be minimal. The substation location would not likely be visible from the road. Existing mature vegetation that would remain on the south and west sides of the substation, as well as undulating topography, would obscure most views. There may be some visual discord during the construction period due to an increase in the number of commercial vehicles accessing the site from Patterson Road. However, this would be temporary until all activities are complete. New substation lighting would comply with the TVA’s standard substation lighting guidelines.

The new transmission line and structures would add to the number of discordantly contrasting elements seen in the landscape. Vegetation removal for new ROW would reduce scenic integrity in areas unaltered by human development, especially in the Scales Mountain and Indian Mountain area. However, scenic class for any of the proposed

transmission line sections and the substation site would likely not be reduced by two levels or more, the threshold of significance used by TVA.

Cultural Resources

Historic properties, identified for their architectural/historical or archaeological significance, occur within the project area. The Rutherford Substation area of potential effect (APE) for archaeological resources consists of a 78-acre area including the access road. The APE for architectural investigations also includes a 0.5-mile radius surrounding the substation site. Two ineligible archaeological sites, 13 previously recorded archaeological properties, and six previously recorded ineligible historic buildings were identified.

The Maury Transmission Line route APE contains nine previously recorded ineligible archaeological sites, one previously recorded potentially eligible archaeological site, and six previously unrecorded ineligible sites. Additionally, 70 previously recorded architectural properties occur within this APE. Thirty-five of these have been destroyed, 12 are located outside the visual site of the Maury Transmission Line route, and 23 are ineligible due to their lack of architectural distinction and loss of integrity caused by modern alterations and/or damage. Three National Register of Historic Places- (NRHP) listed properties—William Ogilvie house, William Allison house, and Smithson-McCall farm—are located within the Maury Transmission Line APE. Thirty-one other previously unrecorded ineligible architectural sites were also identified.

Fifteen previously recorded ineligible architectural resources, one previously unrecorded ineligible architectural resource, and one previously unrecorded ineligible archaeological site were identified within the proposed Almatville Transmission Line APE.

Two previously unrecorded archaeological sites, 34 previously recorded ineligible architectural resources, one NRHP-listed property, and 15 previously unrecorded architectural resources were identified within the proposed Christiana Transmission Line APE. The Rockvale Store is NRHP-listed; however, since its listing, the building has been severely altered and does not retain sufficient integrity to remain listed.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built; therefore, no environmental impacts to cultural resources would occur. Changes to cultural resources would nonetheless occur over time as other factors such as population trends, land use and development, quality of air/water/soil, recreational patterns, and cultural, ecological, and educational interests change within the area.

Alternative 2 – The Action Alternative

The construction and operation of the proposed substation would not affect historic properties. The construction and operation of the Maury Transmission Line would not affect any listed or eligible archaeological sites. The William Ogilvie house, which is listed on the NRHP, no longer retains sufficient integrity for listing on the NRHP. The Maury Transmission Line would have adverse visual effects on two historic properties, the William Allison house and Smithson-McCall farm, listed on the NRHP. Neither the Almatville Transmission Line nor the Christiana Transmission Line would affect historic properties eligible for or listed on the NRHP. The construction of temporary access roads associated with the proposed transmission lines would not affect historic properties or archaeological sites.

In order to avoid adverse effects to archaeological site 40WM35, TVA would not place transmission line structures within the site or cause other ground disturbance of the site. If impacts to the site cannot be avoided in this manner, TVA would conduct further Phase II archaeological testing to identify locations for structure placement that would not adversely affect the site.

The Tennessee State Historic Preservation Officer (SHPO) has concurred with TVA's determinations for the substation, the Almadillo Transmission Line, and the Christiana Transmission Line in letters dated August 16, 2007, and August 23, 2007. In a letter dated June 29, 2007, the SHPO concurred with TVA's finding of adverse effects on the William Allison house and Smithson-McCall farm. TVA has developed and is implementing a memorandum of agreement (MOA) with the SHPO and other interested parties that prescribes measures to be undertaken by TVA to mitigate these adverse effects. These measures include avoiding archaeological site 40WM35 by not placing transmission line structures within the site or causing other ground disturbance of the site. If impacts to the site cannot be avoided in this manner, TVA would conduct further Phase II archaeological testing to identify locations for structure placement that would not adversely affect the site. Additionally, archaeological sites 40RD280 and 40RD281 were avoided by the rerouting of a section of the Christiana Transmission Line. TVA would minimize, to the extent practicable, the number and height of transmission line structures within the line-of-site of the William Allison house and the Smithson-McCall farm and use, where possible, vegetative screening measures at the landowners' request.

Socioeconomics

Rutherford County has a total population of 229,000 and with 370 persons per square mile is 2.5 times more densely populated than the state average. Williamson County has a population of about 161,000 and Maury County of about 78,000. All of these counties have experienced significant population growth in recent years.

