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**NORTH ALABAMA UTILITY-SCALE SOLAR FACILITY  
FINAL ENVIRONMENTAL IMPACT STATEMENT**  
Lawrence County, Alabama

**Prepared by:**  
TENNESSEE VALLEY AUTHORITY  
Knoxville, Tennessee

May 2022

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## COVER SHEET

### North Alabama Utility-Scale Solar Facility Environmental Impact Statement

**Proposed action:** Under the Proposed Action, the Tennessee Valley Authority (TVA) would construct, interconnect, sign a 20-year power purchase agreement (PPA) for the operation and maintenance, and eventual decommissioning of a proposed 200-megawatt (MW) alternating current (AC) solar photovoltaic (PV) facility occupying about 1,459 acres of a 2,896-acre Project Site currently owned by TVA, two miles east of Courtland, in Lawrence County, Alabama.

**Type of document:** Final Environmental Impact Statement

**Lead agency:** Tennessee Valley Authority

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**Abstract:**

In order to meet the demand for increased renewable generation, TVA proposes to construct the approximately 200-MW AC North Alabama Utility-Scale Solar Facility, a PV generating facility located two miles east of Courtland in Lawrence County, Alabama. The facility would occupy approximately 1,459 acres of a 2,896-acre Project Site owned by TVA that is currently predominantly farmland. Associated actions include the construction of an electrical substation and possibly a battery energy storage system on the Project Site and the interconnection of the facility to an existing TVA transmission line that extends through the site. TVA would construct the facility with the intent of entering into a PPA with a qualified company to own, maintain, and operate the facility for up to a 20-year period. This EIS evaluates the environmental impacts of the proposed action, i.e., the construction and operation of the North Alabama Utility-Scale Solar Facility, and the No Action Alternative, under which TVA would not develop the facility and would meet renewable energy demand through other actions.



## SUMMARY

### Purpose and Need for Action

In June 2019, the Tennessee Valley Authority (TVA) completed an Integrated Resource Plan (IRP) and associated Environmental Impact Statement (EIS) to determine how TVA will meet the demand for electricity in its service territory over the next 20 years, while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts (TVA 2019a). The 2019 IRP recommends the expansion of solar generating capacity of up to 14 gigawatts by 2038, depending on the level of load growth and other factors. TVA proposes to construct the first large (greater than one megawatt [MW] alternating current [AC] capacity) TVA-developed solar photovoltaic (PV) facility, the North Alabama Utility-Scale Solar Facility, to help fulfill the renewable energy goals established in the 2019 IRP.

### Alternatives

In this EIS, TVA assesses a No Action Alternative and a Proposed Action Alternative. Under the Proposed Action Alternative, TVA would construct an approximately 200-MW AC solar PV facility, including an electrical substation and possibly a battery energy storage system, on an approximately 1,459-acre portion of the TVA-owned Project Site. An additional 150 acres of the Project Site would be maintained as species-rich native plant meadow. The Project would connect to the existing adjacent Reservation–Mountain Home 161-kilovolt (kV) transmission line (TL) that crosses the Project Site. TVA would develop the Project Site with the intent of entering into a power purchase agreement (PPA) with a qualified company to own, maintain, and operate the facility for up to a 20-year period. At the end of the PPA term, TVA would repurchase the facility and either let the PPA expire and decommission the facility or as evaluated under separate environmental review, enter into a new PPA or choose to operate the solar PV facility for an additional time period.

Under the No Action Alternative, TVA would not develop a solar PV facility at this location and would pursue other actions to meet its renewable energy goals.

### Affected Environment

The proposed North Alabama Utility-Scale Solar Facility would be located in Lawrence County in northern Alabama, along U.S. Highway 72 Alternate (US 72A) approximately two miles east of the town of Courtland. The character of the project area is mostly rural, with croplands, pasturelands, and forested areas dominating. The topography is generally flat to gently rolling terrain, with elevation generally decreasing to the north toward the Tennessee River. Several rural-residential concentrations, as well as a few small to midsized towns and cities are within two to 20 miles of the Project Site. Several local, state, and federal roads provide access to the Project Site.

Current land use on the Project Site is agricultural, primarily cultivated crops, pasturelands, and forested areas that are regularly harvested. Ponds, wetlands, three named streams (Wheeler Branch, Red Branch, and Swoope Branch), and numerous unnamed streams associated with three watersheds are present on the Project Site. These habitats support a variety of terrestrial and aquatic species. Approximately 90 percent of the Project Site is composed of soils designated as prime farmland or farmland of statewide importance.

The Project Site vicinity is culturally and historically important for its pre-contact habitations along or near the Tennessee River and its associations with the Deas and Whiteley route of the Cherokee Trail of Tears and the Civil War, the tenant farm occupations associated with Wheeler

Station, and the changes that occurred in the 1930s related to TVA's hydroelectric efforts on the Tennessee River. National Register of Historic Places-eligible or undetermined cultural resources on the Project Site consist of six pre-contact period archaeological sites, two potentially sensitive cultural resource areas (a cemetery and two locations potentially associated with Native Americans), ten historical period archaeological sites, and one cemetery. Three historic or potentially historic buildings are adjacent to the Project Site. These buildings, along with historical archaeological and other historical architectural resources, are encompassed within the proposed 4,275-acre Wheeler Station Rural Historic District (WSRHD), with a period of significance between 1818 and 1955. Other buildings in the vicinity of the Project include rural-residential, agricultural, and commercial buildings. Two churches are present immediately adjacent to the Project Site along US 72A, which bisects the Project Site.

TVA's existing Reservation–Mountain Home 161-kV TL crosses the central portion of the Project Site. A 7.9-mile-long portion of this TL would be modified to accommodate its interconnection with the solar facility. One confirmed population of the federally endangered plant fleshy-fruit gladeceess occur along this portion of the TL, where the right-of-way (ROW) has been maintained as low-growing herbaceous vegetation.

## **Environmental Consequences**

Overall, environmental consequences associated with the Proposed Action Alternative would not be significant and, for the most part, would be temporary with the implementation of minimization and mitigation efforts. During construction, minor, temporary increases to noise, traffic, and health and safety risks, as well as minor, temporary effects to air quality, greenhouse gas emissions, visual aesthetics, and utilities would occur. Construction and operations would have minor, localized effects on soil erosion and sedimentation and minor, direct and indirect effects to surface waters and wetlands, floodplains, and aquatic life. These impacts would be minimized or mitigated by implementation of best management practices (BMPs) and specific measures designed to mitigate effects, such as establishment and maintenance of species-rich native plant meadow on up to 150 acres of the Project Site. Beneficial effects on socioeconomics would also occur with construction and operation of the Project.

Permanent fill for a road crossing would impact one linear wetland on the Project Site. This impact would be subject to Clean Water Act Section 404 and 401 permitting through the U.S. Army Corps of Engineers and the Alabama Department of Environmental Management, respectively. The Project would change land uses on the Project Site from primarily agricultural to industrial. Long-term habitat loss would also occur as a result of this change in land use.

Approximately 84 acres of forest that potentially provides summer roosting habitat for endangered and threatened bats would be cleared during winter months, when bats are not likely to be present on the Project Site. The TL upgrade work would be carried out in a manner to avoid impacts to the endangered fleshy-fruit gladeceess. TVA has consulted with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act, and USFWS concurred with TVA's determination that the Project may affect but is not likely to adversely affect federally listed species.

The proposed action would avoid the cemetery, all 16 archaeological sites determined NRHP-eligible, and the two potentially sensitive cultural resources areas of undetermined NRHP eligibility. The Project would have visual effects to the three NRHP-listed or eligible architectural resources; however, the effects would not be adverse due to modern intrusions and/or setbacks from these resources that would be maintained by the Project. Maintenance of these setbacks would also help minimize the overall visual effects of the proposed action. The proposed undertaking would alter the historic characteristics that qualify the proposed rural landscape district, WSRHD, for the NRHP by diminishing its integrity of design, setting, materials, workmanship, feeling, and association. TVA consulted with the Alabama Historical Commission (AHC) and federally recognized Indian tribes under Section 106 of the National Historic Preservation Act (NHPA) regarding these findings and avoidance and minimization measures. TVA and AHC developed an NHPA Section 106 memorandum of agreement to mitigate effects to WSRHD to which the Project would adhere.



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## SYMBOLS, ACRONYMS, AND ABBREVIATIONS

AADT	Annual average daily traffic
AC	Alternating current
ACS	American Community Survey
ADEM	Alabama Department of Environmental Management
AHC	Alabama Historical Commission
ALDOT	Alabama Department of Transportation
APE	Area of potential effect
APHIS	Animal and Plant Health Inspection Service
BESS	Battery energy storage system
BMP	Best management practice
CBMPP	Construction Best Management Practices Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO <sub>2</sub>	Carbon dioxide
CO	Carbon monoxide
CR	County road
CT	Census Tract
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
DBH	Diameter at breast height
DC	Direct current
DNL	Day-night average sound level
EDPA	Economic Development Partnership of Alabama
EIS	Environmental impact statement
EMF	Electromagnetic fields
EO	Executive Order
ESA	Endangered Species Act
°F	Degree Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
GHG	Greenhouse gas
GSA	Geological Survey of Alabama
HUC	Hydrologic Unit Code
IPaC	Information for Planning and Conservation
IRP	Integrated Resource Plan
JWEMC	Joe Wheeler Electric Membership Cooperative
kV	Kilovolt
LF	Linear feet
MPT	Main power transformer
MWh	Megawatt hour
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NARCOG	North Central Alabama Regional Council of Governments
NEI	National Emission Inventory
NEPA	National Environmental Policy Act

NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NRHP	National Register of Historic Places
NO <sub>x</sub>	Nitrogen oxides
NOI	Notice of Intent
NP	Nuclear Plant
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetland Inventory
NWP	Nationwide Permit
OHGW	Overhead ground wire
OPGW	Fiber-optic overhead ground wire
OSHA	Occupational Safety and Health Administration
PGA	Peak ground acceleration
PM <sub>2.5</sub>	Particulate matter whose particles are less than or equal to 2.5 micrometers
PM <sub>10</sub>	Particulate matter whose particles are less than or equal to 10 micrometers
PPA	Power purchase agreement
PPE	Personal protective equipment
PV	Photovoltaic
RNHD	Regional Natural Heritage Database
RCRA	Resource Conservation and Recovery Act
RFFA	Reasonably foreseeable future action
ROD	Record of Decision
ROW	Right-of-way
SHPO	State historic preservation officer
SO <sub>2</sub>	Sulfur dioxide
SPCC	Spill Prevention, Countermeasure and Control
SR	State route
TL	Transmission line
TVA	Tennessee Valley Authority
TVAR	Tennessee Valley Archaeological Research
TVARAM	TVA Rapid Assessment Method
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WQC	Water quality certification
WMA	Wildlife Management Area
WMEL	West Morgan – East Lawrence Water and Sewer Authority
WSRHD	Wheeler Station Rural Historic District

## CHAPTER 1 – PURPOSE AND NEED FOR ACTION

As part of its diversified energy strategy, the Tennessee Valley Authority (TVA) produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. In June 2019, TVA completed an Integrated Resource Plan (IRP) and associated Environmental Impact Statement (EIS). The 2019 IRP, which updated the 2015 IRP, identified the various resources that TVA intends to use to meet the energy needs of the TVA region over a 20-year planning period, while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts (TVA 2019a). The 2019 IRP recommends the expansion of solar generating capacity of up to 14,000 megawatts (MW) by 2038.

TVA proposes to construct a solar photovoltaic (PV) facility with a generating capacity of approximately 200 MW alternating current (AC) including an electrical substation and possibly a battery energy storage system and enter into a power purchase agreement (PPA) with a private operator for its operations and maintenance. The Project would partially fulfill the renewable energy goals established in the 2019 IRP by providing cost-effective renewable energy. This EIS describes the potential environmental effects associated with constructing, interconnecting, operating, maintaining, and decommissioning the North Alabama Utility-Scale Solar Facility (Project) on a 2,896-acre Project Site in Lawrence County, Alabama.

### 1.1 Background and Introduction

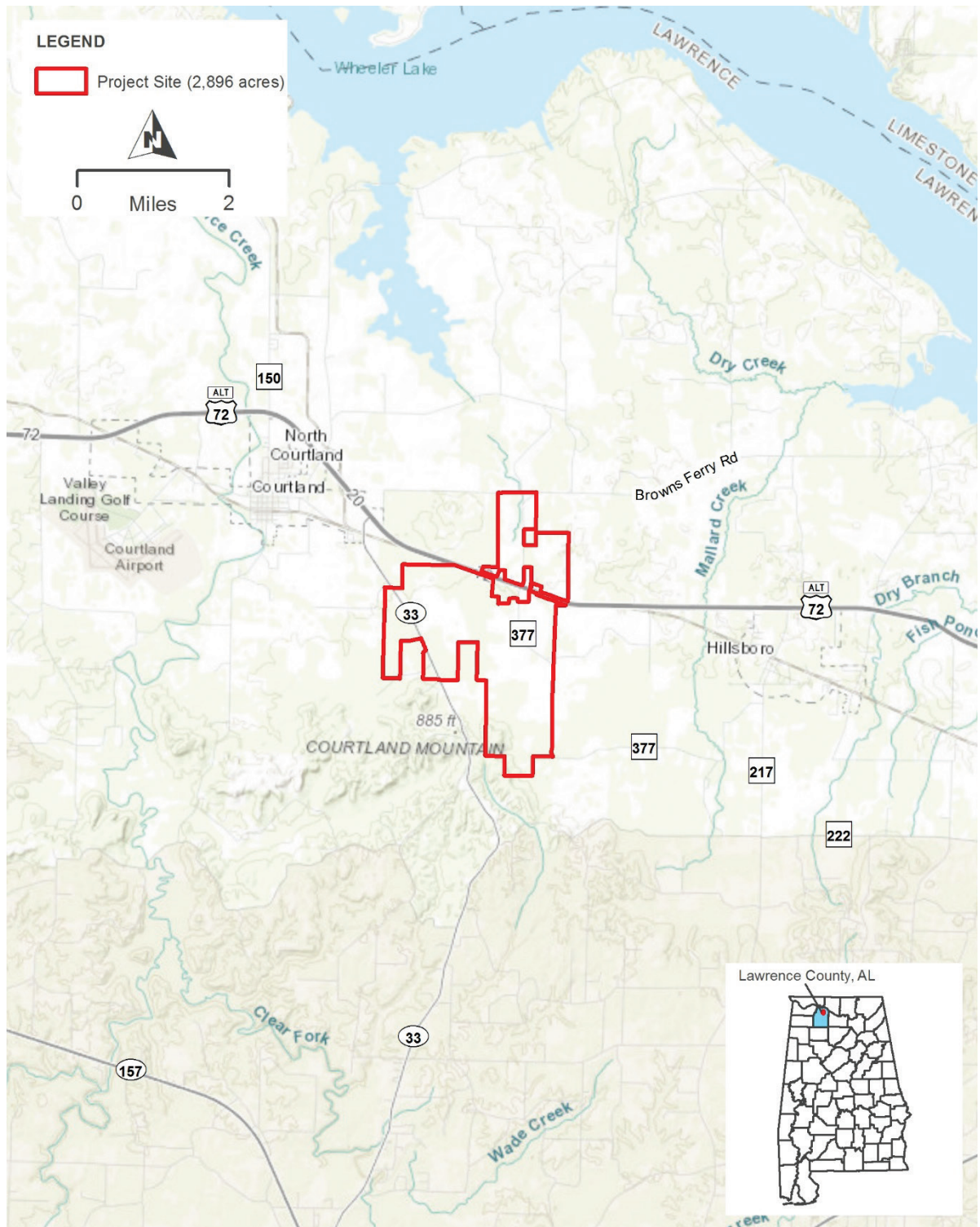
TVA is a self-financed, wholly owned corporate agency of the United States (U.S. or US) that serves a region comprising portions of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia. As a public power entity, TVA has no shareholders and receives no appropriated funding. Under the TVA Act of 1933, as amended, Congress charged TVA with advancing the social and economic well-being of the residents of the Tennessee Valley region. TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. The IRP completed in 2019 is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. The target supply mix adopted by TVA in the 2019 IRP envisions the solar generating capacity additions of between 1,500 and 8,000 MW by 2028, and up to 14,000 MW by 2038, depending on load growth and other factors.

TVA entered into a two-year Purchase Option Agreement in October 2019 for the Project Site and purchased the property before expiration of the agreement in October 2021 to preserve the option of the Proposed Action Alternative in the ongoing environmental review. Since the property once acquired could be readily sold, TVA considers this land purchase to be an action that is reversible in the future, and TVA would not initiate Project-related actions on the Project Site unless the Proposed Action is selected with the issuance of the record of decision (ROD). TVA would either maintain the Project Site through periodic mowing and may enter into lease agreement(s) with local farmer(s) to continue agricultural operations. Components of the Proposed Action include the construction, operation, maintenance, and eventual decommissioning of the approximately 200-MW AC solar PV facility, known as the North Alabama Utility-Scale Solar Facility, on approximately 1,459 acres of the Project Site. TVA would also construct a 161-kilovolt (kV) substation, herein called the Project substation, and install network upgrades to the Reservation–Mountain

Home 161-kV transmission line (TL) in order to interconnect the solar PV facility to TVA's existing electrical transmission network. TVA may also install an approximately 200-MW hour (MWh) battery energy storage system (BESS) that would store energy produced by the Project. As an environmental mitigation measure, TVA would establish and maintain up to 150 acres of the Project Site as species-rich native plant meadow.

The Project Site is along U.S. Highway 72 Alternate (US 72A) approximately two miles east of the town of Courtland (Figure 1-1). The Project Site consists of two portions, a 576-acre northern portion north of US 72A and a 2,320-acre southern portion south of US 72A. The Project Site is primarily composed of croplands and forested areas surrounding waterbodies. Several rural-residential concentrations, as well as some historic sites are adjacent to or surrounded by the Project Site. Two TLs cross the southern portion of the Project Site.





**Figure 1-1. North Alabama Utility-Scale Solar Facility Project Site**

## 1.2 Decision to be Made

The decision before TVA is whether to implement the Proposed Action, which would result in the construction, operation, maintenance, and eventual decommissioning of the proposed solar PV facility, as well as the construction, operation, and maintenance of a substation and associated facilities to interconnect the solar PV facility to TVA's existing electrical transmission network. TVA is also considering constructing and operating an associated 200-MWh BESS.

## 1.3 Scoping and Public Involvement

After entering into the Purchase Option Agreement on the Project Site, TVA closely coordinated with the current landowner, individuals and organizations currently utilizing the property, and neighboring property owners. Neighbors to the Project Site received a letter regarding TVA's technical, environmental, and cultural evaluation of the Project Site for potential future use, emphasizing that the evaluation would involve the physical presence of TVA employees and contractors on the Project Site over an approximately two-year timespan. TVA initiated consultation with federally recognized tribes and the Alabama Historical Commission (AHC), which functions as the Alabama state historic preservation officer (SHPO), in December 2019 (Appendix A). Coordination with AHC and tribes was initiated early in the planning process due to the proximity of three properties eligible for or listed on the NRHP.

On January 30, 2020, TVA published a Notice of Intent (NOI) in the *Federal Register* announcing the preparation of this EIS (Appendix B). The NOI initiated a 30-day public scoping period which concluded on March 2, 2020. The NOI solicited public input on the scope of the EIS, including alternative actions and environmental issues that should be considered in the EIS.

In addition to the NOI in the *Federal Register*, TVA sent notification of the NOI to local and state government entities and federal agencies; issued a Project news release via local media serving the Lawrence County area, including WALW-FM radio, *The Moulton Advertiser*, *Times Daily*, *Decatur Daily*, *Huntsville Real-Time News* (AL.com), and the *News Courier*; and posted the news release on the TVA website (Appendix B). TVA sent the scoping notice via email to agencies and organizations.

During the scoping period, TVA received comments from the U.S. Geological Survey (USGS), the National Park Service, and six private individuals. Comments about the EIS process addressed alternatives, land use, prime farmland, water resources, biological resources, greenhouse gas (GHG) emissions, cultural resources, and cumulative effects. During the 45-day public review and comment period of the Draft EIS from January to March 2021, a total of 15 comments were received from the U.S. Environmental Protection Agency (USEPA), the National Park Service, and 13 private individuals. Parts of this EIS have been revised in response to the comments, and all comments submitted on the Draft EIS, as well as TVA's responses to those comments, are included in Appendix B.

During the public comment period, on February 11, 2021, at 6 PM, TVA held a live virtual public meeting to describe the Project and address questions in a live question-and-answer session. A recording of the session was made available following the meeting for public viewing. TVA also compiled frequently asked questions obtained during the public comment periods and the public meeting and posted a related fact sheet on the TVA environmental review webpage for the Project (TVA 2022).

The scope of this EIS covers impacts related to the construction, operation, maintenance, and decommissioning of the North Alabama Utility-Scale Solar Facility as well as the associated electrical substation, BESS, and modifications to the TVA electrical transmission network. This EIS (1) describes the existing environment in the project area, (2) analyzes potential environmental impacts associated with the No Action and Proposed Action alternatives, and (3) identifies and characterizes potential cumulative impacts that could result from the Project in relation to other ongoing or reasonably foreseeable proposed activities within and surrounding the Project Site. The “project area” is the potentially affected area within and beyond the Project Site and/or the TL upgrade locations and varies by each resource area.

Based on internal and public scoping, identification of applicable laws, regulations, executive orders (EOs), and policies, TVA identified the resource areas listed below as requiring review within the EIS:

- Land Use
- Geology, Soils, and Prime Farmland
- Groundwater/Water Supply
- Surface Water and Wetlands
- Floodplains
- Vegetation
- Wildlife
- Aquatic Life
- Threatened and Endangered Species
- Natural Areas, Parks, and Recreation
- Visual Resources
- Noise
- Air Quality and Greenhouse Gas Emissions
- Cultural Resources
- Utilities
- Waste Management
- Public Health and Safety
- Transportation
- Socioeconomics
- Environmental Justice

#### **1.4 Regulatory Compliance, Permits, and Agency Coordination**

This EIS is being prepared by TVA in accordance with the National Environmental Policy Act (NEPA; 42 U.S. Code [U.S.C.] §§ 4321 et seq.), the regulations implementing NEPA promulgated by the Council on Environmental Quality (CEQ; 40 Code of Federal Regulations [CFR] Parts 1500 to 1508), and TVA NEPA regulations and procedures. Because TVA began the preparation of this EIS before the Council on Environmental Quality (CEQ)’s revised NEPA regulations (85 FR 43304-43376, Jul. 16, 2020) took effect in September 2020, TVA is following the previously promulgated 1978 CEQ regulations in the preparation of this EIS.

Other laws and EOs are relevant to the Proposed Action (Table 1-1). These laws and orders may affect the environmental consequences of the solar PV facility and associated Project components or represent measures to implement during Project construction, operation, maintenance, and/or decommissioning. Each resource area discussion in Chapter 3 of this EIS describes the regulatory setting for the particular resource in more detail.

**Table 1-1. Laws and Executive Orders relevant to the Proposed Action**

<b>Environmental Resource Area</b>	<b>Law / Executive Order</b>
Geology, Soils, and Prime Farmland	Farmland Protection Policy Act
Water Resources	Clean Water Act EO 11988 – Floodplain Management EO 11990 – Protection of Wetlands Safe Drinking Water Act Administrative Code of Alabama Department of Environmental Management, Chapter 335-6
Biological Resources	Administrative Code of Alabama Department of Conservation and Natural Resources, Chapter 220-4 Bald and Golden Eagle Protection Act Endangered Species Act EO 13112 – Invasive Species EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds Migratory Bird Treaty Act
Air Quality and GHG Emissions	Clean Air Act Administrative Code of Alabama Department of Environmental Management, Chapter 335-3
Cultural Resources	National Historic Preservation Act Native American Graves Protection and Repatriation Act
Waste Management	Administrative Code of Alabama Department of Environmental Management, Chapter 335-13 and 14 Comprehensive Environmental Response, Compensation, and Liability Act Emergency Planning and Community Right-to-Know Act Resource Conservation and Recovery Act Solid Waste Disposal Act Toxic Substances Control Act
Public Health and Safety	Occupational Safety and Health Act
Environmental Justice	EO 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations

#### **1.4.1 National Pollutant Discharge Elimination System Permit**

An Alabama Department of Environmental Management (ADEM) General Construction Stormwater National Pollutant Discharge Elimination System (NPDES) permit (Permit ALR100000) would be required for the construction of the Project. The process involves completing an ADEM NOI form. If granted, Permit ALR100000 would authorize stormwater discharges associated with construction activities that result in a total land disturbance of one acre or greater, as governed by Section 402 of the Clean Water Act (CWA).

In accordance with Permit ALR100000, a site-specific Construction Best Management Practices Plan (CBMPP) would be developed for the Project and submitted to ADEM. The CBMPP would address all construction-related activities from the date construction commences to the date of termination of permit coverage. The CBMPP would be prepared in accordance with the requirements and recommendations contained in the *Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management on Construction Sites and Urban Areas* (ASWCC 2018).

#### **1.4.2 Clean Water Act Section 404 and 401 Permits**

Section 404 of the CWA prohibits the discharge of dredged or fill material into Waters of the U.S. (i.e., jurisdictional waters), including wetlands and streams unless approved by the U.S. Army Corps of Engineers (USACE). Impacts to jurisdictional waters that do not exceed 0.5 acre would be authorized under CWA Section 404 Nationwide Permits (NWP). NWPs are issued by USACE to allow the construction, expansion, or modification of certain activities that would discharge dredged or fill material into Waters of the U.S., provided the proposed activities meet specific criteria. Project impacts are expected to be either automatically authorized or permitted under NWPs Number 14, Linear Transportation Projects, and Number 57, Electric Utility Line and Telecommunications Activities, or Number 51, Land-Based Renewable Energy Generation Facilities. If the impacts exceed 0.5 acre, a Section 404 Individual Permit would be obtained.