Potential socioeconomic effects from the construction and operation of the proposed substation and transmission lines include changes in population, employment, housing, retail sales, property tax, and property values. These effects generally would be relatively similar across the project area.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built, and no other actions would be taken. However, due to rapid growth in population and electricity use in Murfreesboro, Franklin, and surrounding areas, substation and transmission line capacities are expected to be exceeded by 2010. New substation and transmission capacity would be necessary to meet this increased demand. Failure to provide this capacity would add instability to electrical supplies and increase the likelihood of both planned and unplanned power outages (brownouts/blackouts) in the area as demand continues to grow. This could result in significant losses to businesses and industries in the area. Individuals living or working in the area could suffer income losses as a result. Loss of electrical supply, especially during extreme weather conditions such as very hot or very cold temperatures, could impact and threaten human health and life depending on the duration and circumstances. Such impacts would be significant.

Alternative 2 – The Action Alternative

This substation and transmission lines would have no effect on population in the area; it is instead a response to growth already occurring and projected to continue in the Middle

Tennessee area. Construction would involve a relatively small crew of workers for a few months. Due to the nature of the project, most workers probably would either move in temporarily or commute from their current homes, especially within 50 or 60 miles. Consequently, there would be little or no change in employment of local workers. Little impact on housing is anticipated since many of the construction workers who move temporarily into the area likely would rent motel rooms or provide their own lodging using campers or trailers.

Some local business income and local government revenues would be generated during the construction period from purchases of items such as meals and from lodging or campground rental fees. The impacts of this additional revenue would be small. Some construction materials could be purchased locally, but due to their nature, most of the purchases would likely be outside the area. The increase in local tax revenues generally would not be noticeable.

Property values at some locations could be decreased in the range of a 5 to 10 percent. However, depending on market conditions, no change or an increase is also possible. The magnitude of the impact appears to be sensitive to distance, with little or no impact to properties not adjacent or very close. According to the Electric Power Institute, the impacts on property value tend to diminish over time, and some studies have found that they virtually disappear in about five years. No significant adverse impacts on property values are expected.

Environmental Justice

There is a potential for environmental justice impacts (disproportionate impacts on low-income and minority populations) as a result of the construction and operation of the proposed substation, transmission lines, and the associated access roads. These effects generally would be relatively similar across the project area.

The area around the proposed project area has a very small minority population. The largest minority population occurs in areas in Maury County, all of which have minority populations smaller than the county, state, and national averages, and one area in Williamson County that is higher than the county average but well below the state and national averages. Poverty levels are generally below the state and national levels. The proposed route is generally not densely populated, although there are occasional farms and subdivisions in view.

Alternative 1 – The No Action Alternative

Under the No Action Alternative, the proposed facilities would not be built. Failure to provide needed additional capacity would add instability to electrical supplies and increase the likelihood of both planned and unplanned power outages in the area as demand continues to grow. The resulting impacts on businesses, industries, and residences in the area however could occur anywhere in the area and are not likely to disproportionately affect minority or low-income populations. Therefore, no significant disproportionate environmental justice impacts would occur.

Alternative 2 – The Action Alternative

Due to the location of the proposed facilities and to the overall small proportion of minority and low-income residents, no environmental justice impacts are anticipated.

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GLOSSARY OF TERMS, ABBREVIATIONS, AND ACRONYMS

A	Abbreviation for Alternate Highway
acre	A unit measure of land area equal to 43,560 square feet
AMA	Acronym for the American Medical Association
APE	Acronym for area of potential effect
ARAP	Acronym for Aquatic Resource Alteration Permit
BG	Acronym for block group
blackout	A sudden and complete loss of electrical power; unplanned power outage causing lights to go out and all appliances and electrical devices not to work
BMP(s)	Acronym for best management practice(s), i.e., accepted construction practices designed to reduce environmental effects
brownout	A drop in voltage in an electrical power supply, so named because it typically causes the lights to dim
bulk electricity	Wholesale electricity sold to distributors and other large use customers
CFR	Acronym for Code of Federal Regulations
circuit	A section of conductors capable of carrying electricity to various points
conductors	Cables that carry electrical current
CT	Acronym for census tract
cultural resources	Archaeological and historic resources
danger tree	A tree located outside the right-of-way that could pose a threat of grounding a line if allowed to fall near a transmission line or a structure
DCH(s)	Acronym for designated critical habitat(s)
delivery point	The point at which TVA connects to its customers' facilities (TVA's customers include its power distributors, directly served industries, and some governmental facilities)
distribution line	A series of electrical conductors ("wires") and their supporting structures used to transfer electric power locally between substations or from substations to power consumers
easement	A legal agreement that gives TVA the right to use property for a purpose such as a right-of-way for constructing and operating a transmission line
EEDR	Acronym for Energy Efficiency and Demand Response
EIS	Acronym for environmental impact statement
EMF	Acronym for electric and magnetic fields