Section 404 permits require a water quality certification (WQC), as set forth in Section 401 of the CWA, prior to discharging fill materials into Waters of the U.S. Section 401 requires any applicant requesting a federal permit or license for activities that may result in discharges to first obtain a certification from the state and that the permitted discharges comply with the state's applicable effluent limitations and water quality standards. In Alabama, ADEM is responsible for the issuance of WQCs, pursuant to the ADEM Administrative Code Chapter 335-6-10 (Water Quality Criteria). ADEM Form 166 8/19 (ADEM-COE Joint Application) would be completed to obtain a WQC for Project activities in Waters of the U.S.

#### **1.4.3 Other Permits**

The Alabama Department of Transportation (ALDOT) regulates the installation, adjustment, and relocation of utilities in state highway rights-of-way (ROWs) to ensure the integrity, safety, and functionality of state roadways while accommodating utilities. Per the ALDOT Utility Manual (Chapter 4, Permits and Agreements), a permit is required for additions to or upgrades of existing utility facilities, for installing new utilities, and for changes in voltage or pressure of existing utilities on state highway ROWs (ALDOT 2004).

Vegetative waste from clearing activities would be burned or chipped and ground. If open burning of debris from tree clearing on the site is planned, the activities would be in accordance with TVA's agreements with the U.S. Fish and Wildlife Service (USFWS) regarding federally threatened and endangered bat species, and the appropriate open

burning permits would be obtained from the Alabama Forestry Commission. Guidance on open or surface burning issued by ADEM would be followed. Only trees and brush from the Project Site would be burned. Weather conditions would be monitored and considered to ensure safety and minimize degradation to air quality during the open burning of any vegetation cleared from the site.

#### **1.4.4 Consultation Requirements**

In accordance with specific acts, TVA has consulted with federal and state agencies and federally recognized tribal governments on the effects of the Proposed Action on particular resource areas. Consultation correspondence is included in Appendix A.

##### **1.4.4.1 U.S. Fish and Wildlife Service**

In compliance with Section 7 of the Endangered Species Act (ESA), TVA initiated consultation with the USFWS on December 16, 2020, regarding the potential effects of the Proposed Action on species listed under the ESA based on survey of the Project Site, and sent a second correspondence on February 10, 2022, following survey of the TL upgrade locations. TVA determined that the Project may affect but is not likely to adversely affect the gray bat, northern long-eared bat, Indiana bat, and the fleshy-fruit gladeceess or its critical habitat with implementation of avoidance measures. USFWS concurred with the TVA determination in letters dated January 13, 2021, and February 25, 2022.

##### **1.4.4.2 Alabama Historical Commission**

In compliance with Section 106 of the National Historic Preservation Act (NHPA), TVA initiated consultation with AHC, which serves as the Alabama SHPO, regarding the Project and its effect on historic properties on December 19, 2019. Coordination with AHC was started early in the planning process due to the proximity of three historic properties and other known cultural resources to the Project Site. A meeting between TVA, AHC, and the cultural resources contractor conducting the Phase I cultural resources assessment for the Project occurred in December 2019. Subsequent communications with AHC occurred on August 28, 2020, October 2, 2020, May 14, 2021, and February 9, 2022, when TVA submitted the results of the cultural resources field surveys. AHC provided responses on November 9, 2020, June 29, 2021, and March 3, 2022.

In response to AHC coordination and comments and pursuant to 36 CFR § 800.6(c), TVA developed an NHPA Section 106 memorandum of agreement (MOA) regarding a newly recorded surrounding historic district, the Wheeler Station Rural Historic District (WSRHD). The MOA includes mitigation measures pertaining to effects to the historic district and was signed by TVA and AHC in November 2021. The Advisory Council on Historic Preservation was notified of the adverse effect determination and asked to be a consulting party but declined to participate.

##### **1.4.4.3 Federally Recognized Tribes**

In compliance with Section 106 of NHPA, TVA initiated consultation with federally recognized tribes regarding the Project and its effect on properties that may have religious and cultural significance to tribes on December 19, 2019. Section 5.2 lists the tribes that have been consulted to date. Consultation with tribes was initiated early in the planning process due to the proximity of potentially and known tribally significant properties to the Project Site.

The Chickasaw Nation responded in a letter dated March 9, 2020, indicating that the tribe was not aware of any historic properties of particular interest to the tribe. The Chickasaw

Nation also agreed that the proposed field methodology is adequate for identification of sites and requested to review the cultural resources survey report when available. Subsequent communications with tribes occurred on September 2, 2020, and October 5, 2020, when TVA provided the results of the architectural resource and archaeological resource field surveys, respectively.

On May 14, 2021, TVA sent tribes updated reports on the architectural and archaeological resources field survey results and to request participation in developing an MOA regarding adverse effects to surrounding historic properties. The Chickasaw Nation and Muscogee Nation responded in letters dated June 3, 2021, and June 18, 2021, respectively, that the tribes did not wish to participate in the development of the proposed MOA. TVA also provided tribes with the results of the addendum report on the archaeological resource field survey for the TL upgrade locations on February 9, 2022.

## **1.5 Environmental Impact Statement Overview**

NEPA requires federal agencies to consider the potential environmental consequences of their proposed actions as part of their decision-making process. Actions, in this context, can include new and continuing activities that are conducted, financed, assisted, regulated or approved by federal agencies, as well as new or revised plans, policies or procedures. The NEPA review process is intended to help federal agencies make decisions that are based on an understanding of a proposed action's impacts and, if necessary, to take steps that protect, restore, and enhance the environment (40 CFR 1500.1(c), 1978). NEPA also requires that federal agencies provide opportunities for public involvement in the decision-making process.

This EIS tiers from the TVA IRP EIS (TVA 2019a), which explains TVA's need for additional generating capacity and TVA's decision to meet much of this need with solar generation. The IRP EIS also compares the environmental impacts of solar generation with other types of generation and describes system-wide, non-site-specific impacts of solar generation.

TVA has prepared this EIS to assess the environmental impacts of the Proposed Action. TVA used the input received during the public scoping period and the 45-day Draft EIS public comment period, summarized above in Section 1.3, in developing this Final EIS. Notification of the availability of the Draft EIS was distributed to interested individuals; groups; and federal, state and local agencies for their review and comment (see Chapter 5). The completed Final EIS is available on TVA's website, and notices of its availability were sent to those who received the Draft EIS or submitted comments on the Draft EIS. TVA also sent the Final EIS to USEPA, which published a notice of its availability in the *Federal Register*. No sooner than 30 days after the notice of availability of the Final EIS, TVA will issue a ROD; the ROD will include (1) the decision; (2) the rationale for the decision; (3) alternatives that were considered; (4) identification of the environmentally preferable alternative; and (5) associated mitigation measures, monitoring, and enforcement requirements. The ROD will be published in the *Federal Register*.





## CHAPTER 2 - ALTERNATIVES

This chapter explains the rationale for identifying the alternatives to be evaluated, describes each alternative, provides a comparison of alternatives with respect to their potential environmental impacts, and identifies the Preferred Alternative.

Through preliminary scoping, TVA has determined that, from the standpoint of NEPA, there are two feasible alternatives available: the No Action Alternative and the Proposed Action Alternative. Other alternatives to the Proposed Action, such as other project sites that were considered but eliminated from further analysis, are discussed in Section 2.2.

### 2.1 No Action Alternative

The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative are measured. Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility at the Project Site and would pursue other actions to meet its renewable energy goals established in the 2019 IRP (TVA 2019a). TVA would retain ownership of the site until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would conduct necessary site maintenance, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. TVA may implement environmental enhancement measures by establishing and maintaining the proposed species-rich native plant meadow, as described in Section 2.2, and/or by expanding the suitable habitat for the state-listed Tuscumbia darter and the globally rare round-rib elimia, wherein TVA would thin the dense vegetative buffer along Wheeler Branch and maintain the thinned buffer, as described in Section 2.5. These interim activities would follow TVA's standard best management practices (BMPs; TVA 2017a) and permitting requirements, as described in Section 1.4 and Section 2.2.3.1. They would also align with TVA's natural resource management policies as described in its 2020 Natural Resource Plan and EIS (TVA 2020a). Agricultural lease agreements with farmers would adhere to TVA's standards listed in the Grasslands and Agricultural Lands Management License provisions (Appendix A).

### 2.2 Proposed Action Alternative

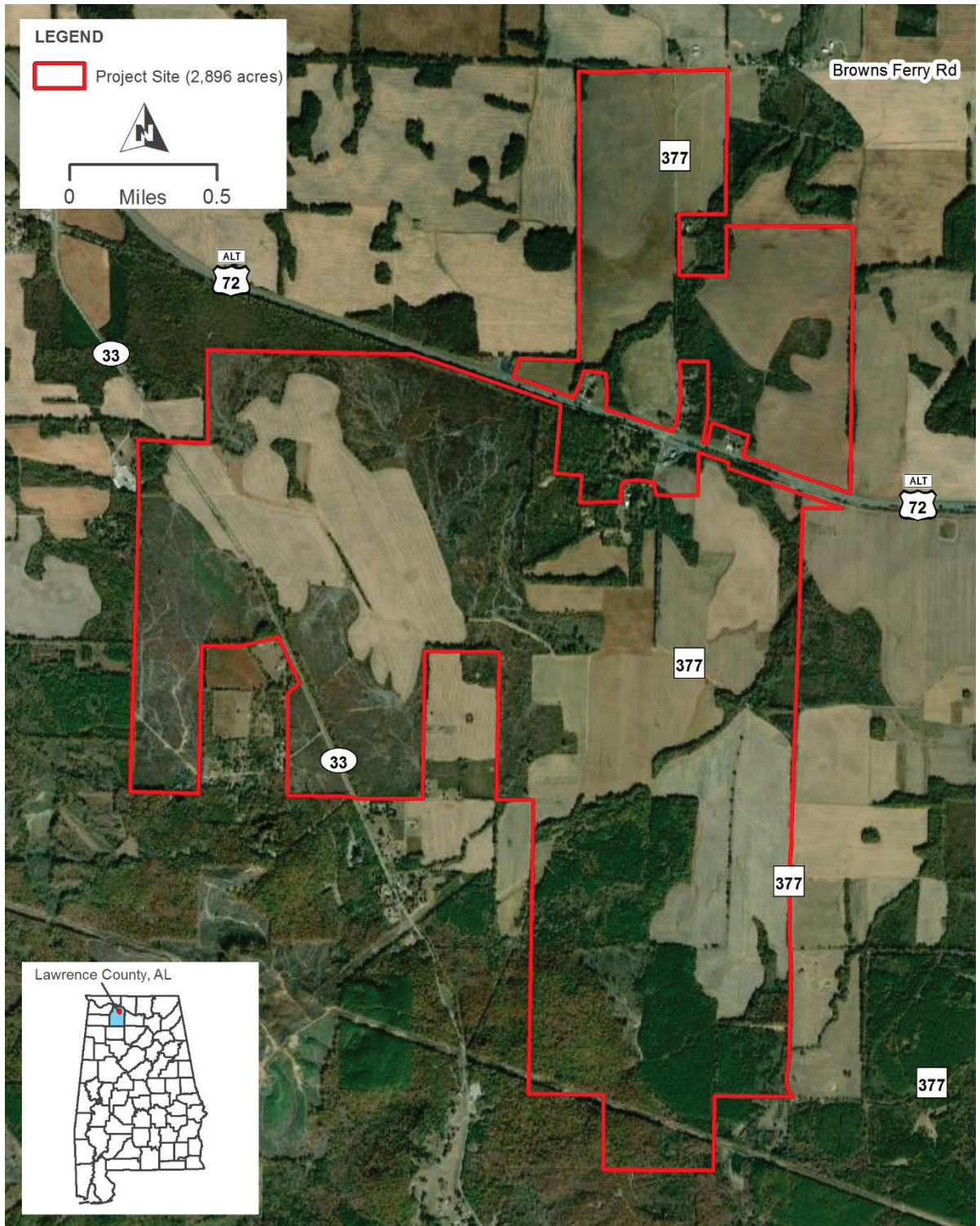
Under the Proposed Action Alternative, TVA would construct an approximately 200-MW AC solar PV facility known as the North Alabama Utility-Scale Solar Facility, including a substation and possibly a battery energy storage system (BESS). The solar PV facility, BESS, and associated 161-kV Project substation would occupy approximately 1,459 acres of a 2,896-acre Project Site located along US 72A approximately two miles east of the town of Courtland in northeastern Lawrence County, Alabama. The solar facility and associated components have been designed to avoid and minimize impacts to environmental resources to the maximum extent possible. An additional 150 acres of the Project Site would be maintained as species-rich native plant meadow. TVA would develop the facility with the intent of entering into a PPA with a qualified company to own, maintain, and operate it under terms of the PPA for up to a 20-year period. The PPA would include appropriate commitments and restrictive covenants for the protection of environmental resources. At the end of the PPA term, TVA would repurchase the facility and either let the PPA expire and decommission the facility or as evaluated under separate environmental review, enter into a new PPA or choose to operate the solar facility for an additional period. As part of the Proposed Action, TVA may also construct and operate a 200-MWh BESS

within the 1,459-acre developed portion of the Project Site, adjacent to the Project substation. The facility output would be transmitted to the TVA electrical network via an interconnection with the existing Reservation–Mountain Home 161-kV TL, which crosses the southern portion of the Project Site. The interconnection of the solar facility would require upgrades on this TL in Lawrence County.

### **2.2.1 Project Description**

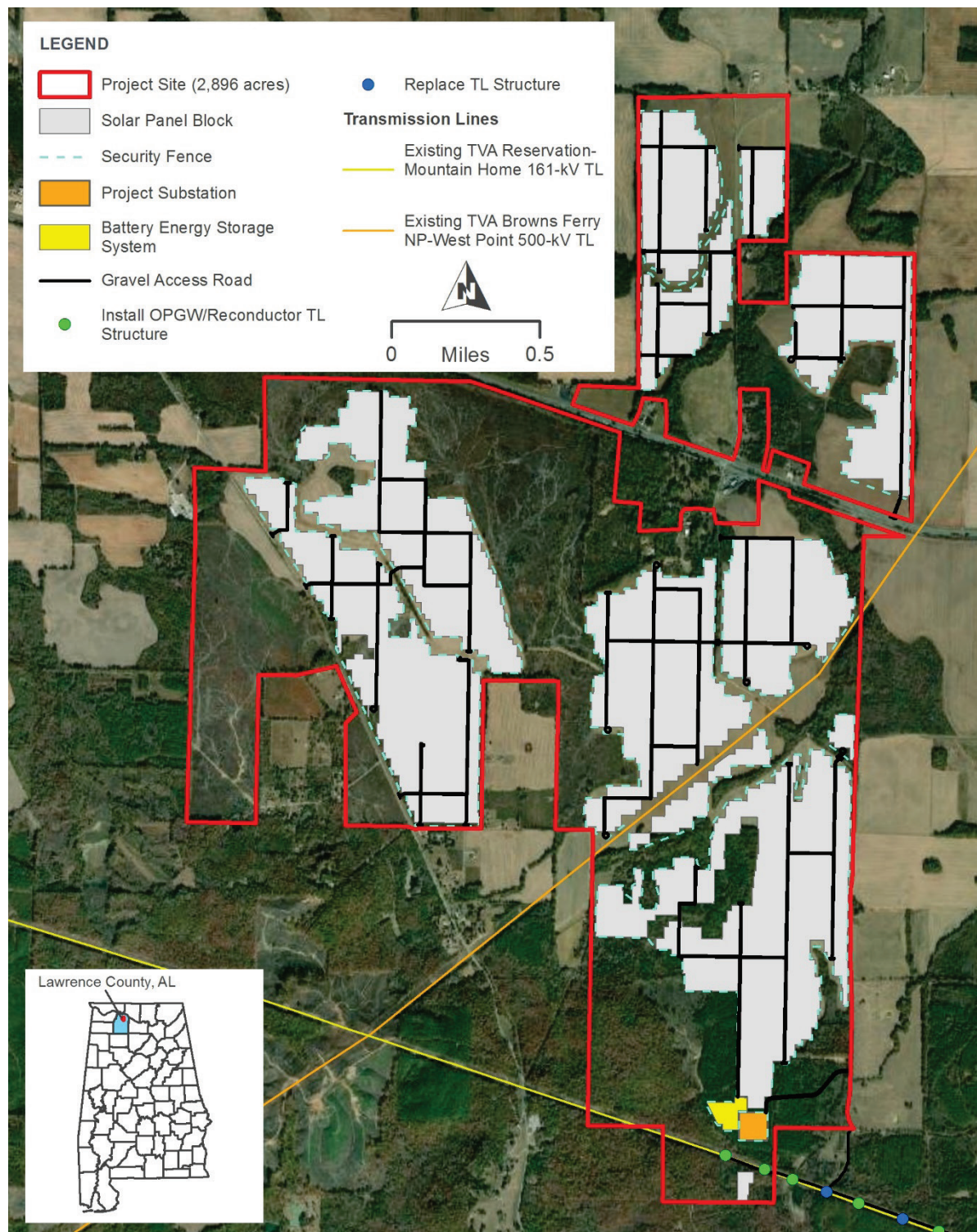
The North Alabama Utility-Scale Solar Facility and associated transmission interconnection components would occupy approximately 1,459 acres of the 2,896-acre Project Site (Figure 2-1). The Project Site consists of two portions, the 576-acre northern portion north of US 72A and the 2,320-acre southern portion south of US 72A. The northern portion of the Project Site surrounds the unincorporated community of Wheeler and is primarily cropland with portions of forested areas, generally along waterbodies. The southern portion of the Project Site, immediately south and southwest of the northern portion of the Project Site, is a combination of croplands and forested areas that have been recently timbered. Several residential complexes and individual residences are adjacent to or surrounded by the Project Site. Two TLs run through the southern portion of the Project Site (Figure 2-2 and Figure 2-3). State Route (SR) 33 crosses the western portion of Project Site south of US 72A, and County Road (CR) 377 extends along or near the eastern edge of the Project Site, both north and south of US 72A. The perimeter of the 1,459-acre developed solar PV facility, including the Project substation and the BESS, if constructed, would be enclosed by security fencing. The remaining 1,437 acres (49.6 percent) of the Project Site located outside of the fenced-in areas would remain undeveloped apart from the establishment and maintenance of 150 acres of species-rich meadow, selective forest thinning, and access roads.

The proposed Project substation, located on approximately 5.7 acres in the southern portion of the Project Site, would connect with the adjacent existing Reservation–Mountain Home 161-kV TL. A 7.6-mile length of the Reservation–Mountain Home 161-kV TL and particular TL structures would be modified.

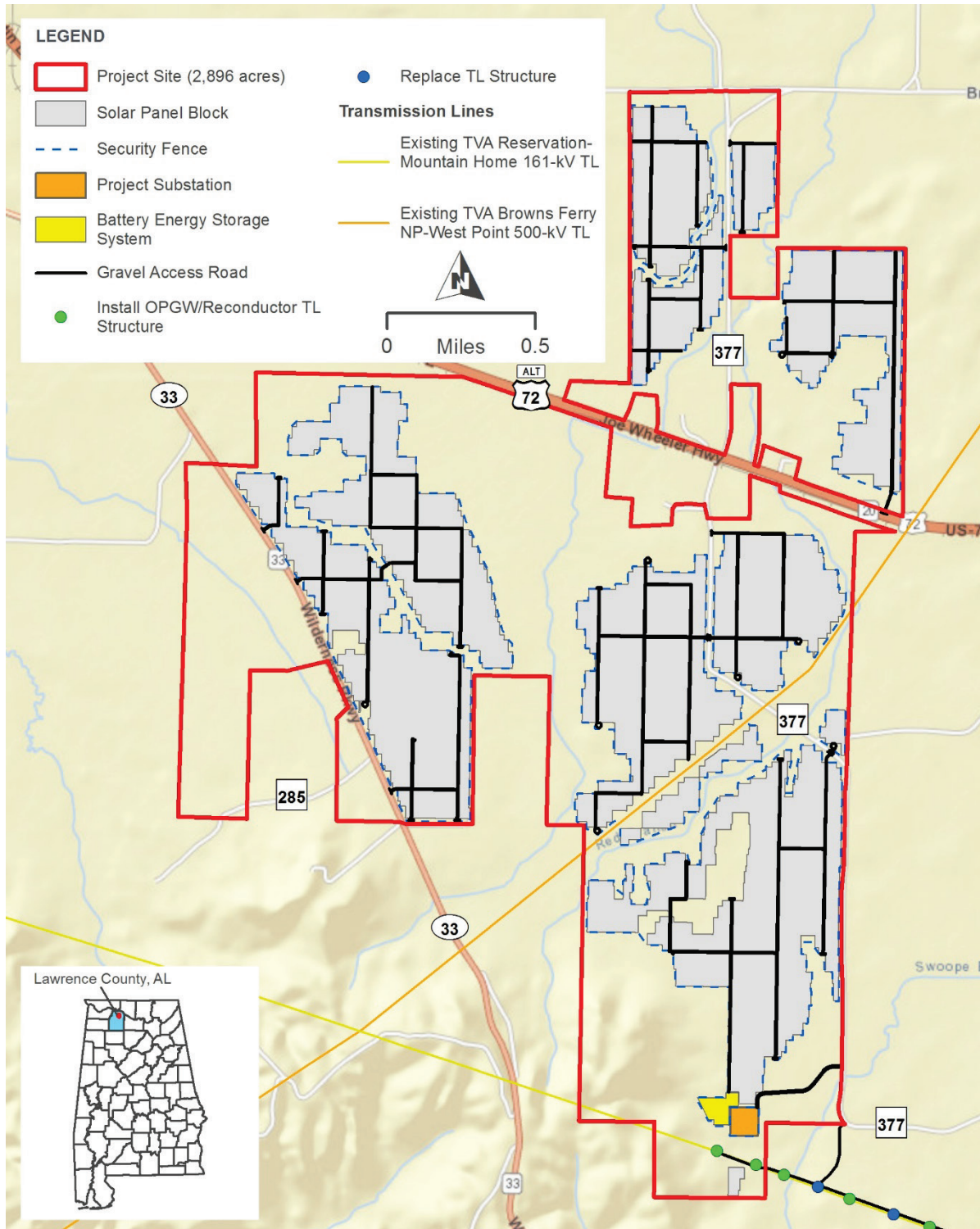


**Figure 2-1. Aerial photo showing the 2,896-acre Project Site**





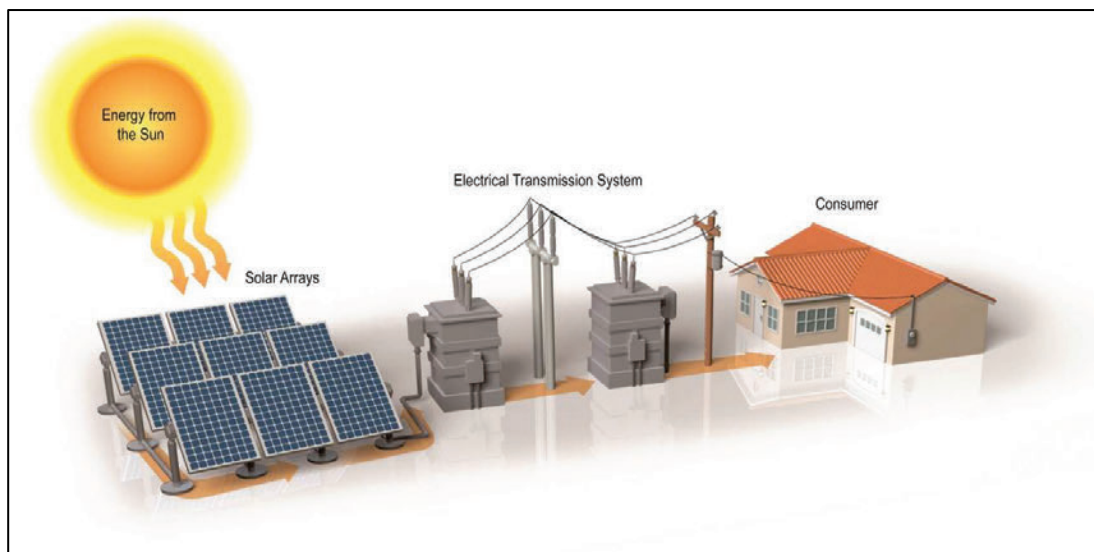
**Figure 2-2. Aerial photo showing the preliminary layout of the North Alabama Utility-Scale Solar Facility components**



**Figure 2-3. Street map showing the preliminary layout of the North Alabama Utility-Scale Solar Facility components**



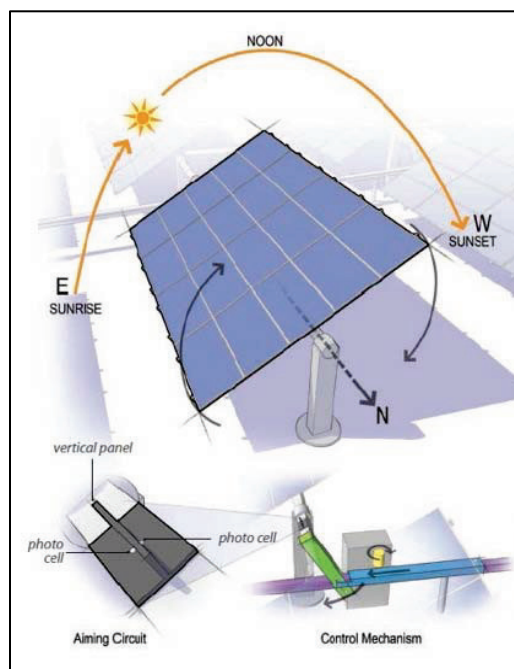
The North Alabama Utility-Scale Solar Facility would convert sunlight into direct current (DC) electrical energy within PV panels (modules) (Figure 2-4). PV power generation is the direct conversion of light into electricity at the atomic level. Some materials exhibit a property known as the photoelectric effect that causes them to absorb photons of light and release electrons. When these free electrons are captured, an electric current is produced, which can be used as electricity (TVA 2014).



**Figure 2-4. General energy flow diagram of PV solar system (not to scale)**

The Project would be composed of PV modules mounted together in arrays. Groups of panels would be connected electrically in series to form “strings” of panels, with the maximum string size chosen to ensure that the maximum inverter input voltage is not exceeded by the string voltage at the Project Site’s high design temperature. The panels, likely to be approximately 6.6 feet by 3.4 feet, would be located in individual blocks consisting of the PV arrays and an inverter station on a concrete pad or steel piles, to convert the DC electricity generated by the solar panels into AC electricity. The solar PV facility would be enclosed by chain-link security fencing. The portions of the Project Site outside the fenced-in area would not be developed apart from the establishment of 150 acres of species-rich meadow, selective forest thinning, and access roads.

The modules would be attached to metal racks configured as single-axis tracking systems (“single-axis trackers”). The single-axis trackers are designed to pivot the panels along their north-south axes to follow the path of the sun from the east to the west across the sky (Figure 2-5) and would be attached to steel pile foundations driven into the ground.



**Figure 2-5. Diagram of single-axis tracking system(not to scale)**

Collections of strings of panels would be connected by either underground or aboveground DC cabling to central inverters, which would convert DC electricity from PV panels into AC for transmission to the electrical network. The inverter specification would fully comply with the applicable requirements of the National Electrical Code and Institute of Electrical and Electronics Engineers standards. Each of the approximately 87 inverters would be collocated with a mid-voltage transformer (MVT), which would step-up the AC voltage to minimize the AC cabling electrical losses between the central inverters and the proposed on-site Project substation. Underground AC power cables would connect all of the MVTs to the main power transformer (MPT) located within the substation.

TVA is considering the construction and operation of a BESS that would occupy an approximately six-acre area adjacent to and connected to the Project substation. If constructed, the BESS would have an estimated rated power capacity of 50 MW and a storage duration of four hours, for a total storage capacity of 200 MWh. The multiple battery containers and inverter and transformer skids associated with the BESS would be installed on concrete pads, and gravel would cover the remainder of the BESS location.

Other temporary or permanent Project components would include construction laydown areas and security and communications equipment. Compacted gravel access roads would provide access to each inverter block and the substation. Figure 2-2 and Figure 2-3 show the Project Site with major Project elements and the arrangement of the PV arrays. The arrangement within the 1,459-acre area may change slightly as additional engineering studies are completed.

### **2.2.2 Solar Facility Construction**

The solar facility site would be prepared by surveying and staking, grading/clearing, installation of security fencing around the solar facility, erosion prevention and sediment control BMPs, and preparation of construction laydown areas prior to solar array assembly and construction of the solar facility. During construction, water would be used for soil compaction and dust control as needed. Water in sufficient quantity and quality would be made available by connection to a municipal source or by delivery via water trucks. Portable toilets serviced by a licensed company would be provided for construction-related sewer service needs.

The 1,459 acres proposed for development of the North Alabama Utility-Scale Solar Facility would be cleared of tall vegetation to prevent shading of the solar panels and graded, as needed, for construction and placement of the solar panels, gravel access roads, the Project substation, the potential BESS, accompanying electrical components, and other Project components. Clearing of trees and other tall vegetation would be accomplished with chain saws, skidders, bulldozers, tractors, and/or low ground-pressure feller-bunchers, as appropriate to the terrain or constraints such as avoidance buffers for Waters of the U.S., where any clearing or thinning should be accomplished through non-mechanical means, as described in more detail below. Because the area to be cleared is primarily open agricultural land, minimal vegetative waste would accumulate during site preparation. Any vegetative waste that does accumulate on site would be disposed offsite or by open burning or chipping and grinding to minimize construction wastes. If burning is selected, only vegetation and untreated wood would be burned, and no burning of other construction debris is anticipated. Prior to burning, TVA would obtain any necessary permits, as discussed in Section 1.4.3. A silo and a hunting stand would be demolished for construction of the Project.

The construction contractor would work with the existing landscape (e.g., slope, drainage, utilization of existing roads) where feasible and minimize or eliminate grading work to the greatest extent possible. Approximately 19.1 acres would be graded with earthmoving equipment to achieve a suitable consistent slope. Prior to any major grading, efforts would be made to preserve native topsoil, which would be removed from the area to be graded and stockpiled on site for redistribution over the disturbed area after the grading is completed. Silt fences, sediment traps, and other appropriate controls would be used in accordance with the CBMPP to minimize exposure of soil and to prevent eroded soil from leaving the work area. Disturbed areas would be seeded after construction using a mixture of certified weed-free, low-growing, native and/or non-invasive grass and herbaceous plant seed obtained from a reputable seed dealer. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the preconstruction conditions or the site is stable.

TVA would also establish and manage up to 150 acres of the Project Site as species-rich meadow. These restoration zones would be situated in areas surrounding or adjacent to the solar arrays that currently support croplands or in areas where trees were recently harvested and would avoid impacts to environmental resources. One of the areas being considered is adjacent to Wheeler Branch, where a dense stream buffer would be thinned for conservation efforts associated with state-listed and globally rare aquatic species. No forested land would be cleared to create the meadow zones. In areas that are currently in agricultural production, restoration sites would likely be seeded with native grasses and wildflowers using a seed drill or planter. Broadcast seeding methods would likely be employed in recently harvested areas. Sites would be maintained with a combination of annual winter mowing, periodic selective application of herbicide to woody species, and prescribed fire, where appropriately distant from solar arrays and other project components. Meadow establishment in recently timbered areas would rely on prescribed fire to encourage native wildflowers and grasses. Seeding and selective use of herbicide in these fire-managed areas could be used to increase species diversity and control non-native weeds, respectively.

In accordance with TVA and ADEM requirements, 50-foot buffers surrounding jurisdictional wetlands and perennial and intermittent streams would be established as an avoidance measure prior to any clearing, grubbing, grading, or boring activities. Apart from removal of tall vegetation through non-mechanical means and leaving the roots in place, buffer areas would be avoided during construction to the greatest extent practicable. Once the buffer areas are established, construction areas would be cleared and mowed of vegetation and miscellaneous debris. Mowing would continue as needed to contain regrowth during construction.

To manage stormwater during construction, on-site temporary sedimentation basins, sediment traps, or diversion berms and potentially some permanent sedimentation basins (likely near the Project substation and BESS) would be constructed within the 1,459-acre disturbed area of the Project Site. If needed, a diversion berm would be constructed along portions of the Project Site perimeter to contain stormwater on site. Any necessary sedimentation basins and traps would be compliant with ADEM requirements. If necessary, sedimentation basins and traps would be constructed either by impoundment of natural depressions or by excavating the existing soil. The floor and embankments of the basins would be allowed to naturally revegetate after construction or replanted as necessary to provide natural stabilization and minimize subsequent erosion. All potentially impacted buffered streams and wetlands would be protected by erosion control silt fences. Sediment



traps would be placed in strategic drainage areas to prevent sediment from entering on-site streams and wetlands. Offsite sediment migration would be minimized by the placement of silt fences and other stormwater BMPs around each area of ground disturbance within the Project Site. These stormwater BMPs would prevent sediment from entering on-site streams and wetlands and prevent sediment migration off site during construction prior to achievement of final vegetative stabilization. All erosion and sediment controls would be detailed in the site specific CBMPP.

Approximately 20 acres of the overall 1,459-acre disturbed area of the Project Site would be used as construction assembly areas (also called laydown areas) for worker assembly, safety briefings, vehicle parking, and material storage during construction. The laydown areas would likely be graveled. Some of these areas may be staged within the locations proposed for the PV arrays. Temporary construction trailers for material storage and office space would be parked on site. Following completion of construction activities, trailers, and any remaining unused materials and construction debris would be removed from the Project Site.

Construction activities would be sequenced to minimize the time that bare soil in disturbed areas is exposed. In addition to the silt fencing described above, other appropriate controls, such as temporary cover, would be used as needed to minimize exposure of soil and to prevent eroded soil from leaving the work area. Disturbed areas, including road shoulders, construction office and laydown areas, ditches, and other Project-specific locations, would be seeded or otherwise stabilized post-construction. If conditions require, soil may be further stabilized by mulch or sprayable fiber mat or other equivalent measures. If the area seeded is a steep slope (6:1 or greater), hydroseeding may be employed as an alternative measure. Where required, hay mulch would be applied and well distributed over the area. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the preconstruction conditions or the site is stable. As part of NPDES permit authorization (see Section 1.4.1), the site-specific CBMPP would be finalized with the final grading and civil design and would address all construction-related activities prior to construction commencement.

The design of the tracker support structures could vary depending on the final PV technology and vendor selected. Based on preliminary geotechnical survey results for the Project Site, the trackers would likely be attached to driven steel pile foundations. The steel pile foundations are typically galvanized and used where high load bearing capacities are required. The pile is driven with a hydraulic ram. Soil disturbance is restricted to the pile insertion location to a depth typically less than 20-feet below grade; there is also potential for temporary soil disturbance from the hydraulic ram machinery, which is about the size of a small tractor. Screw piles are another option for PV foundations which are drilled into the ground with a truck-mounted auger. Screw piles create a similar soil disturbance footprint as driven piles. PV foundation installation activities are expected to occur for a six- to 12-month period during construction. The tracker design and pile foundation design would be approved by a registered Professional Engineer and Structural Engineer, respectively.

Solar panels would be manufactured off site and shipped to the Project Site ready for installation. Electricians and assistants would run the AC collection cables underground throughout the solar facility. The trenches to hold the cabling would be three- to four-feet deep and one- to four-feet wide. The trenches would be backfilled with the excavated soil and then appropriately compacted. If necessary, AC collection cables would be installed by boring under jurisdictional streams and wetlands.

The MPT would be supported on a concrete foundation within the 5.7-acre substation location, discussed in more detail in Section 2.2.3.2. An underground or aboveground transmission cable would be constructed to connect the MPT through a circuit breaker. After the equipment is electrically connected, electrical service would be tested, motors would be checked, and control logic would be verified. As the solar arrays are installed, the balance of the facility would continue to be constructed and installed, and the instrumentation would be installed. Once all the individual systems have been tested, integrated testing of the Project would occur. Electrical interconnection details are provided in Section 2.2.3.

The perimeter of the North Alabama Utility-Scale Solar Facility would be enclosed during construction and for the duration of the Project operation by six-foot-tall chain-link fencing topped with three strands of barbed wire. Access to the solar facility would be provided by double-swing gates and 15-foot-wide access roads. The Project Site would be accessible only to TVA, the entity with the PPA, and their agents and contractors.

Construction activities would take approximately 24 to 36 months to complete using a crew that ranges from 150 to 500 workers. Work would generally occur during daylight hours for five to seven days a week. Night-time construction could be necessary to make up schedule deficiencies or to complete critical construction activities. Night-time construction, if determined necessary, would require temporary lighting. Any permanent night-time lighting installed during the construction phase, which would likely be necessary at the Project substation and BESS locations, would be fully shielded and/or low glare to minimize impacts to surrounding areas, as discussed in more detail in Section 2.2.3.

### **2.2.3 Electrical Interconnection**

Under the Proposed Action, TVA would construct the Project substation near the southern boundary of the Project Site, adjacent to TVA's existing Reservation–Mountain Home 161-kV TL (L5148). Network upgrades to portions of L5148 would also be completed for the Project, as illustrated in Figure 2-6. Based on the analyses conducted to date, the transmission system upgrades associated with the interconnection of the solar PV facility to TVA's existing electrical transmission network would include substation construction; line, structure, and/or access road changes; and other transmission system modifications, as described below.



**Figure 2-6. The proposed Project substation, battery energy storage system, and work areas along the existing TVA Reservation-Mountain Home 161-kV TL**

### **2.2.3.1 Transmission Best Management Practices**

TVA utilizes standard practices for transmission and interconnection-related construction activities. These guidance and specification documents are considered when assessing the effects of the Proposed Action and include:

- *TVA Environmental Quality Protection Specifications for Transmission Line Construction,*
- *TVA Transmission Construction Guidelines Near Streams,*
- *TVA Environmental Quality Protection Specifications for Transmission Substation or Communications Construction, and*
- *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities – Revision 3* (TVA's BMP manual; TVA 2017a).

These documents are available on TVA's electrical transmission network projects web page (TVA 2020b), and all but TVA's BMP manual are provided in Appendix C. TVA transmission projects also utilize BMPs for clearing and construction activities and for lighting for substations and similar facilities, such as the BESS (TVA 2017b and 2020b). These BMPs are also provided in Appendix C.

### **2.2.3.2 Substation Construction**

TVA proposes to construct the Project substation, encompassing 5.7 acres near the southern boundary of the Project Site, to connect the solar PV facility to TVA's existing L5148. Three 161-kV breakers would be installed in a ring bus configuration along with associated metering, communication, and protective equipment. TVA would also install a switch house. The substation location would be fenced and graveled and would have lighting to facilitate night access. As described in TVA's *Substation Lighting Guidelines* (TVA 2020c; Appendix C), lights at the proposed substation would be fully shielded or would have internal low-glare optics, such that no light is emitted from the fixtures at angles above the horizontal plane.

TVA would clear vegetation on the substation site, remove the topsoil, and grade the property in accordance with TVA's *Site Clearing and Grading Specifications* (TVA 2017b; Appendix C). To clear trees and other tall vegetation, equipment used could include chain saws, skidders, bulldozers, tractors, and/or low ground-pressure feller-bunchers. As necessary, any woody debris and other vegetation would likely be piled and burned, chipped, or taken offsite. Prior to burning, TVA would obtain any necessary permits. In some instances, vegetation may be windrowed along the edge of the construction site to serve as sediment barriers. Further guidance for clearing and construction activities can be found in Appendix C and TVA's BMP manual.

The proposed substation location would be leveled through a cut-and-fill process to achieve final design grade. The areas of the site that are too high (sloped) would be "cut" down to a level elevation, and other areas that are too low require "fill" to raise the elevation. Any additional fill required would be obtained from an approved/permitted borrow area. Once the substation site has been graded, excess soil (i.e., "spoil") would be removed in preparation for construction of concrete foundations for substation components. Temporary spoil storage is proposed to be located on site. Silt fences and site drainage structures would be installed during construction in accordance with the Project-specific CBMPP.

Following clearing, grading, and construction, disturbed areas on the properties (excluding the area within the fencing) would be restored to approximate pre-construction conditions, to the extent practicable, utilizing appropriate seed mixtures as described in TVA's BMP manual. Erosion controls would remain in place for each phase until that portion of the project is stabilized in accordance with the Project-specific CBMPP.

### **2.2.3.3 Transmission Line Upgrades**

TVA has determined that modifications to the existing TVA Reservation–Mountain Home 161-kV TL are necessary to support communication needs related to the proposed solar PV facility. Overhead fiber optic ground wire (OPGW) would be installed on 7.9 miles of the line from existing Structure 247 to the Mountain Home 161-kV Substation, located in Lawrence and Morgan counties, Alabama. Splice cases would be installed on existing Structures 247, 272, 291, and 308. Structure modifications would also be required to support the new OPGW. These modifications would include adding cross bracing and cross arms to existing structures along the TL and replacing Structures 249, 251, 283, and 302 with new structures in the same locations to support the new fiber. Existing access roads would be utilized to access the structures. As part of the effort, TVA would improve these, if needed, such as by adding gravel or doing minor grading. Light tree trimming or removal of small trees in the roads may also be necessary.

More details on these actions are provided in the following subsections.

#### **2.2.3.3.1 Fiber Installation**

Installation of OPGW would be performed either using ground equipment or by helicopter. A lineman would work from structure to structure unclipping the existing overhead ground wire (OHGW) and installing a pulley. Equipment would be placed at predetermined points along the existing TL, based on the length of the OPGW to be newly installed, ranging from 10,000 to 15,000 feet of fiber per reel. The OHGW would be removed while a rope is pulled through the newly installed pulleys. The rope would then be used to pull the OPGW through the pulleys. Afterward, the lineman would revisit each structure to clip the OPGW to the structure and remove the pulley. Using this method, one reel of OPGW would be installed approximately every two working days, weather permitting.

#### **2.2.3.3.2 Reconductoring**

Reconductoring involves replacing the existing conductors with those compatible with OPGW. Three conductors (the cables that carry the electrical current) are required to make up a single circuit in AC TLs. For a 161-kV TL, each single-cable conductor is attached to porcelain insulators that are either suspended from the structure cross arms or attached directly to the structure.

Reels of conductor and ground wire would be delivered to the construction assembly area, and temporary clearance poles would be installed at road crossings to reduce interference with traffic. A small rope would be pulled from structure to structure. The rope would be connected to the conductor and ground wire and used to pull these 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.

#### **2.2.3.3.3 Rebuilding**

Rebuilding portions of the TLs would require installing new conductors and would require replacing four structures, as described above. The structures would normally be lifted out of



the ground by crane-like equipment. Access to the structures would be via existing roads. Replacement of structures may require leveling the area surrounding the replaced structures, but additional area disturbance would be minor compared to the initial installation of the structure. Poles at angles (angle points) in the TL may require supporting screw-, rock-, or log-anchored guys. Replacement poles would be directly imbedded in holes where prior structures were removed or newly augured into the ground to a depth equal to 10 percent of the pole's length plus an additional two feet, typically about 10 to 12 feet deep. Installation of replacement poles would require blasting where bedrock is within the depth necessary to imbed the poles. Normally, the holes would be backfilled with the excavated material, but in some cases, gravel or a concrete-and-gravel mixture would be used, depending on local soil conditions. Equipment used during the construction phase would include trucks, truck-mounted augers, drills, and excavators, as well as tracked cranes and bulldozers. Low ground-pressure-type equipment would be used in specified locations, such as areas with soft ground, to reduce the potential for environmental impacts per TVA BMPs.

If retired, any steel structures would be evaluated for recycling. Any retired wooden poles would be offered to the local power company or property owners. If any wooden poles remain and require disposal, a special permit would be obtained, and TVA would follow its transmission environmental protection procedures for reuse and/or disposal (TVA 2020b). Likewise, any lead pins removed from the retired insulators would be handled according to TVA's transmission environmental protection procedures and guidelines (TVA 2020b).

#### **2.2.3.3.4 Access Road Improvements**

Network upgrades may require improvements to existing access roads. Access roads would be needed to allow vehicular access to each structure and other points along the existing TLs. Typically, new permanent or temporary access roads used for TLs are located on the TL ROW wherever possible and are designed and located to avoid severe slope conditions and to minimize impacts to environmental resources such as streams. TL access roads are typically about 12- to 16-foot wide and are surfaced with dirt, mulch, or gravel. Permanent access to the Project substation would be within the Project Site, via a 30-foot-wide road off of CR 377.

With the appropriate permits as described in Section 1.4.2, culverts and other drainage devices, fences, and gates would be installed as necessary. Culverts installed in any perennial or intermittent streams would be removed following construction. However, in ephemeral streams, the culverts would be either left or removed, depending on the wishes of the landowner or any permit conditions that might apply. If desired by the property owner, TVA would restore new temporary access roads to previous conditions. Additional applicable environmental quality protection specifications are provided in Appendix C.

#### **2.2.3.4 Other Transmission System Modifications**

In addition to the activities described above, TVA would make the following modifications to other components of the transmission system.

- Upgrade system protections for required transfer trip and pilot protection,
- Provide communication equipment for transfer trip and supervisory control and data acquisition,
- Conduct system protections and communications work at remote sites for pilot protection and communications path,
- Install pre-insertion resistance enhancement on the existing 161-kV capacitor bank circuit switcher at the Trinity 161-kV Substation, and

- Modify TVA map boards to include the new Project substation.

#### **2.2.4 Solar Facility Operations**

During operation of the solar facility, no major physical disturbance would occur. Moving parts of the solar facility would be restricted to the east-to-west facing tracking motion of the solar modules, which amounts to a movement of less than a one degree angle every few minutes. This movement maximizes the collection of solar energy by rotating with the sun and is barely perceptible. In the late afternoon, module rotation would start to move from west-to-east in a similar slow motion to minimize row-to-row shading. At sunset, the modules would track to a flat or angled stow position. With the exception of fence repair, vegetation control, and periodic array inspection, repairs, and maintenance, the North Alabama Utility-Scale Solar Facility would have relatively little human activity during operation. The substation and the BESS would have water and sewer service and permanent lighting. The lighting would be fully shielded or would have internal low-glare optics, such that no light is emitted from the fixtures at angles above the horizontal plane to minimize impacts to surrounding areas, as described in TVA's *Substation Lighting Guidelines* (TVA 2020c; Appendix C).

During operations, the North Alabama Utility-Scale Solar Facility may require small groups of workers to be on site occasionally to manage the facility and conduct regular inspections. Inspections would include identifying any physical damage to panels, wiring, central inverters, transformers, and interconnection equipment, and drawing transformer oil samples. Vegetation on developed portions of the Project Site would be maintained to control growth. Near the solar facility infrastructure, vegetation would be managed to prevent shading of the PV panels. Trimming and mowing in these areas would likely be performed several times per year, depending on growth rate, to maintain an appropriate groundcover height of approximately 12 to 18 inches. USEPA-registered and TVA-approved herbicides and pesticides, in accordance with TVA BMPs, may be selectively used alongside trimming and mowing to maintain vegetation and limit invasive species. Grazing sheep may also be used to manage vegetation within portions of the fenced-in, developed solar facility area not limited by other constraints. Additional fencing for the sheep would be used to limit their movement and manage vegetation growth.

Precipitation in the region is typically adequate to remove dust and other debris from the PV panels while maintaining energy production; therefore, manual panel washing is not anticipated unless a site-specific issue is identified. If identified as a need, module washing would occur no more than twice a year and would comply with proper BMPs to prevent any soil erosion and/or stream and wetland sedimentation. The washing would not be expected to produce a discharge waste stream.

The proposed project facility would be monitored remotely. Monitoring would occur 24 hours a day, seven days a week to identify any security or operational issues. In the event an immediate response is warranted, a local repair crew would be deployed or law enforcement personnel would be requested to respond.

#### **2.2.5 Decommissioning and Reclamation**

The Project would operate and transmit power to the TVA electrical network for up to 20 years and potentially longer. When operations eventually cease, the facility would be decommissioned and dismantled, and the Project Site would be restored per Project decommissioning requirements. The decommissioning process would be coordinated with Lawrence County. In general, the majority of decommissioned equipment and materials

would be removed and recycled. Materials that cannot be recycled would be disposed of at an approved facility in accordance with federal, state, and local laws and regulations. Other wastes, including batteries that are removed when the system is decommissioned, would be disposed of offsite and/or recycled in accordance with manufacturer recommendations and appropriate regulations and industry BMPs.

### **2.3 Alternatives Considered but Eliminated from Further Consideration**

In 2018, TVA initiated a study to evaluate suitable locations to construct utility-scale solar PV facilities. In the study, TVA employed a ranking system to determine the most suitable locations that would have the least effects to the natural and human environment at a feasible cost, as described in more detail below.

TVA-owned brownfield, landfill, and greenfield sites within the TVA service area were initially considered in the study. These included the Widows Creek, Johnsonville, Colbert, and John Sevier fossil plants landfill sites and the Saltillo, Hartsville, Clinch River, and Murphy Hill former potential nuclear sites. Each of these TVA-owned sites was determined not to be viable for solar facility development due to substantial electrical interconnection- or construction-related costs. Properties offered for sale on the real estate market were evaluated next in the study. These private properties were either deemed of insufficient size to accommodate utility-scale solar development or too distant from the existing electrical transmission network to make interconnection affordable.

Finally, the property search was extended to private properties not being offered for sale that demonstrated the following characteristics:

- Proximal to existing 161-kV transmission network;
- Located outside of Federal Emergency Management Agency (FEMA)-identified floodplains;
- Primarily composed of open, relatively level agricultural areas and, thus, lacking large forested areas;
- Constituting 1,000 acres or more<sup>1</sup> with few individual landowners;
- Easily accessible for construction and operations purposes; and
- Located in a rural area.

Private properties with these characteristics were sought in northern Alabama, western Tennessee, and northern Mississippi, due to the favorable topography in these areas. Properties that satisfied the initial screening process were then evaluated for transmission upgrade needs and overall cost feasibility. Properties with minimal upgrade needs were deemed viable.

The properties that remained viable, a total of 24 sites, were then subjected to formal desktop analyses. Data from the National Wetland Inventory (NWI), National Hydrography Dataset, National Land Cover Database (NLCD), USGS topographic quadrangles, U.S. Department of Agriculture (USDA) Digital Elevation Models, USDA-Natural Resources Conservation Service, FEMA, and aerial photography were used to determine general site characteristics and evaluate topography, land cover, soils, water resources, threatened and

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<sup>1</sup> This requirement could also be met by a combination of smaller, nearby tracts under the control of the same landowners.



endangered species, and cultural resources on each site and in the vicinity, as relevant to the resource area. Federal, state, and local permitting needs for each site were considered in the analyses.

The environmental findings, along with factors such as estimated solar facility output and proximity to transportation resources, were evaluated as part of seven ranking criteria and input into a matrix to assign each considered property an overall rank. While all of the 24 sites were deemed viable for solar facility development, properties with known prior economic interests were eliminated from the list. TVA then contacted the landowners of the 13 remaining sites to inquire whether a Purchase Option Agreement could be arranged. Some of the sites were active farms or had other conditions, such as mineral rights being leased, that limited the use of the site as a solar facility. Based on additional desktop and field reviews, all of the potential alternative sites other than the Wheeler Alabama Site 5 North and Site 5 South, which together constitute the proposed Project Site, were eliminated from further consideration. The development of the majority of the 11 eliminated alternative sites may have resulted in less impacts on prime farmland than the Project Site (Table 2-1). However, their development would have resulted in greater potential for adverse impacts to wetlands and streams and/or was constrained by the presence of floodplains and adverse slope conditions.

A Purchase Option Agreement was established with the Lawrence County Project Site (the Wheeler AL Site 5 North and Site 5 South) landowner, who had already been considering a solar facility lease on the property, and a two-year evaluation process was arranged to allow TVA to further assess the economic feasibility and environmental impacts of utilizing the site. TVA purchased the Project Site prior to expiration of the Agreement in October 2021 to preserve the option of the Proposed Action Alternative in the ongoing environmental review.