endangered species	A species in danger of extinction throughout all or a significant part of its range
EO	Acronym for Executive Order
endemic	Native or limited to a certain region; prevalent in or peculiar to a particular locality
ESA	Acronym for the Endangered Species Act
feller-buncher	A piece of heavy equipment that grasps a tree while cutting it, which can then lift the tree and place it in a suitable location for disposal; this equipment prevents trees falling into a sensitive area such as a wetland
GIS	Acronym for geographic information system
glade	An open space in a forest
glade habitat	Areas with unique vegetation types that are found only on shallow soil and large outcrops of limestone; glade communities typically are rich in endemic plant species
greenfield site	Land on which no urban development has previously taken place; usually understood to be on the periphery of an existing built-up area
groundwater	Water located beneath the ground surface in the soil pore spaces or in the pores and crevices of rock formations
guy	A cable connecting a structure to an anchor that helps support the structure
I-	Abbreviation for Interstate Highway
ibid	Abbreviation for the Latin term, <i>ibidem</i> , meaning “in the same place;” refers to the immediately preceding work cited
kV	Abbreviation for kilovolt (equal to 1,000 volts)
kW	Abbreviation for kilowatt (equal to 1,000 watts)
line loss	Electrical energy lost due to inherent inefficiencies in an electrical transmission and distribution system under specific conditions
load	That portion of the entire power in a network consumed within a given area; also synonymous with “demand” in a given area
MOA	Acronym for memorandum of agreement
MTEMC	Acronym for Middle Tennessee Electric Membership Corporation
MW	Abbreviation for megawatt (equal to 1,000,000 watts)
n.d.	Indicates “no date” (pertains to date Web site was accessed; abbreviation is shown in the Literature Cited section)
NEPA	Acronym for the National Environmental Policy Act (NEPA); this act signed into law January 1, 1970, established a national environmental policy and provides a framework for environmental planning and decision-making by federal agencies
NIEHS	Acronym for National Institute of Environmental Health Sciences
NOI	Acronym for notice of intent

NPDES	Acronym for National Pollutant Discharge Elimination System
NPS	Acronym for National Park Service
NRHP	Acronym for National Register of Historic Places
NRI	Acronym for Nationwide Rivers Inventory
occurrence (related to plants)	A single specimen or group of individuals not separated by distance
OSHA	Acronym for Occupational Safety and Health Administration
outage	An interruption of the electric power supply to a user
population (related to plants)	Population is an ecological term that refers to the entirety of a group of individuals of a certain species. One population can contain numerous occurrences. A population includes that there is the potential for exchange of genetic material between individuals.
reconductor	Replacing existing conductors with new higher-capacity conductors
riparian	Related to or located on the banks of a river or stream
RM	Acronym for river mile
ROW(s)	Acronym for right(s)-of-way; a corridor containing a transmission line
runoff	That portion of total rainfall that eventually enters a stream or river
SCCI	Acronym for Southeastern Cave Conservancy Inc.
SHPO	Acronym for State Historic Preservation Officer
SMZ(s)	Acronym for streamside management zone(s)
SNA(s)	Acronym for state natural area(s)
spp.	Abbreviation for species
SR(s)	Acronym for State Route(s)
ssp.	Abbreviation for subspecies
structure	A pole or tower that supports a transmission line
substation	A facility connected to a transmission line used to reduce voltage so that electric power may be delivered to a local power distributor or user
substation vs. switching station	A substation contains breakers, switches, and transformers that convert transmission voltage to lower voltages, usually to serve a customer or lower-voltage TVA lines. A switching station lacks transformers and usually contains only breakers and switches to change line connections or sectionalize lines. Both are fenced and usually have a gravel surface.
surface water	Water collecting on the ground or in a stream, river, lake, or wetland, which is naturally lost through evaporation and seepage into the groundwater
switch	A device used to complete or break an electrical connection

switch house	The building at a substation or switching station that houses equipment (such as relays, computer equipment, and communications equipment), which needs to be protected from the weather
tap point	A connection point between a tap line and an existing transmission line
threatened species	A species likely to become endangered within the foreseeable future
TDEC	Acronym for Tennessee Department of Environment and Conservation
transmission line	A series of electrical conductors (“wires”) and their supporting structures used to transmit electric power from one location to another
TVA	Acronym for Tennessee Valley Authority
TVARAM	Acronym for the TVA Rapid Assessment Method, a version of the Ohio Rapid Assessment Method designed specifically for the TVA region
TWRA	Acronym for Tennessee Wildlife Resources Agency
US	Acronym for U.S. Highway
USACE	Acronym for U.S. Army Corps of Engineers
USEPA	Acronym for U.S. Environmental Protection Agency
USFS	Acronym for U.S. Forest Service
USFWS	Acronym for U.S. Fish and Wildlife Service
USGS	Acronym for U.S. Geological Survey
wetland	A marsh, swamp, or other area of land where the soil near the surface is saturated or covered with water
WHO	Acronym for World Health Organization
WMA	Acronym for Wildlife Management Area
WWC(s)	Acronym for wet-weather conveyance(s)
XLPE	Acronym for cross-linked polyethylene