**Table 2-1. Comparison of Prime Farmland by Alternative Site**

<b>Alternative Site Name</b>	<b>Total acreage</b>	<b>Prime farmland acreage</b>	<b>Prime farmland %</b>	<b>Developable acreage</b>
Holly Springs MS Site 1	2,316	899	38.8	1,562
Holly Springs MS Site 2	1,502	726	48.3	643
Holly Springs MS Site 3	824	403	48.9	548
North Courtland AL Site 4	1,056	720	68.2	994
Shelby TN Site 1	1,096	669	61.0	666
Shelby TN Site 2	1,014	781	77.0	758
Shelby TN Site 3	1,226	793	64.7	795
South Courtland AL Site 6	1,241	840	67.7	1,000
Trinity AL Site 1	1,025	496	48.4	484

<b>Alternative Site Name</b>	<b>Total acreage</b>	<b>Prime farmland acreage</b>	<b>Prime farmland %</b>	<b>Developable acreage</b>
Trinity AL Site 2	1,361	834	61.3	872
Wheeler AL Site 3	1,396	888	63.6	1,016
Wheeler AL Site 5 North	635	524	82.5	549
Wheeler AL Site 5 South	2,229	1,259	56.5	1,647

Source: USDA 2019a

AL = Alabama; MS = Mississippi; TN = Tennessee

## 2.4 Comparison of Alternatives

This EIS evaluates the potential environmental effects that could result from implementing the No Action Alternative and the Proposed Action Alternative on the Project Site in Lawrence County, Alabama. The analysis of impacts in this EIS is based on the current and potential future conditions on the properties and the surrounding project area.

In the case of the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts would occur. TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations and/or implement environmental enhancement measures for the state-listed Tuscumbia darter and the globally rare round-rib elimia, as described in Section 2.2 and 2.5. TVA would continue to maintain its TL ROWs in the project area as described in Section 2.2.3.1. Impacts to the various environmental resources would thus be avoided, mitigated, or minimized per standard practices and BMPs, in consultation with state and other federal agencies, as required.

A comparison of the impacts of the alternatives is provided in Table 2-2.

**Table 2-2. Comparison of impacts by alternative**

<b>Resource Area</b>	<b>No Action Alternative</b>	<b>Proposed Action Alternative</b>
Land Use	<p>No direct or indirect Project-related impacts on land use.</p> <p>No adverse impacts to land use are anticipated during TVA's interim activities on the site. Potential future impacts depending on future development or disposal of the site.</p>	<p>Minor direct impacts on land use due to change from agricultural to industrial; however, Lawrence County does not have a land use plan for the unincorporated portions of the county, nor are lands subject to zoning restrictions.</p>
Geology, Soils, and Prime Farmland	<p>No direct or indirect Project-related impacts on geology, soils, and prime farmland.</p> <p>No adverse impacts to geology, soils, and prime farmland are anticipated</p>	<p><i>Geology:</i> Minor direct impacts to potential subsurface geological resources.</p> <p><i>Soils:</i> Minor direct impacts resulting from minor to minimal increases in</p>

Resource Area	No Action Alternative	Proposed Action Alternative
	<p>during TVA's interim activities on the site.</p> <p>Potential future impacts on geology, soils, and prime farmland depending on future development or disposal of the site.</p>	<p>erosion and sedimentation during construction and operation of the solar facility and improvements to existing access roads and replacement of TL structures. While in operation, adverse impacts to soils would be partially offset by beneficial effects to soil health with the use of native and/or non-invasive vegetation.</p> <p><i>Prime Farmland:</i> Moderate direct impacts from removal of 1,074 acres of prime farmland from most potential agricultural use for the duration of the Project. This represents approximately 1.1 percent of farmland in the county.</p>
Water Resources	<p>No direct Project-related impacts on water resources.</p> <p>No adverse impacts to water resources during TVA's interim activities on the site.</p> <p>Potential future impacts on water resources depending on future development or disposal of the site.</p>	<p><i>Groundwater:</i> No direct adverse impacts anticipated; minor beneficial indirect impacts to groundwater due to reduction in fertilizer and pesticide use and planting of native vegetation.</p> <p><i>Surface Water and Wetlands:</i> Minor beneficial indirect impacts to surface water due to reduction in fertilizer and pesticide use compared with current agricultural use. Minor direct and indirect impacts due to construction effects to approximately 20 ephemeral streams (14,891 LF) for driving of pilings to support the solar PV arrays and road crossings, two perennial or intermittent streams (96 LF) for road crossings,<sup>2</sup> and one linear wetland (0.07 acre) for a road crossing. Impacts to wetlands would occur with the replacement of pole structures on existing TLs, which would affect about 0.0005 acre per structure to be replaced.</p> <p><i>Floodplains:</i> Minor direct and indirect impacts due to construction activities and installation of Project fences and access roads or access road improvements in the TL upgrade locations.</p>

<sup>2</sup> The impacts to perennial or intermittent streams were newly identified with design changes after release of the Draft EIS. The permitting measures for these impacts remain as stated in Section 1.4.2 of the Draft EIS.

Resource Area	No Action Alternative	Proposed Action Alternative
Biological Resources	<p>No direct or indirect Project-related impacts on biological resources.</p> <p>No adverse impacts to biological resources are anticipated during TVA's interim activities on the site.</p> <p>Potential future adverse impacts on biological depending on future development or disposal of the site.</p>	<p><i>Vegetation:</i> Minor adverse impacts to vegetation by clearing up to approximately 320 acres of trees and other tall vegetation within the 1,459-acre portion of the Project Site proposed for development and revegetating this portion of the Project Site with native and/or non-invasive plants. Vegetation impacts would be reduced by beneficial effects from establishment of a species-rich native plant meadow.</p> <p><i>Wildlife:</i> Minor direct and indirect adverse impacts to migratory birds and other wildlife due to habitat removal, particularly forest clearing, and revegetation. Beneficial effects to early successional wildlife by establishment of a species-rich native plant meadow.</p> <p><i>Aquatic Life:</i> Minor impacts due to potential herbicide runoff and increases in erosion and siltation.</p> <p><i>Threatened and Endangered Species:</i> No direct adverse impacts anticipated to the state-listed Tuscumbia darter and the globally rare round-rib elimia; minor beneficial impacts to these two species from habitat enhancement actions along Wheeler Branch. With implementation of avoidance measures and use of BMPs, the Project is not likely to significantly affect a population of the federally endangered plant fleshy-fruit gladeceess, located along one span of the Reservation–Mountain Home 161-kV TL ROW, and associated designated critical habitat located near the TL upgrade locations. With seasonal restrictions on suitable bat habitat removal and use of BMPs near caves, the Project is not likely to significantly affect federally or state-listed species.</p>
Natural Areas, Parks, and Recreation	<p>No direct or indirect Project-related impacts on recreation.</p> <p>Minor impacts to recreation are anticipated during TVA's interim activities on the site, as TVA would</p>	<p>Minor impacts from elimination of dispersed outdoor recreational activities, including hunting.</p>

Resource Area	No Action Alternative	Proposed Action Alternative
	not allow hunting on site. These activities could occur in nearby recreational areas.	
	Potential future impacts depending on future development or disposal of the site.	
Visual Resources	<p>No direct or indirect Project-related impacts on visual resources.</p> <p>Negligible change in the appearance of the site during TVA's interim activities on the site.</p> <p>Potential future adverse impacts to visual resources depending on future development or disposal of the site.</p>	<p>Temporary, minor impacts on visual resources during the construction phase due to altering the visual character and increased activity.</p> <p>Temporary, minor impacts on visual resources in the vicinity of the TL upgrade locations during installation of OPGW, modifications to the existing TL, and other equipment associated with the TL upgrades. Long-term, minor impacts due to the replacement of existing structures with taller metal structures that would increase their visibility.</p> <p>During operations, minor to moderate adverse impacts in the immediate vicinity due to presence of PV panels and other Project components; however, the visual impacts would be partially offset by maintenance of existing tree buffers in some areas surrounding the Project Site.</p>
Noise	<p>No direct or indirect Project-related impacts on noise.</p> <p>No adverse impacts on the ambient sound environment are anticipated during TVA's interim activities on the site.</p> <p>Potential future adverse impacts depending on future development or disposal of the site.</p>	<p>Minor, temporary adverse impacts would occur during construction. Minimal to negligible impacts during operations and maintenance.</p>
Air Quality and GHGs	<p>No direct or indirect Project-related impacts on air quality and GHGs.</p> <p>No adverse impacts on air quality and GHGs are anticipated during TVA's interim activities on the site.</p> <p>Potential future increase in emissions from the site depending on future development or disposal of the site.</p>	<p><i>Air Quality:</i> Minor direct impacts during construction and operation of the Project. Long-term, minor beneficial impacts due to increasing the capacity of non-emitting generating facilities providing power to the TVA system and offsetting the need for power that would otherwise</p>

Resource Area	No Action Alternative	Proposed Action Alternative
		be generated by the combustion of fossil fuels.  <i>GHGs:</i> Temporary, negligible increase in GHG emissions during construction, resulting in temporary negligible effects. Offsetting beneficial effects would also occur, due to the nearly emissions-free power generated by the solar facility, offsetting the need for power that would otherwise be generated by the combustion of fossil fuels.
Cultural Resources	<p>No direct or indirect Project-related impacts on cultural resources.</p> <p>No impacts to cultural resources are anticipated during TVA's interim activities on the site.</p> <p>Potential future adverse impacts on cultural resources depending on future development or disposal of the site.</p>	<p>With avoidance and implementation of 100- to 600-foot buffers around historic and other sensitive cultural resources, the Project would not adversely affect archaeological sites and individually eligible architectural resources. The Project would adversely affect the newly recorded WSRHD, which TVA would address by implementing mitigation measures.</p>
Utilities	<p>No direct or indirect Project-related impacts on utilities.</p> <p>No impacts to utilities are anticipated during TVA's interim activities on the site.</p> <p>Potential future impacts on utilities depending on future development or disposal of the site.</p>	<p>Potential short-term, minor impacts to local utilities (electricity and telecommunication connections) when bringing the solar facility on-line or during routine maintenance of the facility. Long-term, minor beneficial impacts to electrical services across the region.</p>
Waste Management	<p>No direct or indirect Project-related impacts on waste management.</p> <p>No impacts on waste management are anticipated during TVA's interim activities on the site.</p> <p>Potential future impacts on waste generation and management depending on future development or disposal of the site.</p>	<p>No adverse impacts to waste management are anticipated with the use of BMPs.</p>
Public Health and Safety	<p>No direct or indirect Project-related impacts on public health and safety.</p> <p>No impacts to public health and safety are anticipated during TVA's interim activities on the site.</p> <p>Potential minor future impacts on public health and safety depending on</p>	<p>Minor, temporary impacts during construction that would be minimized with adherence to OSHA regulations and health and safety plans.</p>

Resource Area	No Action Alternative	Proposed Action Alternative
	future development or disposal of the site.	
Transportation	<p>No direct or indirect Project-related impacts on transportation.</p> <p>No impacts to transportation are anticipated during TVA's interim activities on the site. However,</p> <p>Potential future impacts on transportation depending on future development or disposal of the site.</p>	<p>Minor direct impacts to transportation during construction. Project effects to normal traffic patterns, if they occur, would be minimized by implementation of specific measures designed to address the effects, in coordination with ALDOT.</p>
Socioeconomics	<p>No direct or indirect Project-related impacts on socioeconomics.</p> <p>Negligible change in area socioeconomic conditions during TVA's interim activities on the site.</p> <p>Potential future impacts on socioeconomics depending on future development or disposal of the site.</p>	<p>Short-term, minor beneficial economic impacts would result from construction, including the purchase of materials, equipment, and services and a temporary increase in employment, income, and population.</p> <p>Long-term, minor beneficial impacts to economics and population from Project operation. The local tax base may increase with operation of the solar facility and would be most beneficial to Lawrence County and the vicinity.</p>
Environmental Justice	<p>No direct or indirect Project-related impacts on environmental justice.</p> <p>No impacts on minority or low-income populations during TVA's interim activities on the site.</p> <p>Potential minor future impacts on minority or low-income populations depending on future development or disposal of the site.</p>	<p>No disproportionately high or adverse direct or indirect impacts on minority or low-income populations.</p>

## 2.5 Identification of Mitigation Measures

TVA would implement minimization and mitigation measures for resources potentially affected by the Project. These would be developed with consideration to BMPs, permit requirements, and adherence to the CBMPP.

TVA would employ specific routine measures and other Project-specific measures to avoid and minimize impacts to resources from implementation of the Proposed Action. Comments received during the scoping period did not identify specific mitigation measures for the Proposed Action. TVA would implement the following minimization and mitigation measures in relation to potentially affected resources and would include any of these measures that would need to be employed during operations in the terms of the PPA:

- Land Use and Visual Resources

- Install anti-reflective PV panels to minimize or eliminate negative visual impacts from glare and reflection, and
  - Maintain existing vegetative buffer outside developed portions of the Project Site;
- Geology and Soils
  - Comply with the terms of the CBMPP prepared as part of the NPDES permitting process to control soil erosion and runoff, such as the installation of erosion control silt fences and sediment traps,
  - Implement other soil stabilization and vegetation management measures to reduce the potential for soil erosion during site operations, and
  - Avoid compromising the structure integrity or altering the karst hydrology by controlled TL upgrade-related drilling and blasting within a 0.5-mile radius of documented caves;
- Water Resources
  - Comply with the terms of the CBMPP prepared as part of the General Construction Stormwater NPDES permitting process to control soil erosion and runoff, such as the installation of erosion control silt fences and sediment traps,
  - Establish 50-foot avoidance buffers surrounding perennial and intermittent streams and wetlands, where only non-mechanical tree and other woody vegetation removal would occur (except in limited areas for Tuscumbia darter and round-rib elimia conservation efforts),
  - Implement other routine BMPs as necessary, such as restricted herbicide application near streams, wetlands, caves and sinkholes, and proper vehicle maintenance to reduce the potential for adverse impacts to surface and groundwater resources,
  - To minimize adverse impacts to floodplains and their natural and beneficial values, any fence constructed within 100-year floodplain would be designed and constructed to withstand flooding with minimal damage,
  - When the facility is decommissioned and dismantled, deconstruction and demolition debris would be deposited outside the 100-year floodway,
  - Road improvements crossing floodplains would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot, and
  - Avoid impacts to groundwater by controlled TL upgrade-related drilling and blasting within a 0.5-mile radius of documented caves;
- Biological Resources
  - Revegetate with native and/or non-invasive vegetation to restore habitat, including a 150-acre native plant meadow that would promote pollinators in the project area; reduce erosion; limit the spread of invasive species, and follow USFWS recommendations regarding biological resources and pollinator species,
  - Ensure that any soil, baled hay or straw, plants and sod with roots and soil attached, soil-moving equipment, or other “Regulated Articles,” as defined by



USDA, are in compliance with Animal and Plant Health Inspection Service (APHIS) Quarantine Regulations,

- To minimize Project effects to the state-listed Tuscumbia darter and the globally rare round-rib elimia, thin the dense vegetative buffer along Wheeler Branch to expand suitable habitat for the two species and maintain the thinned buffer during Project operation,
- Use of downward facing and/or low-glare lighting to limit attracting wildlife, particularly migratory birds,
- Minimize direct impacts to some migratory birds and federally listed tree roosting bats by clearing trees and shrubs in winter months (November 15 to March 15) outside of nesting season and roosting season, respectively, and
- To avoid and minimize effects to federally listed bats during TL upgrades, avoid compromising the structure integrity or altering the karst hydrology of the cave by controlled TL upgrade-related drilling and blasting within a 0.5-mile radius of documented caves, to include:
  - Restricting these and other TL upgrade activities involving continuous noise to warmer months, between March 16 and October 14, when bats are not present in caves, and
  - Employing appropriate BMPs during TL upgrade-related vegetation clearing or herbicide use within a 200-foot radius of caves or the portals of caves that could support federally listed bats;
- Noise
  - Limit construction activities primarily to daytime hours and ensure that heavy equipment, machinery, and vehicles utilized at the Project Site meet all federal, state, and local noise requirements;
- Air Quality
  - Comply with local ordinances or burn permits if burning of vegetative debris is required and use BMPs such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust;
- Cultural Resources
  - Adhere to setbacks from certain NRHP-eligible and listed cultural resources, as discussed in Section 3.10, and other avoidance, minimization, and mitigation measures in consultation with AHC and federally recognized tribes;
  - Adhere to the following NHPA Section 106 MOA stipulations:
    - TVA would produce two copies of a traveling exhibit consisting of three to five retractable displays on African American life in late nineteenth to mid-twentieth century Lawrence County and WSRHD. One copy would be delivered to AHC, while the other copy would be used for future TVA public events within the region,
    - TVA would construct a wooden fence along the eastern boundary of NRHP-listed Pond Spring to match the existing fencing along the north edge of the property and in keeping with the historical documented fencing, and

- TVA would prepare updated NRHP nomination forms for Pond Spring and Bride's Hill and submit to AHC within one year of the signature of the MOA;
- Waste Management
  - Dispose of wastes in approved, offsite facilities, and no new on-site waste management facilities would be developed;
  - Develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials; and
- Public and Occupational Health and Safety
  - Emphasize BMPs in health and safety plans for site safety management to minimize potential risks; and
- Transportation
  - While not anticipated based results of a traffic study, implement mitigation measures in coordination with ALDOT if traffic from the Project activities substantially disrupt normal traffic patterns in the area.

TVA employs standard practices when constructing, operating, and maintaining TLs, structures, and the associated ROW and access roads. Routine measures that would be taken to reduce the potential for adverse environmental effects during the construction, operation, and maintenance of the proposed transmission line and access roads are as follows:

- TVA would utilize standard BMPs to minimize erosion during construction, operation, and maintenance activities associated with the transmission modifications. These BMPs are described in *A Guide for Environmental Protection and BMPs for TVA Construction and Maintenance Activities – Revision 3* (TVA's BMP Manual) and the *Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management on Construction Sites and Urban Areas*.
- To minimize the introduction and spread of invasive species in the ROW, access roads, and adjacent areas, TVA would follow standard operating procedures consistent with EO 13112 (Invasive Species) for revegetating the areas with non-invasive plant species as defined by TVA.
- Stream reaches that could be affected by the proposed construction would be protected by implementing standard BMPs as identified in TVA's BMP manual and the *Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management on Construction Sites and Urban Areas*.
- In areas requiring chemical treatment, only USEPA-registered and TVA-approved herbicides and other pesticides would be used in accordance with label directions designed, in part, to restrict applications near receiving waters and to prevent unacceptable aquatic impacts.
- To minimize adverse impacts on natural and beneficial floodplain values, the following mitigation measures would be implemented:
  - Construction in the floodplain would adhere to the TVA subclass review criteria for TL location in floodplains,
  - BMPs would be used during construction activities,

- To the extent practicable, TL construction and maintenance activities would be scheduled during dry periods,
- Road improvements crossing floodplains would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot, and
- The TL ROW would be revegetated where vegetation is removed.

## **2.6 The Preferred Alternative**

TVA's preferred alternative for fulfilling its purpose and need is the Proposed Action Alternative. This alternative would generate renewable energy for TVA and its customers with only minor environmental impacts due to the implementation of BMPs and minimization and mitigation efforts, as described in Section 2.5. Implementation of the Project would help meet TVA's renewable energy goals and would help TVA meet customer-driven energy demands on the TVA system.



## CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

### 3.1 Introduction

This chapter describes the existing environmental, social, and economic conditions of the project area, as defined for each resource area, and the potential effects on those resource areas that would result from implementing the No Action Alternative or the Proposed Action Alternative. TVA determined that the potentially affected resources are land use; geology, soils, and prime farmland; groundwater/water supply; surface water; floodplains; vegetation; wildlife; threatened and endangered species; natural areas, parks, and recreation; visual resources; noise; air quality and greenhouse gas emissions; cultural resources; utilities; waste management; public and occupational health and safety; transportation; socioeconomics; and environmental justice.

### 3.2 Land Use

This section describes existing land use in the project area and potential impacts to land use associated with the No Action and Proposed Action alternatives.

#### 3.2.1 Affected Environment

Land use is defined as the way people use and develop land, including leaving land undeveloped or using land for agricultural, residential, commercial, and industrial purposes. The Project Site is located entirely in an unincorporated portion of northern Lawrence County, Alabama. Lawrence County's Revenue Department classifies the project area, including the Project Site, as agricultural and forested land (Lawrence County 2019). Lawrence County does not have a land use plan for the unincorporated portions of the county nor are lands subject to zoning restrictions outside the incorporated city of Moulton.

Images generated with the NLCD evaluation, visualization, and analysis tool show the Project Site as primarily cultivated crops, hay/pasture, woody wetlands, and forest (Figure 3-1). The 2,896-acre Project Site consists of flat to gently rolling terrain that ranges in elevation from approximately 570 to 840 feet above mean sea level. Topography is highest on the southeastern portion of the Project Site, decreasing toward the north. Approximately four percent (124 acres) of the Project Site contains pervious and impervious roads. Approximately 31 percent (890 acres) of the Project Site's total area is cultivated crops and hay/pasture and approximately 50 percent (1,462 acres) consists of forested areas and woody wetlands. The remaining 15 percent (420 acres) of the Project Site consists of herbaceous land.

US 72A extends east-west, bisecting the northern and southern portions of the Project Site. SR 33 extends north-south in the western portion of the Project Site and CR 377 extends north-south in the eastern portion of the Project Site. Agricultural and rural-residential land uses dominate the landscape north, west, and east of the Project Site while forested land uses dominate the landscape south of the Project Site. Several businesses are present alongside US 72A west and east of the Project Site. West of SR 33, along CR 285, a small residential concentration is adjacent to the southwestern portion of the Project Site. East of SR 33, along CR 286, another small residential concentration is adjacent to the southwestern portion of the Project Site. A third small residential concentration exists east of CR 377, along Browns Ferry Road, adjacent to the northern portion of the Project Site. The closest municipalities are the unincorporated community of Wheeler and the town of Courtland. Approximately 609 people reside in Courtland (USCB 2022a).

Available historical aerial photographs and topographic quadrangles document that land use in the project area has remained relatively unchanged, at least since the early 1950s but likely earlier, based on historical trends (USGS 2019). Throughout this time, land uses in the project area have been primarily agricultural and rural-residential, and major elements, such as US 72A, SR 33, CR 377, and some TLs have been present for some time.

### **3.2.2 Environmental Consequences**

This section describes the potential impacts to land use should the No Action or Proposed Action alternative be implemented.

#### **3.2.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to land use would result.

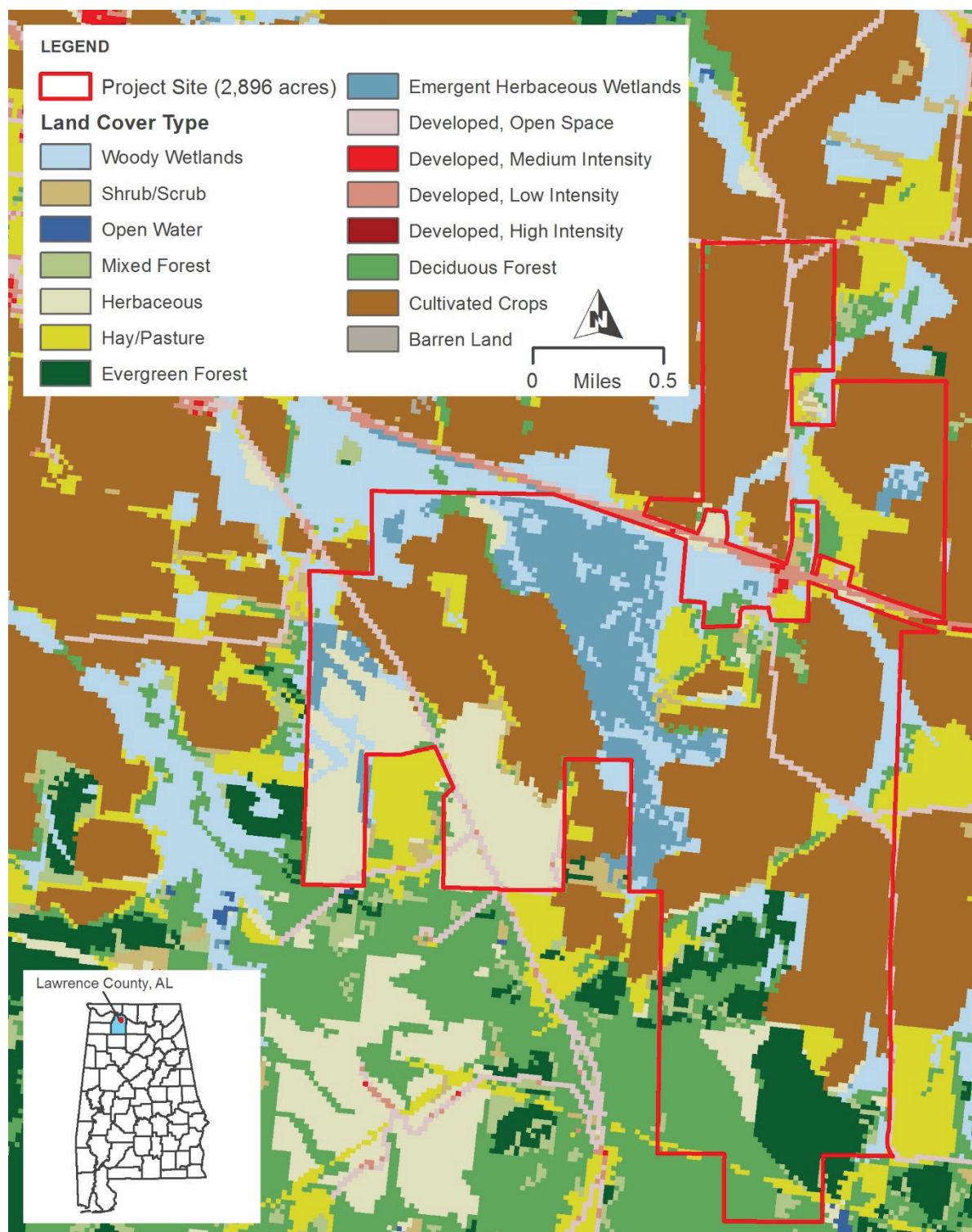
TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into leases(s) with local farmer(s) for continued agricultural operations and/or implement environmental enhancement measures for the state-listed Tusculumbia darter and the globally rare round-rib elimia. These actions would maintain the current land uses. Land uses of the Project Site would likely change in the future if TVA decides to develop and/or dispose of the site.

#### **3.2.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Land uses within the 1,459-acre area of the Project Site that would be converted to the solar PV facility and associated infrastructure would change from agricultural and forest to industrial (Developed, Medium Intensity, with High Intensity in the substation and BESS location) with construction and operation of the solar PV facility. An additional 150 acres of the Project Site outside of the 1,459-acre area would be modified by the Project for environmental mitigation as species-rich meadow. This would change additional acreage from agricultural use. Because the Project Site is considered agricultural and forested land with no zoning restrictions, the development of the Project Site as a solar facility and environmental enhancement area is compatible with current land use regulations. The Project-related TL upgrades along TVA's existing TLs would not change current land uses.

The activities associated with the Project would not have any indirect effects on land use, as further changes to the rural area would not be expected to be stimulated by the solar facility. The Project would convert agricultural land to non-agricultural uses for at least 20 years. Upon decommissioning of the solar farm, the land could return to agricultural and silvicultural uses.



**Figure 3-1. Land cover in the Project Site vicinity**

### **3.3 Geology, Soils, and Prime Farmland**

This section describes the existing geology, soils, and prime farmland in the project area and the potential impacts on these resources that would be associated with the No Action and Proposed Action alternatives. Existing conditions for these resource areas are presented for the Project Site vicinity, where concentrated Project effects to these resource areas could occur. Project effects are also assessed for the TL upgrade activities. Resources that are analyzed include geology, paleontology, geological hazards, soils, and prime farmland.

#### **3.3.1 Affected Environment**

The Project Site is located in the Interior Low Plateaus physiographic province of the Interior Plains division (Fenneman 1928). In the contiguous U.S., the Interior Low Plateaus extend from northern Alabama through central Tennessee and Kentucky into southern Illinois, Indiana, and Ohio, spanning approximately 74,000 square miles (LandScope America 2020). The Project Site is in the Eastern Highland Rim section of the Low Plateaus province and is underlain by carbonate bedrock of the Mississippian Period. The landscape of the Eastern Highland Rim is characterized by an undulating plateau surrounding the Nashville Basin (USEPA 2017).

##### **3.3.1.1 Geology and Paleontology**

Alabama was a shallow, tropical sea during the Paleozoic Era. Erosion and deposition of sediments into the sea created a broad, tropical coastal plain where primitive trees and fern-like plants thrived. These forests are the source of the coal deposits across much of northern Alabama. The Permian was mainly a time of erosion, and no deposits of this period are known in the state (Paleontology Portal 2020). Fossils in the area are typically located in the underlying limestones and consist mainly of Mississippian age oceanic fossils (e.g., corals, brachiopods, crinoids, etc.; Fossil Spot 2008). The project area is underlain by bedrock layers of limestone and chert. Well records from the Geological Survey of Alabama (GSA) show bedrock as shallow as 18 feet below ground surface. In this region, Mississippian-age, calcareous geologies predominate, which results in karst features including springs, sinks, and caves (Griffith et al. 2001). Two known caves occur less than 137 feet and approximately 0.2 mile from the TL upgrade locations.

##### **3.3.1.2 Geological Hazards**

Geological hazards can include landslides, volcanoes, earthquakes/seismic activity, and subsidence/sinkholes. Conditions do not exist on the Project Site for a majority of these types of hazards. The project area is located on relatively stable ground, with low rolling hills to the south, and GSA shows the project area as having no to very low risk of landslides (Ebersole et al. 2011). No volcanoes are present within several hundred miles of the Project Site.

The carbonate bedrock geology and karst landforms in the project area have a high risk for sinkholes. Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. Land over sinkholes may stay intact until there is not enough support for the land above the spaces. Then, a sudden collapse of the land surface can occur. These collapses can vary greatly in size and shape (USGS 2020a). GIS data generated by GSA depicts portions of three mapped sinkholes and/or topographic depressions on the Project Site (GSA 2020). These total approximately two acres and occur along the southern boundary at the southwestern corner of the Project Site and along the eastern and western boundaries in



the northern portion of the Project Site. However, in a Project geotechnical study, surface signs of sinkhole activity, voids, or other signs of incipient sinkhole conditions were not observed (S&ME, Inc. 2021).

Seismic activity at the Project Site could cause surface faulting, ground motion, ground deformation, and conditions including liquefaction and subsidence. The Modified Mercalli Scale is used within the U.S. to measure the intensity of an earthquake. The scale arbitrarily quantifies the effects of an earthquake based on the observed effects on people and the natural and built environment. Mercalli intensities are measured on a scale of I through XII, with I denoting the weakest intensity and XII denoting the strongest intensity. The lower degrees of the scale generally deal with the manner in which the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. This value is translated into a peak ground acceleration (PGA) value to measure the maximum force experienced. The PGA is the maximum acceleration experienced by a building or object at ground level during an earthquake on uniform, firm-rock site conditions. The PGA is measured in terms of percent of “g,” the acceleration due to gravity. The USGS Earthquake Hazards Program publishes seismic hazard map data layers that display the PGA with ten percent probability of exceedance in 50 years (i.e., a one in 475-year event). The PGA for the project area is 0.0582g, with a 10 percent probability of exceedance within 50 years (USGS 2020b). A 0.0582g earthquake will have a moderate perceived shaking with light potential for structural damage (USGS 2020c). The Project Site has low risk for earthquakes that will cause structural damage.

### **3.3.1.3 Soils**

The Project Site contains 44 soil types. The majority of the mapped soils on the Project Site are composed of Decatur silty clay loam (14.8 percent); Tyler and Monongahela fine sandy loams (12.2 percent); Ooltewah silt loam (6.8 percent); Abernathy-Emory silt loams, zero to two percent slopes (5.3 percent); and Abernathy-Emory silt loams, zero to six percent slopes (5.1 percent); with other types of soil consisting of less than five percent each (Figure 3-2 and Table 3-1). Five soils on the Project Site have hydric ratings of 66 to 99 percent (Dowellton silty clay loam, Ooltewah fine sandy loam, Ooltewah silt loam, Prader silt loam, and Robertsville silt loam) and 21 other soils have hydric ratings of one to 33 percent. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. One of the two Decatur silty clay loam types, all three of the Tyler and Monongahela fine sandy loam types, and all four of the Abernathy-Emory silt loam types are classified as prime farmland soils (USDA 2019a).

The Decatur series soils consist of very deep, well drained, moderately permeable soils that formed in residuum derived from limestone. These soils are on level to strongly sloping uplands in valleys. Slopes are dominantly one to 10 percent but range up to 25 percent. The Tyler series soils consist of very deep, somewhat poorly drained soils formed in silty alluvium and in a mantle of loess on high Illinoian age terraces and valley fills. Permeability is moderately slow above the fragipan, slow or very slow in the fragipan, and moderately slow in the substratum. Slope ranges from zero to eight percent. The Monongahela series soils consist of very deep, moderately well drained soils formed in alluvial stream terraces that are not flooded. The Ooltewah series soils consist of very deep, somewhat poorly drained soils formed in loamy alluvium. The Abernathy series soils consist of very deep, well drained, moderately permeable soils. These soils formed in weakly developed local alluvium over residuum weathered from limestone or old alluvium. They are in intermittent drainageways and slopes range from zero to six percent. The Emory series soils consist of

very deep, well drained, moderately permeable soils. These soils formed in local alluvium and the underlying buried soil. They are in narrow strips along intermittent drainage ways, on toe slopes, and in bottoms of upland depressions. Slopes range from zero to four percent.

### 3.3.1.4 Prime Farmland

Prime farmland is land that is the most suitable for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops. Prime farmlands have the best combination of soil type, growing season, and moisture supply and are available for agricultural use (i.e., not water or urban built-up land). The Farmland Protection Policy Act (FPPA; 7 U.S.C. § 4201 *et seq.*), requires federal agencies to take into account the adverse effects of their actions on prime or unique farmlands. The purpose of the FPPA is “to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.” Table 3-1 describes the soil types, including those classified as prime farmland, located on the Project Site. Hydric rating is an indicator of the percentage of a map unit that meets the criteria for hydric soils (USDA 2019b).

**Table 3-1. Soils on the Project Site**

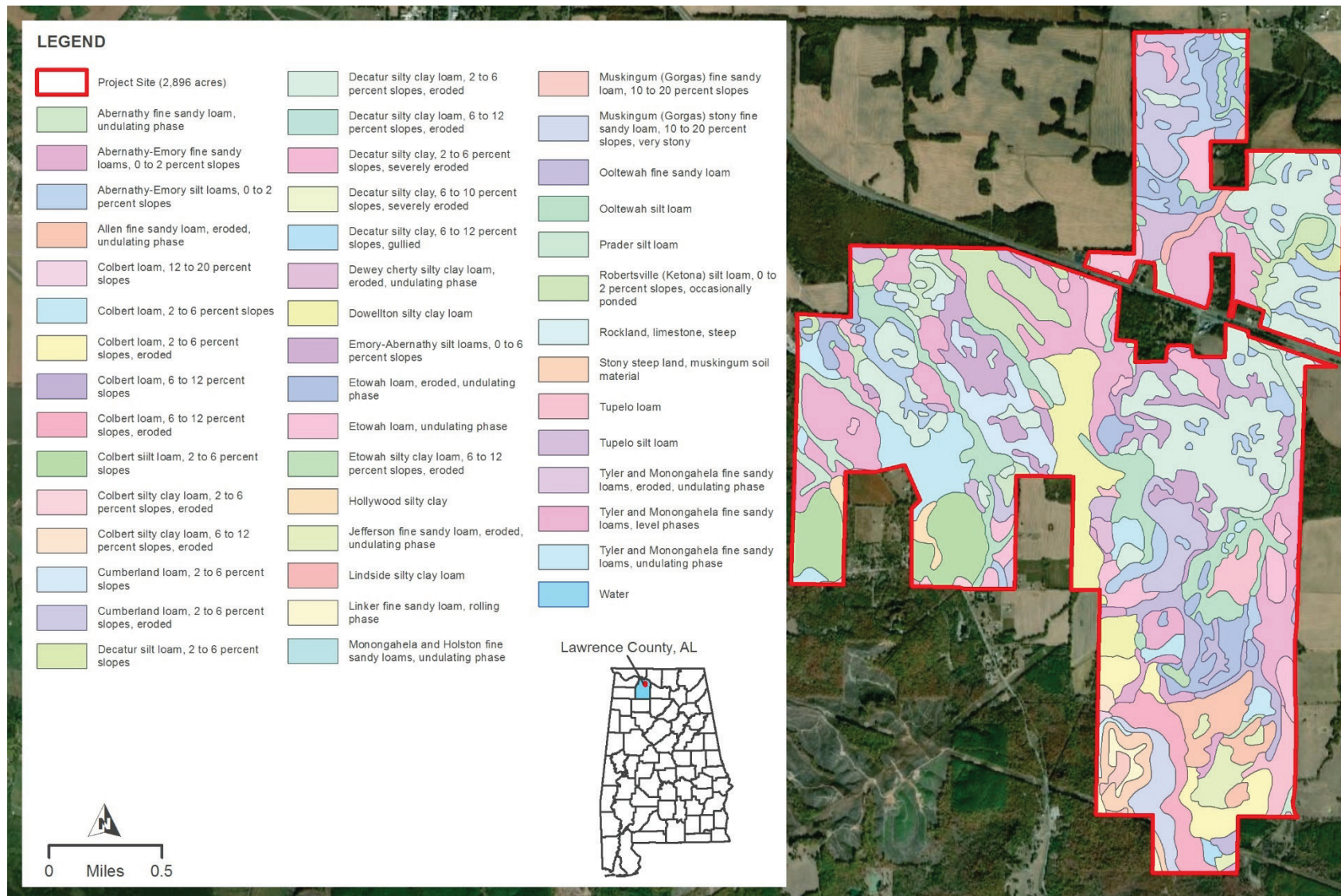
Soil type	Farmland classification	Hydric Rating	Area (acres)	Percentage of area
<b>Abernathy-Emory fine sandy loams, 0 to 2 percent slopes (Aa)</b>	All areas are prime farmland	0	26.3	0.9%
<b>Abernathy fine sandy loam, undulating phase (Ab)</b>	All areas are prime farmland	1	29.2	1.0%
<b>Abernathy-Emory silt loams, 0 to 2 percent slopes (Ac)</b>	All areas are prime farmland	0	153.0	5.3%
<b>Abernathy-Emory silt loams, 0 to 6 percent slopes (Ad)</b>	All areas are prime farmland	0	148.9	5.1%
<b>Allen fine sandy loam, eroded, undulating phase (Ah)</b>	All areas are prime farmland	0	64.1	2.2%
<b>Colbert loam, 6 to 12 percent slopes, eroded (Cf)</b>	Not prime farmland	5	57.7	2.0%
<b>Colbert loam, 2 to 6 percent slopes, eroded (Cg)</b>	Farmland of statewide importance	5	61.9	2.1%
<b>Colbert loam, 12 to 20 percent slopes (Ch)</b>	Not prime farmland	5	1.6	0.1%
<b>Colbert loam, 6 to 12 percent slopes (Ck)</b>	Not prime farmland	5	0.1	0.0%
<b>Colbert loam, 2 to 6 percent slopes (Cl)</b>	Farmland of statewide importance	5	92.7	3.2%
<b>Colbert silt loam, 2 to 6 percent slopes (Co)</b>	Farmland of statewide importance	2	111.0	3.8%
<b>Colbert silty clay loam, 6 to 12 percent slopes, eroded (Cr)</b>	Not prime farmland	1	4.8	0.2%
<b>Colbert silty clay loam, 2 to 6 percent slopes, eroded (Cs)</b>	Farmland of statewide importance	1	6.1	0.2%
<b>Cumberland loam, 2 to 6 percent slopes, eroded (Cv)</b>	All areas are prime farmland	0	124.8	4.3%

<b>Soil type</b>	<b>Farmland classification</b>	<b>Hydric Rating</b>	<b>Area (acres)</b>	<b>Percentage of area</b>
<b>Cumberland loam, 2 to 6 percent slopes (Cw)</b>	All areas are prime farmland	0	61.6	2.1%
<b>Decatur silt loam, 2 to 6 percent slopes (Da)</b>	All areas are prime farmland	0	8.6	0.3%
<b>Decatur silty clay loam, 6 to 12 percent slopes, eroded (Db)</b>	Farmland of statewide importance	0	1.9	0.1%
<b>Decatur silty clay loam, 2 to 6 percent slopes, eroded (Dc)</b>	All areas are prime farmland	0	429.9	14.8%
<b>Decatur silty clay, 6 to 12 percent slopes, gullied (Dd)</b>	Farmland of statewide importance	0	4.3	0.1%
<b>Decatur silty clay, 6 to 10 percent slopes, severely eroded (De)</b>	Not prime farmland	0	0.2	0.0%
<b>Decatur silty clay, 2 to 6 percent slopes, severely eroded (Df)</b>	Farmland of statewide importance	0	24.5	0.8%
<b>Dewey cherty silty clay loam, eroded, undulating phase (Dh)</b>	All areas are prime farmland	1	10.8	0.4%
<b>Dowellton silty clay loam (Dk)</b>	Farmland of statewide importance	90	120.0	4.1%
<b>Etowah loam, eroded, undulating phase (Ed)</b>	All areas are prime farmland	1	129.6	4.5%
<b>Etowah loam, undulating phase (Ee)</b>	All areas are prime farmland	1	122.7	4.2%
<b>Etowah silty clay loam, 6 to 12 percent slopes, eroded (Eg)</b>	Not prime farmland	0	4.1	0.1%
<b>Hollywood silty clay (He)</b>	All areas are prime farmland	1	14.8	0.5%
<b>Monongahela and Holston fine sandy loams, undulating phase (Hh)</b>	All areas are prime farmland	2	1.8	0.1%
<b>Jefferson fine sandy loam, eroded, undulating phase (Jc)</b>	All areas are prime farmland	0	33.0	1.1%
<b>Lindside silty clay loam (Lb)</b>	All areas are prime farmland	1	15.9	0.5%
<b>Linker fine sandy loam, rolling phase (Lg)</b>	Farmland of statewide importance	1	14.4	0.5%
<b>Tyler and Monongahela fine sandy loams, eroded, undulating phase (Mb)</b>	All areas are prime farmland	2	0.6	0.0%
<b>Tyler and Monongahela fine sandy loams, level phases (Mc)</b>	All areas are prime farmland	1	352.9	12.2%
<b>Tyler and Monongahela fine sandy loams, undulating phase (Md)</b>	All areas are prime farmland	2	27.5	1.0%
<b>Muskingum (Gorgas) fine sandy loam, 10 to 20 percent slopes (Me)</b>	Not prime farmland	0	8.2	0.3%
<b>Muskingum (Gorgas) stony fine sandy loam, 10 to 20 percent slopes, very stony (Mf)</b>	Not prime farmland	0	40.3	1.4%
<b>Ooltewah fine sandy loam (Oa)</b>	Farmland of statewide importance	90	59.4	2.1%
<b>Ooltewah silt loam (Ob)</b>	Farmland of statewide importance	90	198.0	6.8%

<b>Soil type</b>	<b>Farmland classification</b>	<b>Hydric Rating</b>	<b>Area (acres)</b>	<b>Percentage of area</b>
<b>Prader silt loam (Ph)</b>	Not prime farmland	90	75.5	2.6%
<b>Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded (Ra)</b>	Farmland of statewide importance	85	111.6	3.9%
<b>Rockland, limestone, steep (Rc)</b>	Not prime farmland	0	4.9	0.2%
<b>Stony steep land, muskingum soil material (Se)</b>	Not prime farmland	0	31.9	1.1%
<b>Tupelo loam (Tn)</b>	Not prime farmland	1	60.0	2.1%
<b>Tupelo silt loam (To)</b>	Farmland of statewide importance	1	44.3	1.5%
<b>Total Prime Farmland</b>			<b>1,756.6</b>	<b>60.7%</b>
<b>Total Farmland of Statewide Importance</b>			<b>850.1</b>	<b>29.4%</b>

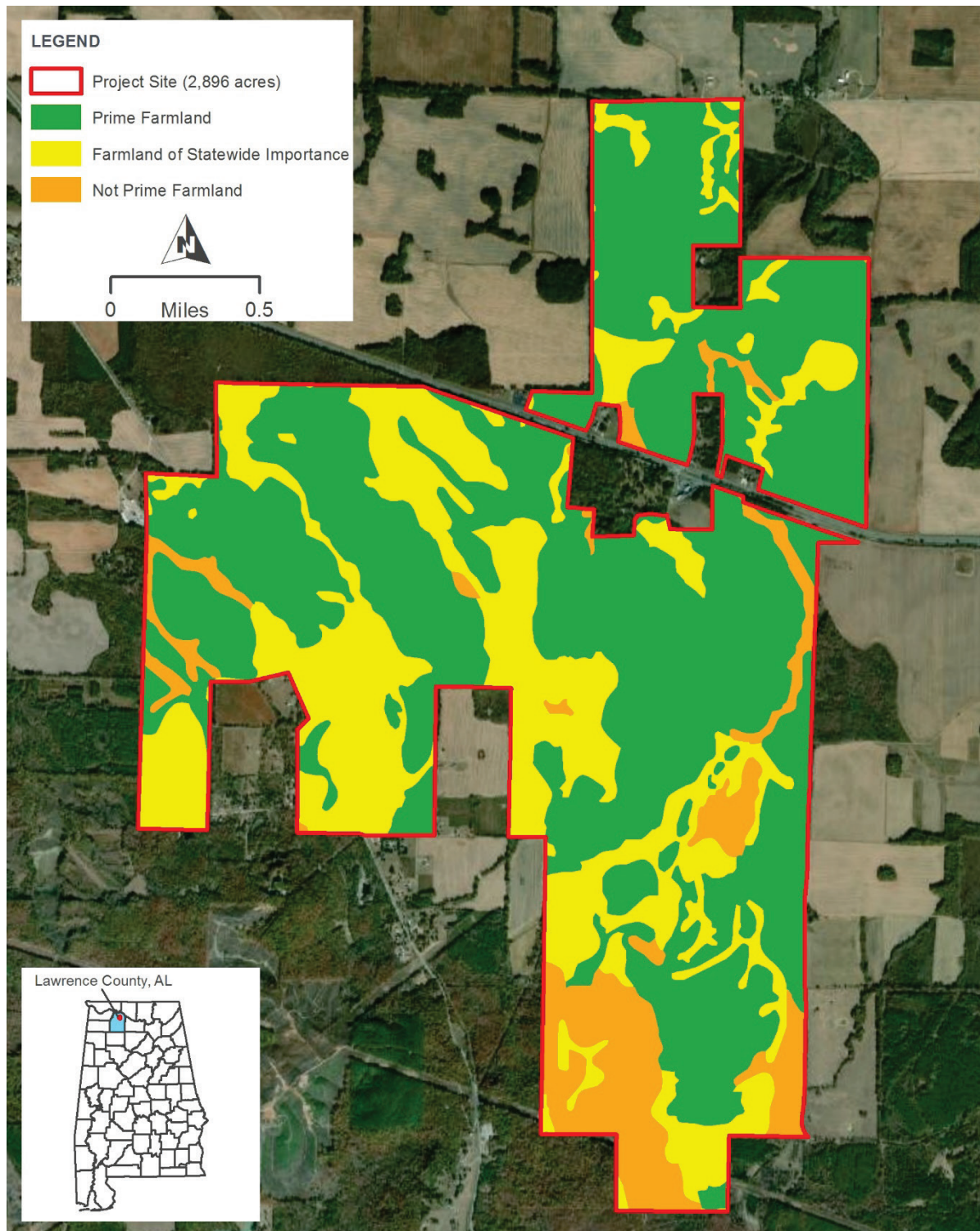
**Source:** USDA 2019a

The locations of prime farmland soils on the Project Site are shown on Figure 3-3. Based on information from USDA (2019a), prime farmland soils and soils of statewide importance occur on approximately 2,607 acres, constituting approximately 90 percent of the 2,896-acre Project Site. For comparison, prime farmland soils and soils of statewide importance occur on approximately 275,128 acres (60 percent) in Lawrence County.



**Figure 3-2. Soils on the Project Site**





**Figure 3-3. Soils classified as prime farmland on the Project Site**

### **3.3.2 Environmental Consequences**

This section describes the potential impacts to geologic resources, soils, and prime farmlands should the Proposed Action or No Action Alternative be implemented.

#### **3.3.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts on geological, paleontological, soil resources, or prime farmlands would result.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. TVA's interim management of the site would not affect geology, soils, or prime farmland. The potential future development and/or disposal of the site could affect these resources, particularly soils and prime farmland.

#### **3.3.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period. Direct impacts to geology, soil, and prime farmland resources would occur as a result of construction and operation of the Project.

Approximately half (1,459 acres) of the 2,896-acre Project Site would be cleared and/or graded for the solar facility, Project substation, BESS, and associated on-site interconnection facilities. Grading and clearing for the solar facility would cause minor, localized increases in erosion and sedimentation, resulting in minor impacts to geology and soils. Species-rich meadow zones would occupy up to 150 additional acres of the Project Site; however, minimal soil disturbance is anticipated in establishing these restoration zones. Array pilings and replacement TL structures would be driven into the ground to a depth of up to 20 feet and approximately 10 to 12 feet, respectively.

##### **3.3.2.2.1 Geology and Paleontology**

Under the Proposed Action, minor impacts to geology could occur. The solar arrays would be supported by steel piles, which would either be driven or screwed into the ground to a depth of up to 20 feet and may encounter bedrock given its depth at 18 feet in places. Replacement TL structures would be directly imbedded in holes where existing structures would be removed or newly augured into the ground to a depth equal to 10 percent of the pole's length plus an additional two feet, typically about 10 to 12 feet deep. Blasting of bedrock may be required to install pilings and pole structures. The Project would avoid compromising the structure integrity or altering the karst hydrology during the TL upgrades by controlled drilling and blasting within a 0.5-mile radius of documented caves.

Any on-site sedimentation basins would be shallow and, to the extent feasible, utilize the existing terrain without requiring extensive excavation. The PV panels would be connected with underground wiring placed in trenches three- to four-feet deep. Minor excavations would also be required for construction of the Project substation and to conduct other activities associated with the interconnection of the solar PV facility to TVA's existing electrical transmission network. Due to the small sizes of the subsurface disturbances, only minor direct impacts to potential subsurface geological resources are anticipated.

Should paleontological resources be exposed during site construction or operation activities, ground-disturbing work in the associated area would be halted, and a paleontological expert would be consulted to determine the nature of the paleontological resources, recover these resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy.

#### **3.3.2.2.2 Geologic Hazards**

Hazards resulting from geological conditions may be encountered in the case of sinkholes and seismic activity. The Project Site is located over limestone bedrock that is susceptible to erosion and the creation of sinkholes. The Project Site does have portions of three mapped sinkholes and/or topographic depressions; however, no signs of incipient sinkhole conditions were observed during an on-site geotechnical study (S&ME, Inc. 2021). Portions of the security fencing and a solar panel block would be constructed in the location of one of these mapped sinkholes. TVA's contractor would conduct a more detailed geotechnical study in order to design the facility to minimize effects from sinkholes. The Project Site has low risk for earthquakes that will cause structural damage. The Project would be designed to comply with applicable standards to minimize issues pertaining with sinkholes and seismic activity. Geologic hazard impacts on the site would be unlikely to impact off-site resources.

#### **3.3.2.2.3 Soils**

The facility construction would affect soils on 1,459 acres of the Project Site. Soil disturbance associated with the species-rich meadow zones, occupying up to 150 additional acres of the Project Site, would be minimal and largely result from the use of a seed drill or planter during initial establishment. None of the soils on the Project Site have characteristics that would require special construction techniques or other non-routine measures. TL upgrades may require improvements to existing access roads and may also require replacing TL structures; thus, additional soil impacts may occur in relation to that component of the Project. Impacts to soils associated with TL upgrades would be temporary and mitigated through BMPs identified in Section 2.2.3.1. Soils would be temporarily affected due to construction activities and tree-trimming and other maintenance activities during operation. Any stockpiled soils from the area where vegetation clearing and grading occurs, including topsoils, would be appropriately replaced following cut-and-fill activities to the extent practical and, therefore, likely not require any off-site or on-site hauling of soils. However, some minimal off-site or on-site hauling may be necessary.

Although not anticipated, should borrow material be required for Project Site activities, small amounts of sand and gravel aggregate may be obtained either from on-site activities within the 1,459-acre portion of the Project Site that would require clearing and some grading, or from local, off-site, permitted sources. The creation of approximately eight acres of new impervious surface, in the form of the foundations for the central inverters and the Project substation, BESS, and associated components, would result in a minor increase in stormwater runoff and potential increase in soil erosion. Planting of native and/or non-invasive vegetation within the limits of disturbance along with use of BMPs described in the CBMPP (see Section 1.4.1), such as soil erosion and sediment control measures, would minimize the potential for increased soil erosion and runoff. Following construction, implementation of soil stabilization and vegetation management measures would reduce the potential for erosion impacts during site operations.

During operation and maintenance of the solar facility and associated interconnection facilities, very minor disturbance would occur to soils. Routine maintenance would include



periodic motor replacement, inverter air filter replacement, fence repair, vegetation control, and periodic PV array inspection, repairs, and maintenance. The Project would implement mechanized landscaping using lawnmowers, weed eaters, and possibly grazing sheep. Where the developed solar facility would be located, trimming and mowing to maintain the vegetation at a height of approximately 18 inches would be performed as needed but estimated to occur no more than three times per growing season. Selective spot applications of herbicides may be employed around facilities and structures to control weeds. Herbicides would be applied by a professional contractor or a qualified Project technician. These maintenance activities would not result in any adverse impacts to soils on the Project Site during operations.

#### **3.3.2.2.4 Prime Farmland**

Should the Proposed Action be implemented, approximately half (1,459 acres) of the 2,896-acre Project Site would be developed into the North Alabama Utility-Scale Solar Facility and removed from potential agricultural uses other than grazing by sheep. This would affect approximately 1,074 acres of prime farmland and approximately 61 percent of the total prime farmland soils at the Project Site. An additional 150 acres of the Project Site outside of this acreage would be modified by the Project as species-rich meadow. Of the nearly 150 acres of the Project Site selected as potential for establishing native plant meadow, approximately 65 percent of the areas overlap prime farmland soils. This may remove additional prime farmland acreage from agricultural use but would not adversely affect its future agricultural use.

Effects on prime farmland soils would be reduced by the use of appropriate BMPs to control erosion and limit sediment and soil from leaving the Project Site. During grading, topsoil would be removed and stockpiled and, as grading is nearing completion, redistributed over the graded areas. Upon decommissioning, once the facility components are removed and the site is stabilized, farming could resume with little long-term loss of soil fertility and potential agricultural production.

In accordance with FPPA evaluation procedures, potential impacts to prime farmland were evaluated with the USDA Farmland Conversion Impact Rating Form (Form AD-1006) (Appendix A). Form AD-1006 quantifies the potential impacts to prime farmland. The impact rating considers the acreage of prime farmland to be converted, the relative abundance of prime farmland in the surrounding county, and other criteria such as distance from urban environments, percentage of area currently being farmed, and compatibility with existing agricultural use. This form assigns a numerical rating between zero and 260 based on the area of prime farmland to be disturbed, the total area of farmland in the affected county, and other criteria. The impact rating score for the Project Site was 174.6 (Appendix A). Sites with a total score of at least 160 have a greater potential to adversely affect prime farmland and, thus, require more detailed consideration of alternative sites, including the evaluation of sites that may have less effects on prime farmland. The site selection criteria for the proposed solar facility are described in Section 2.3. Although the development of the majority of the potential alternative sites may have resulted in less impacts on prime farmland than the Project Site (Table 2-1), impacts to wetlands and streams would likely have been greater and/or development was constrained by the presence of floodplains and adverse slope conditions.

Based on the ratings for the Project Site, effects on prime farmland would be adverse for the duration of the solar facility. Overall, the Project would impact approximately 1.1 percent of farmland in the county. Impacts to soils would otherwise be insignificant due to measures

to preserve topsoil and minimize erosion, such as installing silt fencing and balancing cut-and-fill quantities. Following the eventual decommissioning and removal of the solar facility, the Project Site could be returned to agricultural use with little loss of soil productivity and insignificant long-term effects on agricultural production. Adverse impacts to soil productively may also be offset by the beneficial effects to soil health of maintaining a permanent vegetative cover during facility operation.

### **3.4 Water Resources**

This section provides an overview of existing water resources in the project area and the potential impacts on these water resources that would be associated with the No Action and Proposed Action alternatives. Existing conditions for water resources are presented for the vicinity of the Project Site and the TL upgrade locations, where Project effects to these resource areas could occur. Components of water resources that are analyzed include groundwater, surface water and wetlands, and floodplains.

#### **3.4.1 Groundwater**

##### **3.4.1.1 *Affected Environment***

Groundwater is water located beneath the ground surface within soils and subsurface formations known as hydrogeological units or aquifers (USGS 2020d). Aquifers conduct groundwater and significant quantities of water to man-made water wells and natural springs. The Tuscumbia-Fort Payne aquifer underlies the project area and consists of limestone and chert beds.

The Tuscumbia-Fort Payne aquifer includes the Monteagle Limestone, Tuscumbia Limestone, and Fort Payne Chert. The aquifer name emphasizes the prominence of the Tuscumbia Limestone and the Fort Payne Chert which are the most prevalent sources of water within it. Monteagle Limestone is a significant source of water in only the southeastern part of the aquifer. The aquifer is recharged by water which infiltrates and percolates through the overlying unconsolidated material until it enters the bedrock and aquifer. The base of the aquifer consists of contact with the underlying Chattanooga Shale.

Water in the Tuscumbia-Fort Payne aquifer is partially confined because of the lower hydraulic conductivity of the overlying residual mantle. The Tuscumbia-Fort Payne aquifer is the most widely used aquifer for public water supply in the area. Large porous areas are present in several areas where dissolution has enlarged the joints and bedding-planes. Wells which penetrate these areas produce large quantities of water (Bosong 1987). Wells in the area have been documented with pumping rates from 100 to 1,000 gallons per minute (ADEM 2020a).

Groundwater moves easily through carbonate aquifers due to their non-uniform permeability and cavernous features. Such aquifers are referred to as anisotropic. Groundwater movement in anisotropic aquifers is affected primarily by gravity but also by the geometry of the confining fracture system. The cavernous features or large areas of porosity have been formed by solution processes in fractures and fracture systems at many places in the carbonate aquifers. If sufficient hydraulic gradient is present water can move quite rapidly through these fractures or systems of fractures (Bosong 1987). In a Project geotechnical study, groundwater levels were either not encountered or observed at depths ranging from seven to 20 feet (S&ME, Inc. 2021).

The Tuscumbia-Fort Payne aquifer shows groundwater movement northward toward the Tennessee River in the project area. Minor variations are generally related to topography. The trend is for groundwater to move from higher to lower topographic areas (Rutledge 2016).

#### **3.4.1.2 Environmental Consequences**

This section describes the potential impacts to groundwater should the No Action or Proposed Action alternative be implemented.

##### **3.4.1.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to groundwater would be expected to occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These actions would have negligible effects on groundwater. The potential future development and/or disposal of the site has a greater potential for affecting groundwater, although adherence to applicable regulations would reduce these effects.

##### **3.4.1.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Beneficial, indirect impacts to groundwater could result from the change in land use. This would include use of BMPs associated with hazardous materials, the reduced likelihood of erosion and sedimentation, the improvement of water quality by filtering through permanent native and/or non-invasive plant cover, including up to 150 acres of species-rich native plant meadow, and a reduction in fertilizer and pesticide runoff in comparison with current agricultural practices on the Project Site.

No direct adverse impacts to groundwater would be anticipated as a result of the Proposed Action. The PV panels, including those placed in the location of one mapped sinkhole, would have a relatively minor effect on groundwater infiltration and surface water runoff because the panels would not include a runoff collection system. Rainwater would drain off the panels to the adjacent vegetated ground just as they would under the No Action Alternative. Array spacing and panel movement throughout the day would prevent rain shadow effects.

Hazardous materials that could potentially contaminate groundwater would be stored on the Project Site during construction. The minimal use of petroleum fuels, lubricants, and hydraulic fluids during construction and by maintenance vehicles would result in a low potential for small on-site spills. However, the use of BMPs to properly maintain vehicles to avoid leaks and spills and procedures to immediately address any spills that did occur, would minimize the potential for adverse impacts to groundwater.

Project activities could potentially cause erosion during construction resulting in the movement of sediment into groundwater infiltration zones. BMPs, such as those described in TVA's BMP manual (TVA 2017a), would be used to avoid contamination of groundwater due to Project activities. However, once construction is complete and disturbed areas are re-vegetated, future erosion and sediment control would be minimized as opposed to the No Action Alternative where farming practices may contribute to increase erosion and sedimentation if limited or no BMPs are used.

Additionally, fertilizers and herbicides would be used sparingly during construction and revegetation, and in accordance with manufacturer's recommendations to avoid contamination of groundwater. While maintenance of the species-rich meadow would include selective herbicide applications, these would be reduced in comparison with the existing agricultural practices on the Project Site. Once revegetated, the need for future fertilizers and herbicides would be limited. Beneficial indirect impacts to groundwater could result from the change in land use due to decreased use of fertilizers and pesticides.

The Project would avoid impacts to groundwater by controlled TL upgrade-related drilling and blasting within a 0.5-mile radius of documented caves.

#### 3.4.1.2.2.1 Project Water Needs

Water and sewer services are anticipated as on-site needs during construction of the Project. Construction-related water use would support site preparation and grading activities. The primary use of water would be for compaction and dust control during grading and earthwork. Smaller quantities of water would be required for other minor uses.

Water used during construction would be provided via connection to a municipal source or delivered via water trucks. Sewer services would be provided via portable toilets. None of the proposed options for water and water-related needs would adversely affect available groundwater resources.

The primary uses of water during operation and maintenance would be for dust control, equipment washing and potential building restroom facilities. Internal access roads would not be heavily traveled during normal operation, and consequently, water use for dust control is anticipated to be limited if at all necessary. Precipitation in the area is adequate to minimize any buildup of dust and other matter on the PV panels that would reduce energy production; therefore, no regular panel washing is anticipated. The panels would be cleaned if a specific issue was identified or depending on the frequency of rainfall, proximity of arrays to sources of airborne particulates, and other factors.

Equipment washing and any potential dust control discharges would be handled in accordance with BMPs for water-only cleaning. Water needs during operation and maintenance would be provided either by connection to a municipal source or by delivery via water trucks and would not adversely affect groundwater resources.

Conditions may change by the time facility closure and decommission becomes necessary. A final Decommissioning and Closure Plan would be created based on site conditions at the time of facility closure.

The Project would comply with NPDES requirements by preparing and implementing a CBMPP and filing a Notice of Intent (NOI) to comply with the General Construction Stormwater NPDES Permit. The plan would include procedures to be followed during

decommissioning to prevent erosion and sedimentation, non-stormwater discharges, and contact between stormwater and potentially polluting substances.

Decommissioning and site reclamation would likely be staged in phases, allowing for a minimal amount of disturbance and requiring minimal dust control and water usage. It is anticipated that water usage during decommissioning and site reclamation would not exceed construction or operational water usage.

#### 3.4.1.2.2 Overall Groundwater Impacts

Due to the small volume of groundwater anticipated to be needed for the Project, impacts to the local aquifers and groundwater in general are not anticipated. The use of BMPs and a CBMPP would reduce the possibility of any on-site hazardous materials reaching the groundwater during operation or maintenance. Overall, impacts to groundwater would not be anticipated.

Indirect beneficial impacts to groundwater could occur if panel placement and/or the use of buffer zones lead to fewer pollutants and erosion products entering groundwater. Currently, most of the on-site land use is agricultural, which provides for the possibility of fertilizer and pesticide to runoff and percolate into the groundwater. The construction and operation of the Proposed Action would reduce or eliminate the use of fertilizer, and pesticides the source of these impacts, resulting in a beneficial, though minor, indirect impact to groundwater.

### 3.4.2 Surface Water and Wetlands

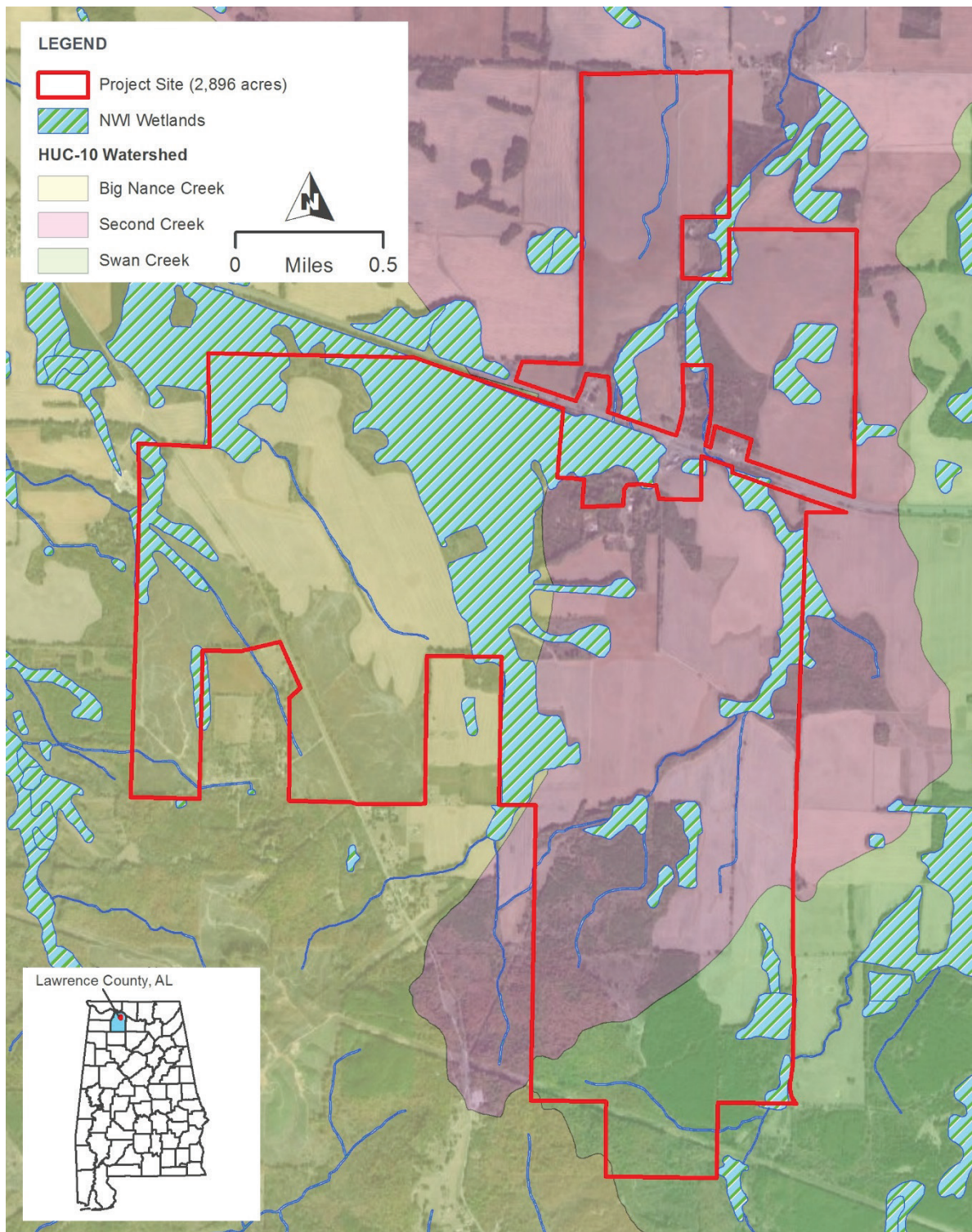
#### 3.4.2.1 *Affected Environment*

##### 3.4.2.1.1 Regional Setting

The Project Site is situated across three 10-digit hydrologic unit code (HUC-10) sub-basins of the Tennessee Region HUC-6 watershed: Big Nance Creek (0603000501), Second Creek (0603000212), and Swan Creek (0603000201) (Figure 3-4; USGS 1987; USGS 2020e). On-site surface waters in the northern portion of the Project Site drain to Second Creek. On-site surface waters in the southern portion of the Project Site split to all three watersheds. The western area drains to Big Nance Creek, the eastern/central portion drains to Second Creek and the lower southeastern portion drains to Swan Creek. These creeks generally flow northward and join with the Wheeler Reservoir portion of the Tennessee River.

The TL upgrade locations are situated across two HUC-10 sub-basins of the Tennessee Region HUC-6 watershed: Swan Creek (0603000201) and a small portion of Flint Creek (0603000210) (Figure 3-8). On-site surface waters in the northern portion of the TL upgrade locations drain to Mallard Creek. On-site surface waters in the southern portion of the TL upgrade locations split to two watersheds. The western/central area drains to Dry Branch Creek, and the eastern portion drains to Flint Creek. These creeks generally flow to the Tennessee River.

Precipitation in the project area averages about 54 inches per year. Stream flow varies with rainfall and averages 24.6 inches of runoff per year, approximately 1.8 cubic feet per second, per square mile of drainage area (USGS 2008).



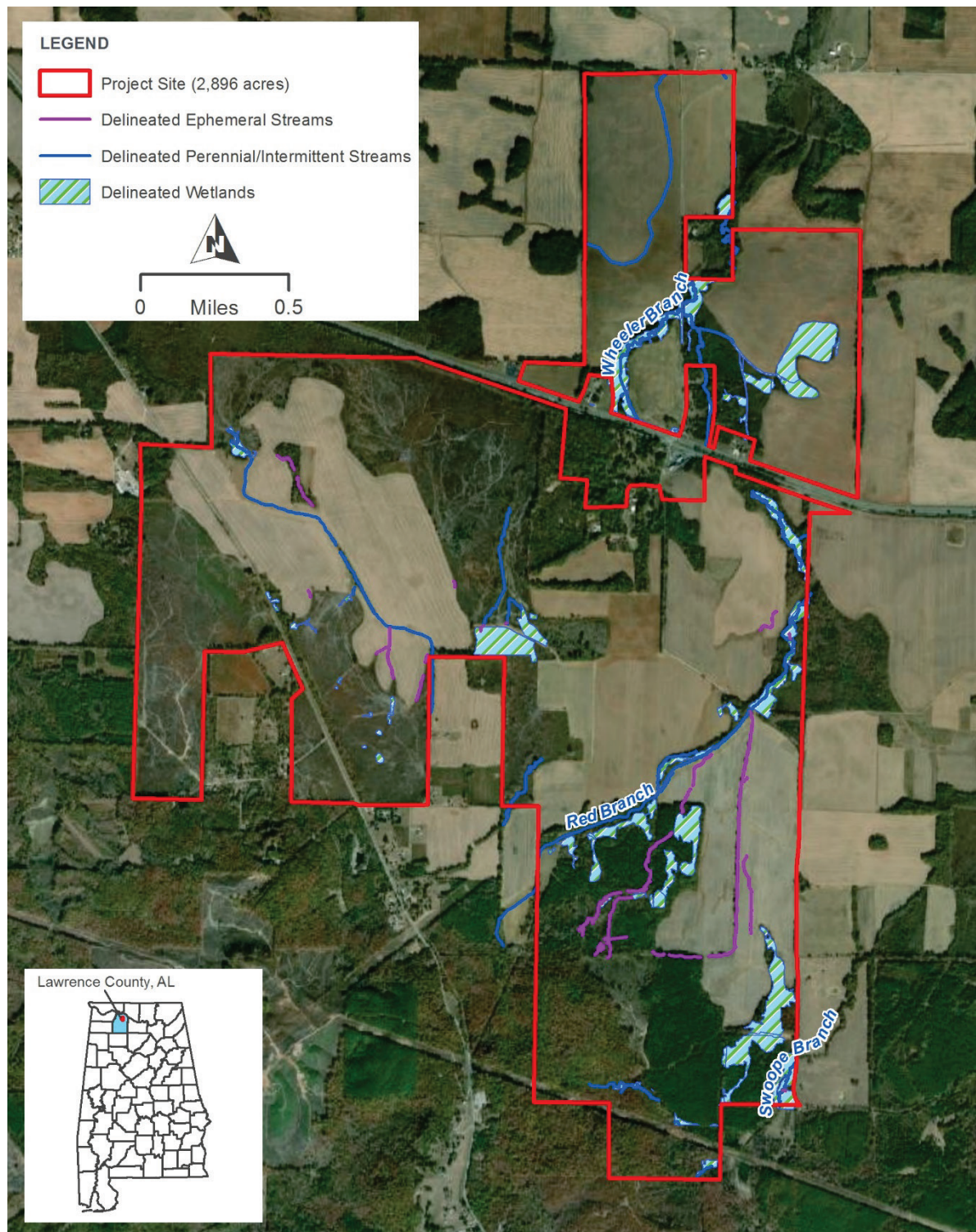
**Figure 3-4. NWI wetlands and HUC-10 watersheds in the Project Site vicinity**

#### **3.4.2.1.2 Surface Water**

Surface water is any water that flows above ground and includes, but is not limited to, streams, ponds, lakes, and wetlands. Streams can be further classified as perennial, intermittent, or ephemeral based on the occurrence of surface flow. Surface waters with certain physical and hydrologic characteristics (defined bed and bank, ordinary high-water mark, or specific hydrologic, soil, and vegetation criteria) are considered Waters of the U.S. (or jurisdictional waters) and are under the regulatory jurisdiction of USACE. The CWA is the primary federal statute that governs the discharge of pollutants and fill materials into Waters of the U.S. under Sections 401, 402, and 404. The limits of Waters of the U.S. are defined through a jurisdictional determination approved of by USACE. State agencies have jurisdiction over water quality. Impacts to jurisdictional waters that do not exceed 0.5 acre would fall under certain CWA Section 404 NWP and be authorized or permitted as described in Section 1.4.2. If the overall impacts to jurisdictional wetlands and streams were to exceed 0.5 acre, an Individual Permit would be obtained to authorize impacts to Waters of the U.S.

Field surveys conducted in January, March, and August 2020 on the potentially disturbed portion of the Project Site documented a total of 10 perennial streams, 11 intermittent streams, 20 ephemeral streams, and six ponds (Appendix A), which includes approximately 65,000 linear feet (LF) of perennial and intermittent streams and approximately 21,504 LF of ephemeral streams. Figure 3-5 depicts the delineated perennial and intermittent streams, ephemeral streams, and wetlands, which are discussed in the section below. Named streams on and downstream of the Project Site, as well as their use classifications are given in Table 3-2.





**Figure 3-5. Aerial photo showing delineated wetlands and streams on the Project Site**



The CWA requires all states to identify all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards and to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. States are required to submit reports to USEPA with these data. The term “303(d) list” refers to the list of impaired and threatened streams and water bodies identified by the state. No streams on the Project Site are currently listed as impaired. Of the streams in the Project Site vicinity, Spring Creek is listed as impaired for nutrients due to agriculture causes. The Tennessee River/Wheeler Reservoir is listed as impaired for nutrients due to agricultural causes and perfluorooctane sulfonic acid due to industrial causes (ADEM 2020b). Table 3-2 provides a listing of local streams with their state designated uses (ADEM 2017).

**Table 3-2. Streams in the Project Site vicinity and their uses**

Stream	Use Classification <sup>1</sup>		
	PWS	S	F&W
<b><u>Tennessee River/Wheeler Reservoir<sup>2</sup></u></b>	X	X	X
Spring Creek <sup>2</sup>	X	X	X
Red Branch			X
Wheeler Branch			X
Prairie Creek			X
Mallard Creek <sup>2</sup>			X
Swoope Branch			X

<sup>1</sup>Codes: PWS= Public Water Supply; S= Swimming and Other Whole-Body Water Contact Sports; F&W= Fish and Wildlife

<sup>2</sup> Stream located in the Project vicinity, but not located within the Project Site

The proposed TL upgrades are located within the Swan Creek (HUC-10 0603000201) watershed. A field survey of the TL upgrade locations was conducted in December 2021. A total of 10 perennial/intermittent streams, 12 ephemeral streams, and four ponds were delineated within the TL study area. The surface water streams in the vicinity of the TL upgrades are listed in Table 3-3.

**Table 3-3. Streams in the vicinity of the TL upgrade locations and their uses**

Stream	Use Classification <sup>1</sup>		
	PWS	S	F&W
<b><u>Tennessee River/Wheeler Reservoir<sup>2</sup></u></b>	X	X	X
Fox Creek			X
Dry Branch			X
Mallard Creek			X
Swoope Branch			X
Prairie Creek			X
Turkey Creek			X

<sup>1</sup>Codes: PWS = Public Water Supply; S = Swimming and Other Whole-Body Water Contact Sports; F&W = Fish and wildlife

<sup>2</sup> Stream located in the Project vicinity, but not located within the Project Site

### 3.4.2.1.3 Wetlands

Wetlands are areas saturated by surface or groundwater at a frequency and duration sufficient to support vegetation adapted to saturated conditions. Examples of wetlands are bottomland forests, swamps, wet meadows, isolated depressions, and shoreline fringe along watercourses or impoundments (33 CFR § 328.3). Wetland habitat provides valuable public benefits including flood storage, erosion control, water quality improvement, wildlife habitat, and recreation opportunities.

In the Interior Plateau Level III ecoregion (USEPA 2017), wetlands are composed of palustrine systems. Palustrine systems are non-tidal or freshwater complexes, dominated by trees, shrubs, or persistent emergent vegetation (Cowardin et al. 1979). Palustrine wetlands within this region can include bottomland or riparian hardwood forests, scrub-shrub wetlands, beaver ponds, or emergent wetlands typically composed of wet meadows and marshes.

The NWI was consulted for the Project Site and the TL upgrade locations. This nationwide dataset depicts potential wetland areas based on wetland signatures determined through aerial photography. The NWI indicates wetland cover ranges from five to 14 percent across the full extent of the three watersheds associated with the Project Site (Table 3-4). The portion of the Project Site within each of the three watersheds contained slightly over double the percent cover of NWI wetlands relative to the larger watershed area (Table 3-4). Therefore, based on NWI data, the Project Site contains a large percentage of wetland resources compared to the surrounding landscape. The northern portion of the Project Site contains 81 wetland acres mapped by NWI, and the southern portion of the Project Site contains 710 wetland acres mapped by NWI, for a total of 791 acres of NWI wetland area on the Project Site. The NWI wetland area accounts for 27 percent of the Project Site.

**Table 3-4. NWI wetland cover by watershed relative to NWI wetland cover on the Project Site**

<b>Watershed Name (HUC-10) --Solar Site Tributary Name</b>	<b>Total NWI Wetland Cover by Watershed</b>	<b>NWI Wetland Cover on the Project Site by Watershed</b>
Big Nance Creek (0603000501) --Wheeler Branch Tributary	12%	56%
Second Creek (0603000212) --Wheeler & Red Branch Tributary	5%	11%
Swan Creek (0603000211) --Swoope Creek Tributary	14%	16%

Source: USFWS 2017

Wetlands in the TL upgrade locations contain low-growing, emergent wetland vegetation. Desktop review of the NWI, topographic maps, county soil survey data, and aerial photography was conducted to estimate wetland extent in the TL upgrade locations. The review identified 12 separate wetland features, together encompassing approximately 30 acres. One wetland area identified by desktop review contains known occurrences of federally and state-listed plants between three structures and two spans, as discussed in Section 3.5.4.

3.4.2.1.3.1 Field Survey of the Project Site

A wetland field assessment was conducted of a 2,244-acre area, including the 1,459-acre disturbance footprint, between January and August 2020 to delineate and field verify wetland areas on the Project Site (Appendix A). Wetland determinations were performed according to USACE standards, which require documentation of hydrophytic (wet-site) vegetation, hydric soil, and wetland hydrology (Lichvar et al. 2016; USACE 1987, 2012). While desktop reviewed, some timbered areas and large wetlands in the Wheeler Branch basin in the southern portion of the Project Site, together totaling approximately 652 acres, were eliminated from development consideration prior to the field surveys; thus, these areas were not included in the survey.

Within the 2,244-acre survey area, a total of 125.41 wetland acres were identified on the Project Site, with 43.15 wetland acres located in the northern portion of the Project Site and 82.26 wetland acres located in the southern portion of the Project Site (Figure 3-5). Identified wetlands consist of bottomland habitat associated with three perennial streams: Wheeler Branch, Red Branch, and Swoope Branch. Wetland types consist of forested; scrub-shrub; emergent that have naturalized; emergent roadside, all of which occur along US 72A; emergent that are farmed or alongside crop fields; and pine timber, which are small and scattered isolated wetland depressions resulting from timber operations (Table 3-5).

**Table 3-5. Delineated wetland acreage by habitat and drainage basin on the Project Site**

Wetland Habitat Type	Northern Portion of Project Site			Total
	Wheeler Branch Drainage Basin	Red Branch Drainage Basin	Swoope Branch Drainage Basin	
Forested Wetland	17.22	3.90	0	<b>21.12</b>
Scrub-shrub Wetland	0.00	16.82	0	<b>16.82</b>
Emergent Wetland, Naturalized	1.69	1.88	0	<b>3.57</b>
Emergent Wetland, Roadside	0.33	0.00	0	<b>0.33</b>
Emergent Wetland, Farmed	0.96	0.35	0	<b>1.31</b>
Pine Timber Wetland	0.00	0.00	0	<b>0.00</b>
<b>Subtotal</b>	<b>20.20</b>	<b>22.95</b>	<b>0</b>	<b>43.15</b>
Wetland Habitat Type	Southern Portion of Project Site			Total
	Wheeler Branch Drainage Basin	Red Branch Drainage Basin	Swoope Branch Drainage Basin	
Forested Wetland	3.00	33.34	19.42	<b>55.76</b>
Scrub-shrub Wetland	0.48	0.39	0.00	<b>0.87</b>
Emergent Wetland, Naturalized	14.14	1.72	2.07	<b>17.93</b>
Emergent Wetland, Roadside	0.00	0.00	0.00	<b>0.00</b>
Emergent Wetland, Farmed	0.00	0.24	0.02	<b>0.26</b>
Pine Timber Wetland	0.00	0.00	7.44	<b>7.44</b>
<b>Subtotal</b>	<b>17.62</b>	<b>35.69</b>	<b>28.95</b>	<b>82.26</b>
<b>GRAND TOTAL</b>	<b>37.82</b>	<b>58.64</b>	<b>28.95</b>	<b>125.41</b>

Using a TVA-developed modification of the Ohio Rapid Assessment Method (Mack 2001) specific to the TVA region (TVA Rapid Assessment Method or "TVARAM"), wetlands on the Project Site were evaluated by their functions and classified into three categories: low quality, moderate quality, and high quality. Low-quality wetlands are degraded aquatic resources that may exhibit low species diversity, minimal hydrologic input and connectivity, recent or on-going disturbance regimes, and/or predominance of non-native species. These wetlands provide low functionality and are considered of low value. Moderate-quality wetlands provide functions at a greater value due to less degradation and/or due to their habitat, landscape position, or hydrologic input. Moderate-quality wetlands are considered healthy water resources of value. Disturbance to hydrology, substrate and/or vegetation may be present to a degree at which valuable functional capacity is sustained and there is reasonable potential for restoration. High-quality wetlands offer superior functions and values within a watershed or are of regional/statewide concern. These wetlands may exhibit little to no recent disturbance, provide substantial large-scale stormwater storage, sediment retention, and toxin absorption, contain mature vegetation communities, or offer habitat to rare species. Conditions in high-quality wetlands often represent restoration goals for wetlands functioning at a lower capacity.

Wetlands on the Project Site range from low to high quality (Table 3-6). Low-quality wetlands typically include isolated features or heavily disturbed, farmed wetlands. These were small and lacked influence on downstream water quality. Wetlands in stream floodplains primarily represent moderate quality habitat, exhibiting a healthy condition and desirable suite of wetland functions. Due to the geomorphic position and large size, these wetlands offer value in flood reduction, sediment retention, and toxin absorption. However, disturbance has resulted in some reduction of functional capacity due to narrow upland buffers, beaver presence, invasive species cover, or timber operations that have impacted natural wetland integrity. Although some disturbance may be present, the majority of the wetlands on site were considered moderate quality, providing healthy wetland functions to the surrounding landscape.

High-quality wetlands were identified along Wheeler Branch on the northern portion of the Project Site, where the state-protected, imperiled Tuscumbia darter and the globally rare round-rib elimia were identified within that stream reach (see Section 3.5.4). This wetland area contains mature trees, less cover of invasive species, substantial hydrologic input and discharge, natural flood patterns, and habitat interspersions.

**Table 3-6. Delineated wetland acreage by wetland condition within each drainage basin in the project area**

Wetland Condition TVARAM Category <sup>1</sup>	Northern Portion of Project Site			Total
	Wheeler Branch Drainage Basin	Red Branch Drainage Basin	Swoope Branch Drainage Basin	
Low Quality	2.11	0	0	<b>2.11</b>
Moderate Quality	2.24	22.95	0	<b>25.17</b>
High Quality	15.85	0	0	<b>15.85</b>
<b>Subtotal</b>	<b>20.20</b>	<b>22.95</b>	<b>0</b>	<b>43.15</b>
Wetland Condition TVARAM Category <sup>1</sup>	Southern Portion of Project Site			Total
	Wheeler Branch Drainage Basin	Red Branch Drainage Basin	Swoope Branch Drainage Basin	
Low Quality	4.07	0.91	0.62	<b>5.60</b>
Moderate Quality	13.55	34.79	28.32	<b>76.66</b>
High Quality	0.00	0.00	0.00	<b>0.00</b>
<b>Subtotal</b>	<b>17.62</b>	<b>35.70</b>	<b>28.94</b>	<b>82.26</b>
<b>GRAND TOTAL</b>	<b>37.82</b>	<b>58.65</b>	<b>28.94</b>	<b>125.41</b>

<sup>1</sup>TVARAM = Tennessee Valley Authority Rapid Assessment Method scores wetland quality by functional capacity

#### 3.4.2.1.3.1.1 Delineated Wetlands in the Northern Portion of the Project Site

The northern portion of the Project Site contains wetlands within two of the on-site drainage basins: Wheeler Branch and Red Branch. The entirety of this portion of the Project Site was field surveyed, and all wetlands were assessed and delineated during the ground survey (Table 3-5, Table 3-6, Figure 3-5, Appendix A).

The Wheeler Branch basin in the northern portion of the Project Site contains 20.20 acres of wetland, which is predominantly forested (17.22 acres). This floodplain wetland contains beaver habitat at its northernmost reach in the Project Site. Beavers in that area created a pond network and altered the hydrology accordingly. This floodplain area is forested, dominated by cherry bark oak and sugarberry.

Farther upstream, to the south, where Wheeler Branch crosses CR 377, the state-protected Tuscumbia darter and the globally rare round-rib elimia were observed (see Section 3.5.4). The forested wetland in this portion of the Project Site is dominated by sweetgum, with lesser but equal coverage of sycamore and green ash. The Wheeler Branch wetland complex includes some farmed wetland area (0.33 acre) along its border, where wetland hydrology has resulted in wetland soil coloration in cropland habitat. At US 72A, where Wheeler Branch flows northward, into the northern portion of the Project Site, the floodplain wetland complex is a mosaic of emergent and forested wetland habitat. Emergent wetland habitat (1.69 acres) has formed in the shallows of the creek bed and includes cattails, soft pathrush, and parrotweed.

The majority of the Wheeler Branch floodplain between US 72A and CR 377 is forested, with sweetgum and cherry bark oak continuing to be dominant overstory components. Other wetland habitat within this basin consists of emergent and forested wetland depressions (0.96 acre) along US 72A and CR 377. All wetlands in the northern portion exhibited inundated or saturated soils. Upland vegetative buffers are lacking, and surrounding land use is disturbed due to adjacent row cropping. However, the floodplain system was considered intact, receiving and discharging significant hydrology, and providing habitat for the rare Tuscumbia darter and round-rib elimia. Therefore, the majority of the Wheeler Branch floodplain wetland complex (15.85 acres) in the northern portion of the Project Site was assessed as providing high wetland function and value to the surrounding landscape.

The Red Branch floodplain in the northern portion of the Project Site contains relatively little wetland habitat, consisting of one vernal pool wetland depression within the riparian corridor and another small streamside flat, both forested. However, a considerable amount of wetland area was identified to the east of Red Branch, along an unnamed tributary to Red Branch. A large wetland depression composes most of the Red Branch basin wetland in the northern portion of the Project Site. This large depression, among other smaller depressions, drains to Red Branch through linear wetland swales. The wetland area within the large and smaller depressions and associated swales consists of scrub-shrub habitat with some emergent wetland habitat present. Scrub-shrub wetland (16.82 acres) is dominated by wetland saplings, including sweetgum, sugarberry, cherry bark oak, and green ash. Emergent wetland (1.88 acres) is generally dominated by soft pathrush, cattails, woolgrass, Frank's sedge, and/or giant goldenrod. Forested wetland area (3.90 acres) in the Red Branch basin in the northern portion of the Project Site contains an overstory of sugarberry, green ash, and sweetgum. Farmed wetland (0.35 acre) is in two locations peripheral to naturalized wetland habitat.

All of the wetlands in the northern portion of the Project Site exhibit saturated or inundated soils, with soil coloration indicative of hydric conditions. The scrub-shrub wetland area is considered early successional habitat, as is evidenced by the dominance of saplings, which reflects recent disturbance. Likewise, upland vegetated buffer areas are minimal, and adjacent land use is intense due to row cropping. However, the size of these wetlands and the associated hydrologic influence are important, and generally, the wetlands in the

northern portion of the Project Site offer desirable wetland functions and values within this watershed.

#### *3.4.2.1.3.1.2 Delineated Wetlands in the Southern Portion of the Project Site*

The southern portion of the Project Site contains wetlands within all three drainage basins. Due to Project avoidance of some areas, as described above, approximately 71 percent of this portion of the Project Site was field surveyed, and all wetlands in the survey area were assessed and delineated during the ground survey (Table 3-5, Table 3-6, Figure 3-5, Appendix A).

The Red Branch floodplain, upstream from the Red Branch floodplain in the northern portion of the Project Site, contains a total of 35.69 wetland acres. This acreage consists largely of forested wetland (33.34 acres) within the riparian corridor of Red Branch, dominated by green ash, sycamore, sweetgum, and willow oak. Scrub-shrub wetland (0.39 acre) was identified within an existing TVA TL ROW; these wetland areas are dominated by elderberry and sweetgum saplings. Emergent wetland associated with Red Branch on the southern portion of the Project Site (1.72 acres) consists of tributary wetland swales and mowed wetland flats dominated by wetland grasses, sedges, flat nutsedge, rushes, and forbs (herbaceous plants). A limited extent of farmed wetland (0.24 acre) was identified adjacent and associated with the Red Branch floodplain. All wetlands in the Red Branch basin in the southern portion of the Project Site exhibited wetland hydrology, with grey and mottled soil coloration, indicative of hydric conditions. Farmed or otherwise disturbed wetland habitat (0.91 acre) was assessed as low quality, offering poor wetland functions. Similar to the northern portion of the Project Site, upland vegetative buffers are minimal, and adjacent land use is intense due to row cropping. Additionally, the presence of invasive Chinese privet makes up portions of the forested wetland understory. However, due to the size of this floodplain wetland complex, its associated hydrologic influence, and coupled with mature forest habitat, the majority of the wetland area (34.79 acres) in this basin are moderate quality.

The Swoope Branch floodplain and extended basin are located in the southeast corner of the southern portion of the Project Site, containing 28.95 acres of delineated wetland habitat. Much of this wetland area is forested (19.42 acres), dominated by sweetgum and cherry bark oak, with a lesser but equal presence of willow oak, sugarberry, and loblolly pine. Emergent wetland (2.07 acres) was identified on existing farm road crossings or cleared areas adjacent to a pine plantation. This drainage basin contains a small, farmed wetland depression (0.02 acre) within a farm field where water pools prior to entering the adjacent forested wetland complex. Pine plantation wetland (7.44 acres) was identified in association with the Swoope Branch basin. This wetland is dominated by mature loblolly pine, with a significant presence of sweetgum cover in the overstory. This wetland includes a linear wetland drain extending from the southern portion of the Project site, feeding the larger pine plantation wetland flat.

Recently disturbed wetland habitat (0.62 acre) within the Swoope Branch basin was assessed as low quality, offering poor wetland functions. The remainder of the wetland area on site (28.32 acres) was assessed as moderate quality, offering desirable wetland functions and values within this watershed. Wetlands in this area scored as moderate quality due to minimal upland vegetative buffers, land use practices adjacent to the wetland (row cropping) or within the wetland (pine plantation), and disturbance regime coupled against the size and hydrologic influence these wetlands offer downstream water quality.

Areas within the Wheeler Branch basin located in the southern portion of the Project Site were not surveyed due to Project avoidance of the large NWI areas mapped in this location. Therefore, the majority of the Wheeler Branch floodplain wetland along US 72A in the southern portion of the Project Site was not included in the field survey. The portion remaining within the review area footprint contained 17.62 acres of total wetland, which is predominantly naturalized emergent wetland habitat at the southern extent of the Wheeler Branch floodplain. The remaining wetland habitat consisted of scattered forested, scrub-shrub, and emergent wetland depressions remaining after timber harvesting operations. Emergent wetland habitat (14.14 acres) is dominated by soft pathrush, woolgrass, Frank's sedge, and green bulrush. Forested (3.00 acres) and scrub-shrub (0.48 acre) wetlands are dominated with sweetgum, sugarberry, and loblolly pine trees and saplings. The scattered, isolated depression wetlands (4.07 acres) were assessed as low quality, offering poor wetland function due to their small size, recent disturbance, and lesser influence on downstream water quality. Wetland habitat associated with the Wheeler Branch floodplain (13.55 acres), due to size and hydrologic influence, was assessed as moderate quality, contributing desired wetland functions and values within the watershed.

#### 3.4.2.1.3.2 Field Survey of the TL Upgrade Locations

A wetland field assessment was conducted on the TL upgrade locations in November 2021, to delineate and field verify wetland areas on the Project Site (Appendix A). Wetland determinations were performed according to USACE standards (Environmental Laboratory 1987; Lichvar et al. 2016; USACE 2012). Within the TL survey area, a total of 14.15 wetland acres were identified. Of these wetlands, there were 25 palustrine emergent wetlands (13.92 acres) and two palustrine scrub-shrub wetlands (0.23 acre).

Wetlands in the TL upgrade locations were evaluated by their functions and classified into low-quality (Score 0 to 29), moderate-quality (Score 30 to 59), and high-quality (Score 60 to 100) categories, as described in Section 3.4.2.1.3.1. Wetlands in the TL upgrade locations consist of 24 low-quality wetlands (12.05 acres) and three moderate-quality wetlands (2.01 acres).

#### **3.4.2.2 Environmental Consequences**

This section describes the potential impacts to surface waters and wetlands should the Proposed Action or No Action Alternative be implemented.

##### **3.4.2.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to surface waters or wetlands would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These interim actions would have negligible effects on surface waters and wetlands. The potential thinning of the vegetative buffer along Wheeler Branch, as described in Section 2.5, would reduce the shading of the stream, likely resulting in a small increase in water temperature. The effects of this on water quality would likely be minimal. The potential future development and/or disposal of the site could adversely affect surface waters and wetlands, although these effects would be reduced through compliance with applicable regulations.



#### 3.4.2.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Soil disturbances associated with Project construction activities can result in adverse water quality impacts. Soil erosion and sedimentation can impact surface water quality. Construction activities would be performed using BMPs to minimize these impacts. TVA would comply with all appropriate local, state, and federal permit requirements. All proposed Project activities would be conducted in a manner to ensure that waste materials are contained, and that the introduction of pollutants to the receiving waters would be minimized.

As discussed in Section 1.4.1, an NPDES Construction Storm Water General permit (Permit ALR100000) would be needed since more than one acre would be disturbed for the Project. The permit also requires the development and implementation of a CBMPP. In addition, either NWP(s) or an Individual Permit would be required from USACE and 401 WQCs from ADEM for road crossings and other water feature disturbances affecting Waters of the U.S., including perennial and intermittent streams and wetlands. TVA is also subject to EO 11990, Protection for Wetlands. EO 11990 requires federal agencies to avoid wetland impacts to the extent practicable; minimize wetland destruction, loss, or degradation; and preserve and enhance natural and beneficial wetland values while carrying out agency responsibilities. EO 11990 further states that unavoidable impacts to streams and wetlands should be compensated through a process known as compensatory mitigation. BMPs, as described in TVA's BMP manual (TVA 2017a) and *The Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas* (ASWCC 2018), would be used to avoid contamination of surface water on and downstream of the Project Site. The use of BMPs for controlling soil erosion and runoff would minimize these potential impacts to surface water. Additionally, construction of on-site stormwater detention basins would allow sediment to settle out prior to release.

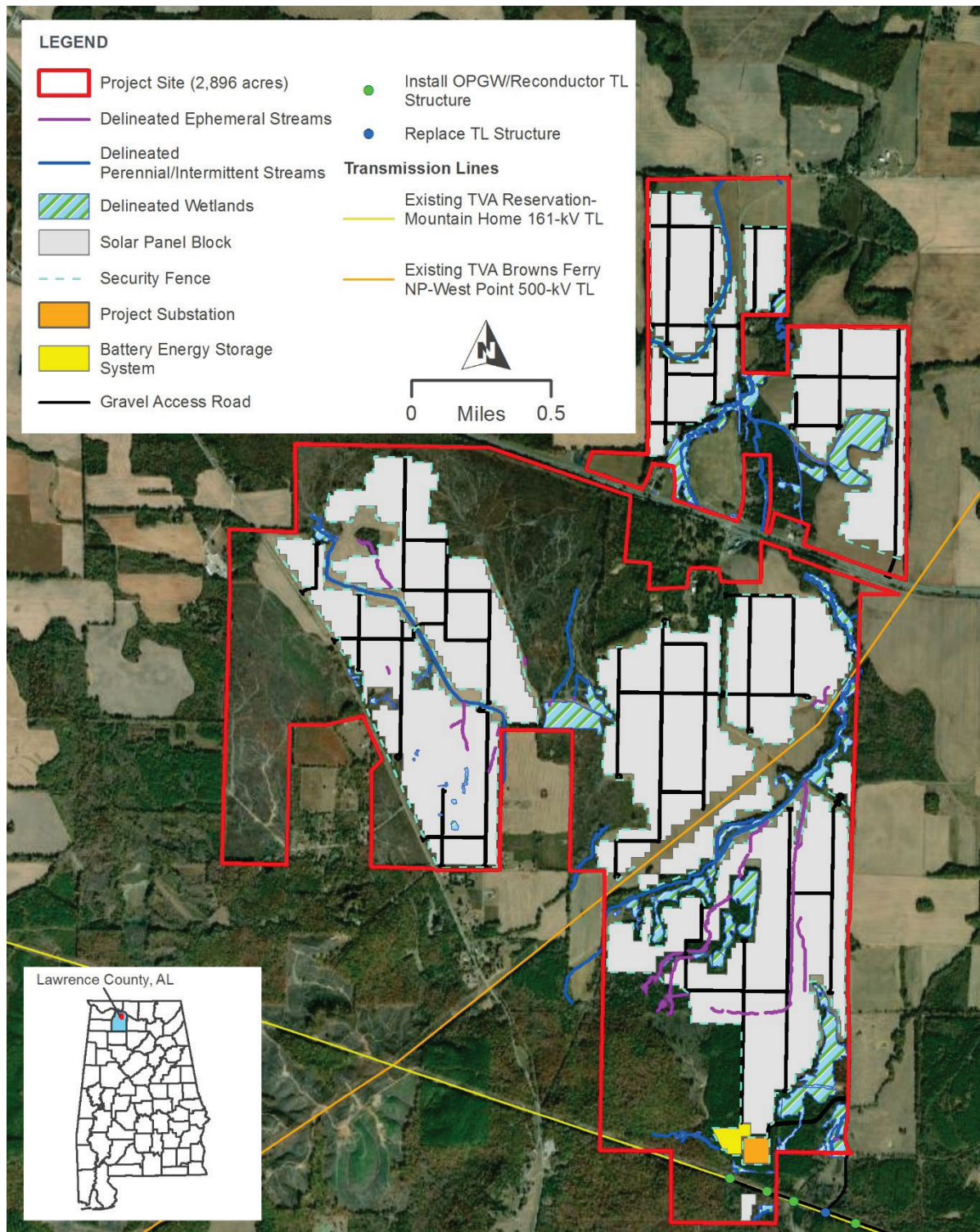
##### 3.4.2.2.2.1 Streams on the Project Site

The proposed solar PV facility has been designed to avoid increasing the loading of any pollutant/contaminant to a stream currently listed on the CWA Section 303(d) list as a result of any discharges to surface waters. Additionally, impervious surfaces prevent rain from percolating through the soil and result in additional runoff of water and pollutants into storm drains, ditches, and streams. Clearing of vegetation and groundcover and the addition of impervious surfaces could alter the current stormwater flows. The Proposed Action Alternative could increase the impervious cover on the Project Site by approximately eight acres, thus altering and possibly increasing the concentrated stormwater flow off the Project Site. This flow would be properly treated with either implementation of BMPs or by diverting the stormwater discharge to Project sedimentation basins during construction and proper design of the stormwater conveyances to ensure adequate drainage.

The 2020 Navigable Waters Protection Rule defined Waters of the U.S. for jurisdictional purposes during its effective period, which encompassed the timeframe when drainage features were identified on the Project Site. This rule removed ephemeral streams from USACE jurisdiction. However, the 2020 Navigable Waters Protection Rule was subsequently vacated, and jurisdictional Waters of the U.S. reverted to the pre-2015 definition for USACE-jurisdictional ephemeral streams. The pre-2015 jurisdictional definition

allows for USACE regulation of ephemeral streams that exhibit certain characteristics. The Project will obtain an approved jurisdictional determination from USACE to confirm the regulated ephemeral streams on site.

Overall, approximately 14,891 LF of the total 21,504 LF of ephemeral streams on the Project Site could be impacted by the installation of pilings to support the solar PV arrays and for the installation of culverts for road crossings (Figure 3-6). Depending on the jurisdictional determination by USACE, the length of impacted jurisdictional ephemeral streams could be less than 14,891 LF. As a standard practice, TVA would employ BMPs to protect streams during final site design, including keeping construction debris from entering, restricting wheel- or track-type equipment from crossing streams, and not broadcasting herbicides and fertilizers nearby (TVA 2017a). Ninety-six LF of two perennial or intermittent streams on the Project Site would be impacted by road crossings. These impacts would require an ADEM 401 permit and, if they are determined USACE-jurisdictional, a USACE 404 permit, as described in Section 1.4.2. Additionally, in accordance with TVA and ADEM requirements, 50-foot buffers surrounding perennial and intermittent streams in developed portions of the Project Site would be maintained as an avoidance measure.



**Figure 3-6. Proposed Project components in relation to Waters of the U.S. on the Project Site**

#### 3.4.2.2.2.2 Wetlands on the Project Site

Of the 125.44 acres of wetlands delineated on the Project Site, the proposed solar PV array and associated infrastructure would impact 0.07 acre due to the need for a road crossing through a pine plantation containing a wide wetland drain, in the extreme SE corner of the Project Site (Figure 3-6). The pine plantation wetland totals 7.44 acres and was assessed as moderate quality due to its size, disturbance regime, and hydrologic influence on downstream waters. The road would cross the wetland drain via a bridge or culvert, such that hydrologic flow would be maintained within the larger pine plantation wetland flat. The existing functions and values provided by the larger wetland habitat outside the 0.07-acre impact footprint are anticipated to be sustained post-construction. The 0.07 acre of wetland impact is subject to regulatory oversight of the USACE Nashville District and ADEM. The proposed impact would be covered by USACE's NWP program, which authorizes activities resulting in minimal adverse environmental effects. TVA would comply with all terms and conditions of the permit to further ensure no significant wetland impacts result from the road crossing. Conceptual and engineering design considered wetland presence and implemented avoidance strategies throughout the planning process. In compliance with the CWA and EO 11990, TVA has identified no practicable alternative to the Proposed Action Alternative, including the expected 0.07-acre wetland impact. If impacts to other wetlands determined by USACE to be jurisdictional are identified in course of finalizing design for the Project, these impacts would either fall under certain NWPs and be automatically authorized or be permitted as described in Section 1.4.2. If the overall impacts to jurisdictional wetlands and streams were to exceed 0.5 acre, an Individual Permit would be obtained to authorize impacts to Waters of the U.S.

Nearly all the wetlands on the Project Site would be avoided. In addition, a 50-foot buffer around each wetland would be maintained to provide an adequate upland vegetative buffer to further sustain adjacent wetland functions. Indirect impacts would be avoided through the implementation of an erosion control plan and measures, such as silt fencing, to prevent sedimentation in wetlands during construction. Likewise, a stormwater management plan would ensure hydrologic patterns on site are maintained in a manner that does not dry or flood the delineated wetland features.

#### 3.4.2.2.2.3 Transmission Line Upgrades

TL upgrade activities that would be necessary to interconnect the solar PV facility to TVA's existing electrical transmission network could result in stream and wetland impacts. Typically, fiber installation and reconductoring require vehicular access along the ROW to each TL structure in order to perform aerial work. Access across the 27 wetlands identified in the TL upgrade locations would be conducted in accordance with wetland BMPs to minimize soil compaction and ensure only temporary impacts result (TVA 2017a). This includes use of low-ground-pressure equipment, wetland mats, and dry season work scheduling. Permanent stream crossings that cannot be avoided would be designed to not impede runoff patterns and the natural movement of aquatic fauna. Temporary stream crossings and other construction and maintenance activities associated with the TL upgrades would comply with appropriate state permit requirements and TVA requirements as described in TVA's BMP manual (TVA 2017a). Construction and maintenance of the TL upgrades would employ manual and low-impact methods wherever possible. Proper implementation of these controls is expected to result in minor, temporary impacts to surface water.

Structure replacements associated with TL upgrades would result in wetland impacts. Based on preliminary plans, one of the four TL structures to be replaced is within a

palustrine emergent wetland (Wetland 22, Appendix A). Structure replacement within a wetland is considered fill and, therefore, a regulated activity. An estimated 0.0005 acre of fill would occur within the low-quality (TVARAM score of 10) wetland for replacement of the structure. TVA would adhere to all wetland mandates. Applicable CWA Section 404 and 401 permits would be obtained from USACE and ADEM for any stream and wetland alterations, the pole replacement impacts, and other impacts in the TL upgrade locations that cannot be avoided in order to maintain proper structure spacing along the existing TL, and application of the terms and conditions of these permits would minimize these impacts. The permits may also require compensatory mitigation. In addition, as with access across wetlands, structure replacement within wetlands would be conducted in accordance with TVA's BMPs (TVA 2017a), further ensuring that pre-existing contours are established and all impacts outside of the final structure footprint are temporary.

#### 3.4.2.2.4 Operations and Maintenance

Maintenance activities associated with operation of the solar PV facility would include, but would not be limited to, periodic inspections, repairs, herbicide and possibly other pesticide use, battery replacement, regular mowing, and potentially panel cleanings.

Heavy equipment would be inspected for leaks, and any underground wire installation and general heavy equipment activity would be conducted in a manner to minimize soil and vegetative cover disturbance. Vegetation on the Project Site would be actively maintained to control growth and prevent shading the PV panels. In addition to mowing, trimming and possibly animal grazing, pre-emergent and post-emergent herbicides may be selectively used. No herbicides would be used within 50 feet of a water body, and all requirements of the Federal Insecticide, Fungicide, and Rodenticide Act would be followed. Any herbicides used would be applied in accordance with applicable state and federal laws and regulations. Only herbicides registered with USEPA would be used. Herbicides would be applied per the USEPA-approved label and by a certified, licensed applicator.

During operations, the Project would not require potable water or a water treatment system. During operation, it would be expected that modules would be cleaned by precipitation. However, if modules would need to be manually cleaned, purified water, free of detergents and additives, would be trucked-in and would not produce a discharge.

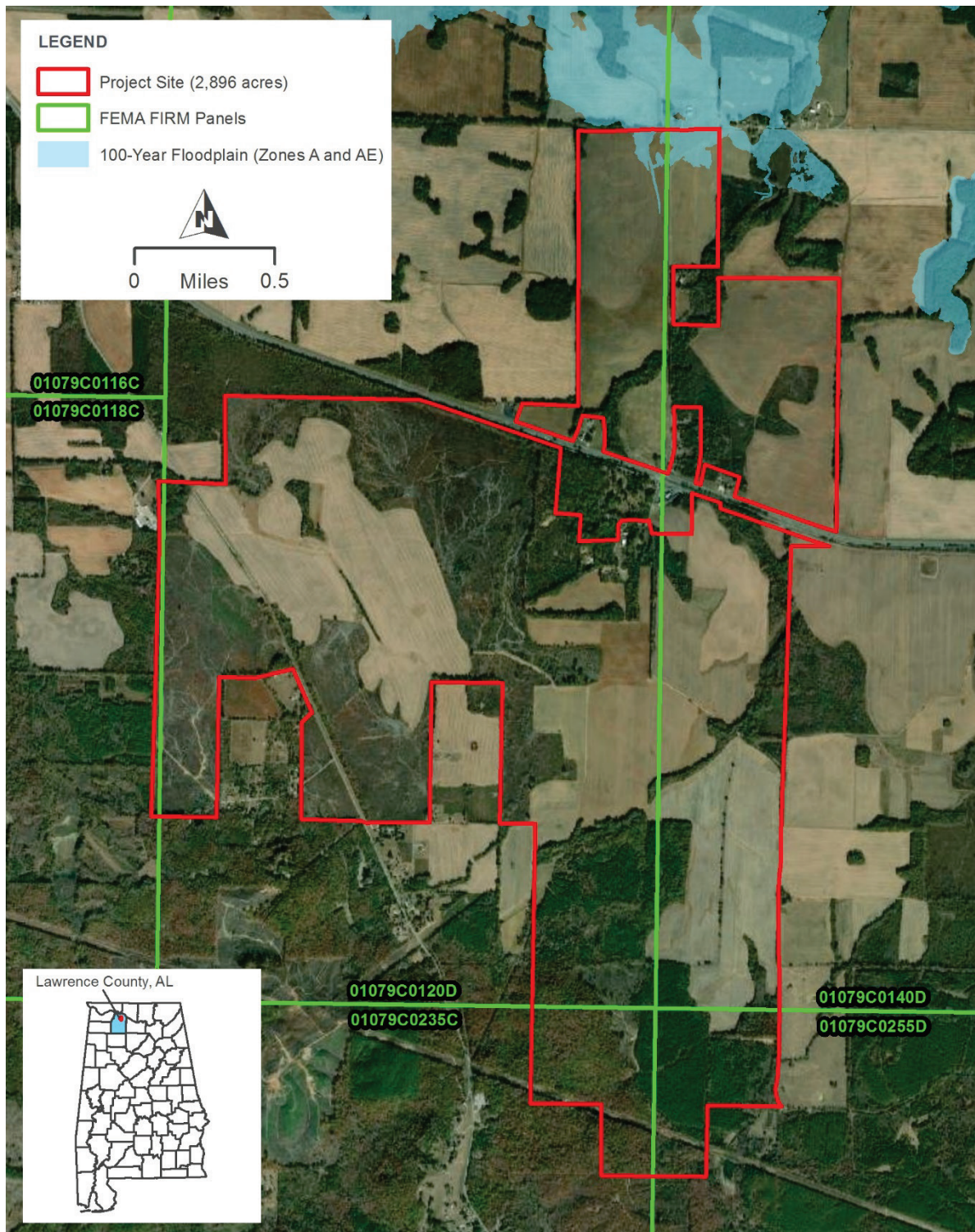
### 3.4.3 Floodplains

#### 3.4.3.1 *Affected Environment*

A floodplain is the relatively level land along a stream or river that is subject to periodic flooding. The land area subject to a one-percent chance of flooding in any given year is normally called the 100-year floodplain. The land area subject to a 0.2-percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in the floodplain to ensure that the Project is consistent with the requirements of EO 11988, Floodplain Management.

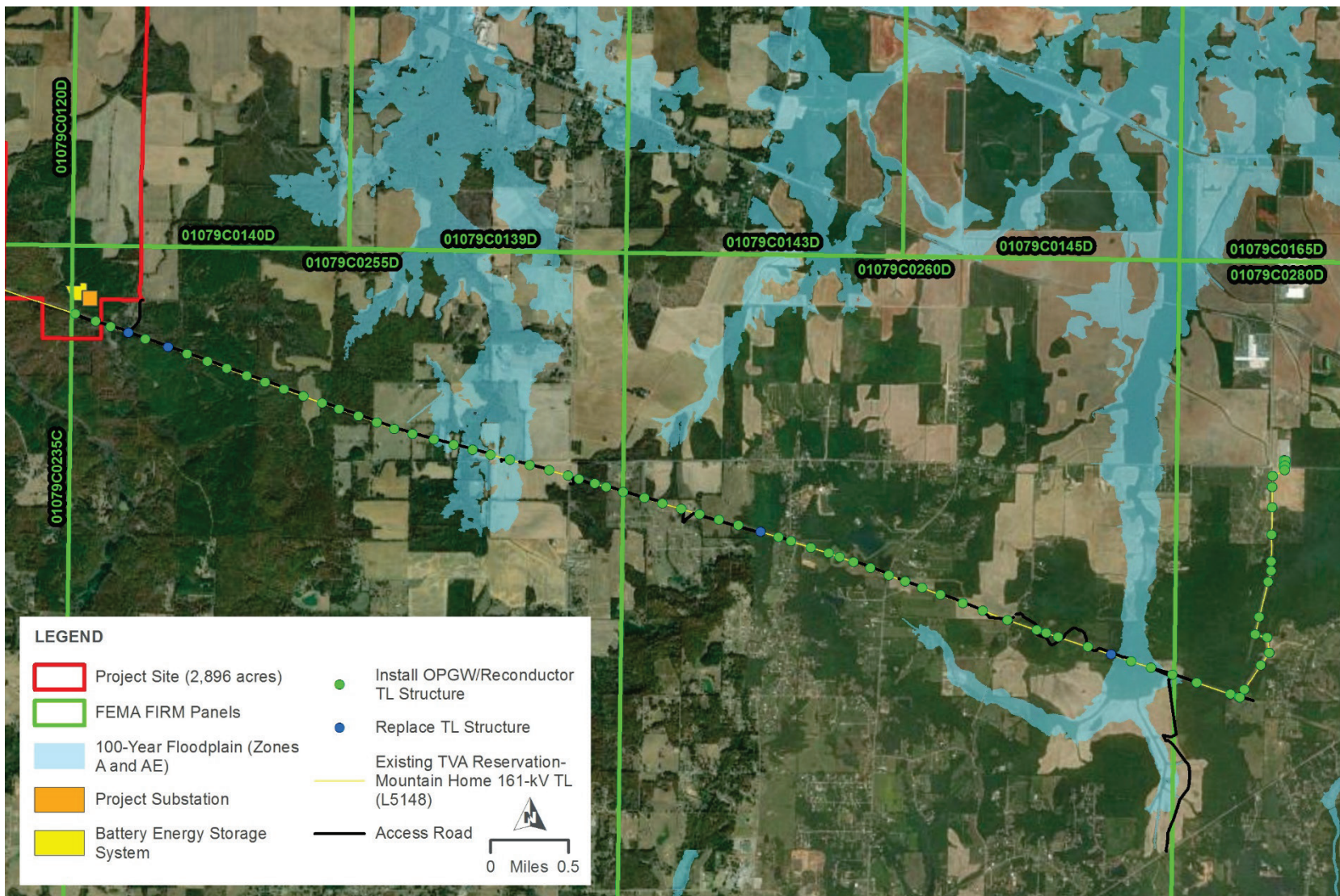
Based on Lawrence County Flood Insurance Rate Map panels, portions of the Project Site are located within the 100-year floodplain of Wheeler Branch (Figure 3-7). Portions of the existing TL and access roads to Structures 259-267, 269, 298-303, and 304-306 would occur within the 100-year floodplain of several additional streams in Lawrence County, as shown on Flood Insurance Rate Map panels 01079C0255D, 01079C0260D, and 01079C0280D (Figure 3-8).





**Figure 3-7. Floodplains in the Project Site vicinity**





**Figure 3-8. Floodplains in the TL upgrades vicinity**

### **3.4.3.2 Environmental Consequences**

This section describes the potential impacts to the floodplains should the Proposed Action or No Action Alternative be implemented.

#### **3.4.3.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to floodplains would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These actions would not affect floodplains. Actions associated with the potential future development and/or disposal of the site would be subject to applicable local floodplain regulations which would reduce adverse effects on floodplains.

#### **3.4.3.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "...to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (EO 11988, Floodplain Management). The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent governmental policy against such development under most circumstances (U.S. Water Resources Council 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

Project fences and access roads are the only components or activities associated with the Project Site with the potential to be located within 100-year floodplains. Consistent with EO 11988, installation of fences and access roads are considered to be repetitive actions in the 100-year floodplain that should result in minor impacts (TVA 1981). To minimize adverse impacts, any fence constructed within 100-year floodplains would be designed and constructed to withstand flooding with minimal damage, and any access roads constructed within 100-year floodplains would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot.

The structures to be replaced (Structures 249, 251, 283, and 302) are located outside 100-year floodplains, which would be consistent with EO 11988. The reconductoring work would occur on an existing TL and would be focused near the tops of the structures, well above the 100-year flood elevation. Portions of access roads to Structures 259-267, 269, and 302-306 are located within 100-year floodplains. Consistent with EO 11988, installation of utility lines, access roads, and culverts, are considered to be repetitive actions in the 100-year floodplain and would result in minor impacts (TVA 1981). When the facility is decommissioned and dismantled, to minimize adverse impacts, deconstruction and



demolition debris would be deposited outside the 100-year floodways when staged for removal.

The following measures to be employed by the Project within the 100-year floodplains would minimize adverse impacts to floodplains and their natural and beneficial values:

1. To the extent practicable, construction and maintenance would be scheduled during dry periods.
2. BMPs would be used during construction activities.
3. Construction in the floodplain would adhere to the TVA subclass review criteria for transmission line location in floodplains.
4. Fences constructed within 100-year floodplains would be designed and constructed to withstand flooding with minimal damage
5. Any road improvements done within 100-year floodplains would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot.
6. The TL ROW would be revegetated where natural vegetation would be removed.
7. When the facility is decommissioned and dismantled, deconstruction and demolition debris would be deposited outside the 100-year floodway.

With implementation of the above mitigation measures, the Proposed Action would have no significant impacts on floodplains and their natural and beneficial values.

### **3.5 Biological Resources**

This section describes the existing biological resources on the Project Site, in the project area, and in the TL upgrade locations, and the potential impacts to those resources that would be associated with the No Action and Proposed Action alternatives. Existing conditions for biological resources are presented for the vicinity of the Project Site and the TL upgrade locations, where Project effects to these resource areas could occur. The components of biological resources analyzed include vegetation, common wildlife, including migratory birds, aquatic life, and rare, threatened, and endangered species.

Habitat assessments were conducted by TVA biologists between January and August 2020. A bat habitat assessment was also conducted during these visits to assess and map potential for bat habitat on the Project Site. Rare, threatened, and endangered species with the potential to occur on the Project Site were inventoried using desktop review in August and October 2020, and the presence of suitable habitat on the Project Site was determined using field findings. TL upgrade locations were desktop reviewed in October 2020 and surveyed in the field in January 2022. Results of the desktop review and other background research and the various field investigations are described in this section.

The project area is located in the Interior Plateau Level III ecoregion, and the Project Site is more specifically within the Eastern Highland Rim Level IV ecoregion. As discussed in Section 3.3.1, calcareous geologies in the project area can result in karst features including springs, sinks, and caves (Griffith et al. 2001). The natural plant communities in this ecoregion are transitional between the oak-hickory forest that predominates to the west and the mixed mesophytic forest that predominates to the east. In the project area, the Eastern Highland Rim typically exhibits deep soils that support intensive row crop agriculture. These areas are heavily disturbed by past and present agricultural land uses.

### 3.5.1 Vegetation

#### 3.5.1.1 *Affected Environment*

Field surveys of the Project Site, conducted between April and August 2020, focused on documenting natural plant communities, invasive plants, and the presence of threatened and endangered plant species on portions of the Project Site that would be disturbed by the Project. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys consist of deciduous forest, evergreen forest, mixed evergreen-deciduous forest, and herbaceous vegetation. The plant communities observed on the Project Site are common and well represented throughout the region.

The structure and species composition of forest stands on the Project Site varies, but no forested areas on the Project Site had the structural characteristics indicative of old growth forest (Leverett 1996). Factors like soils, slope, and landscape help determine the type of forest present, but previous land use is an important factor determining the number and type of species a forest stand supports. The forest stands present on the Project Site are heavily disturbed by human activities and contain a large proportion of invasive species.

Deciduous forest, defined as forests with canopies composed of more than 75 percent deciduous trees, are common surrounding the agricultural fields on the Project Site. These stands have been harvested at regular intervals in the past, and many of these currently forested areas were likely maintained as row crop agricultural fields at some point in the past. Common overstory tree species in these stands include black locust, boxelder, cherry bark oak, honey locust, loblolly pine, Osage orange, red maple, sugarberry, sweetgum and willow oak, with green ash and sycamore on wetter sites. Depending on the time since an individual site was last cleared, the diameter of overstory trees ranges from less than 6 to over 24 inches diameter at breast height (DBH). The non-native shrub Chinese privet is a common component of these disturbed forests except on the wettest of sites. The herbaceous layer in these habitats contains relatively few species, but species like Carolina snail seed, Cherokee sedge, common blue violet, Japanese honeysuckle, longleaf woodoats, Philadelphia fleabane, poison ivy, roundleaf greenbrier, and Virginia creeper are common.

Mature, upland oak-hickory forest occupies less than 10 acres of the Project Site. These stands contain larger trees up to 24 inches DBH. Common trees include mockernut hickory, pignut hickory, shagbark hickory, southern red oak, white oak, and winged elm in the overstory. The herbaceous layer contains few species, but plants like American ipecac, licorice bedstraw, mayapple, spotted wintergreen, two flower melicgrass, and wild comfrey are present.

All other forest on the Project Site is either evergreen or mixed evergreen-deciduous. These stands are mostly homogenous and dominated by cultivated loblolly pine or have numerous loblolly pines in the overstory. Some of these stands have been planted in the last five to 10 years and contain trees less than 25 feet tall, while others have trees ranging from 12 to 18 inches DBH. These pine-dominated stands contain few other plant species. Other common tree species in these stands include black gum, sweetgum, and winged elm in the overstory and midstory and muscadine and Japanese honeysuckle in the herb layer.

Areas with more than 75 percent cover of forbs and grasses and less than 25 percent cover of other types of vegetation currently occupy much of the Project Site. These areas of herbaceous vegetation are generally used for intensive row crop agriculture. These fields

are rotated through crops like wheat, soybean, and corn and support few other plant species due to regular application of herbicide to control competing plants. Field edges have higher diversity and support early successional plants such as crabgrass, goosegrass, horseweed, ragweed, sericea lespedeza, sicklepod, and sumpweed; many of these species are non-native and indicative of low-quality habitats.

Over 100 acres of herbaceous vegetation with a higher proportion of native species occur along and adjacent to the Reservation–Mountain Home 161-kV TL, near the southern extent of the Project Site. An existing access road in the southern portion of the Project Site supports some native upland and wetland species including Appalachian ragwort, broomsedge, boneset, cattail, dog fennel, eastern gamagrass, false aster, helmet flower, multi-stemmed St. John's-wort, nodding bulrush, seedbox, soft rush, swamp sunflower, and tall goldenrod, but non-native plants including Brazilian vervain, Japanese honeysuckle, and sericea lespedeza are also common.

Portions of the TL ROW where TL upgrades would occur are dominated by herbaceous vegetation because woody species are routinely removed as part of TVA's standard vegetation management program. TVA ROW clearing routinely utilizes mowing and low-volume foliar application of herbicide to remove woody plants and promote reliability of the transmission system. Comprehensive field surveys of the TL upgrade locations conducted in January 2022 indicated that much of the area is highly disturbed and dominated by non-native plants. Typical examples of this type of vegetation include agricultural fields, mowed lawns, and weedy, early successional habitat that is similar to that found around field edges on the Project Site. Other portions of the TL upgrade locations contain higher-quality habitats dominated by native herbaceous plants. Common herbaceous plants in these areas include dense blazing star, giant plume grass, greasy grass, gray goldenrod, Indiangrass, and mountain mint, along with bushy bluestem, common rush, and various sedge species in wetter areas. One small area of the TL upgrade locations has limestone outcrops that support state-listed Michaux's gladeceess. This very small cedar glade encompasses less than one acre and is of lower overall quality than another cedar glade grassland that occurs farther to the east. The higher-quality site supports several threatened and endangered plant species, including Michaux's gladeceess and the federally endangered plant fleshy-fruit gladeceess.

Invasive plants, which are a major threat to native plant communities, have affected much of the project area. EO 13112, Invasive Species, directs TVA and other federal agencies to prevent the introduction of invasive species (both plants and animals), control their populations, restore invaded ecosystems and take other related actions. The more recent EO 13751, Invasive Species, amended EO 13112 and directs federal agencies to continue coordinated federal prevention and control efforts related to invasive species. This order incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into federal efforts to address invasive species and strengthens coordinated, cost-efficient federal action.

Within the Project Site and in the TL upgrade locations, invasive species occur in nearly all habitats. This high level of invasive species infestation indicates that much of the surveyed areas has been repeatedly and heavily disturbed by land uses such as intensive farming, grazing, timbering, and residential and commercial development. The invasive plant species observed within the surveyed areas are common and widespread throughout Alabama (Table 3-7).

**Table 3-7. Invasive plant species, as determined by the Alabama Invasive Plant Council, observed during field surveys of the Project Site and the TL upgrade locations**

Common Name	Scientific Name
Callery pear	<i>Pyrus calleryana</i>
Chinese lespedeza	<i>Lespedeza cuneata</i>
Chinese privet	<i>Ligustrum sinense</i>
Japanese stiltgrass	<i>Microstegium vimineum</i>
Johnsongrass	<i>Sorghum halepense</i>
Parrot feather watermilfoil	<i>Myriophyllum aquaticum</i>
Shrubby lespedeza	<i>Lespedeza bicolor</i>
Japanese honeysuckle	<i>Lonicera japonica</i>

Source: Alabama Invasive Plant Council 2012

### **3.5.1.2 Environmental Consequences**

This section describes the potential impacts to vegetation should the No Action or Proposed Action alternative be implemented.

#### **3.5.1.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to plant life would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These actions would result in little change to the vegetation on the site. The establishment of the species-rich native plant meadow, as described in Section 2.2, would have a beneficial effect on local plant diversity. The potential future development and/or disposal of the site could have an adverse effect on vegetation.

#### **3.5.1.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Converting forested land for the construction and operation of the Project would be long-term in duration (at least 20 years) and result in adverse but regionally insignificant impacts. Adoption of this alternative would require clearing of approximately 320 acres of forest. Less than 10 acres of this forest is mature with well-developed canopy and an understory populated with mostly native species. The remainder of the forest has been heavily degraded by current and previous land use and supports large populations of invasive plants. About 920 acres of forested land on the Project Site would not be cleared for the solar PV facility. As of 2019, there were over 1,500,000 acres of forested land in Lawrence and the surrounding Alabama counties (USFS 2020). Thus, Project-related effects to forest resources would be negligible when compared to the total amount of forested land occurring in the region.

All herbaceous plant communities found on the Project Site are heavily disturbed, early successional habitats. Following removal of these herbaceous plant communities, disturbed areas would be re-seeded to prevent erosion. While low growing vegetation would be planted under the PV arrays, construction of access roads and other Project infrastructure would result in some minor loss of herbaceous habitat for the life of the Project. This long-term loss of herbaceous vegetation would not be significant because these habitats are currently dominated by non-native species and have no appreciable conservation value.

Two areas along the Reservation–Mountain Home 161-kV TL ROW, near where TL upgrades would occur, support high-quality habitats dominated by native herbaceous plants. The highest quality of these habitats is dominated by a rich variety of native species and is of regional conservation significance. TVA has designed the TL upgrades to avoid this sensitive area, and no Project work would occur there. Short-term impacts to the lower-quality cedar glade habitat may occur during construction, but the impacts would not be significant because of the small size and disturbed condition of the area.

Many portions of the Project Site currently have a substantial component of invasive terrestrial plants, and adoption of the Proposed Action Alternative would not significantly affect the extent or abundance of these species at the county, regional, or state level. The use of TVA standard operating procedure of vegetating with noninvasive species (TVA 2017a) would serve to minimize the potential introduction and spread of invasive species on the Project Site.

As a mitigation effort and to promote environmental stewardship and pollinator habitat along with clean, renewable energy, TVA would also manage up to 150 acres of the Project Site as species-rich meadow. These restoration zones would be situated in areas that currently support croplands or in areas that were timbered in the past. Only previously timbered forested land would be cleared to establish the meadow areas, and the soil disturbance associated with this work would be minimal. In areas that are currently in agricultural production, restoration sites would be seeded with native grasses and wildflowers. Species would be selected to ensure that flowering plants are available to pollinators during as much of the growing season as possible. Sites would be maintained with a combination of annual winter mowing and periodic selective application of herbicide to woody species, and prescribed fire, where appropriately distance from solar arrays. Meadow establishment in recently timbered areas, where appropriately distant from solar arrays, would rely on prescribed fire to encourage native wildflowers and grasses. Much of this area is relatively dry and already has wildflower species adapted to open grasslands. Seeding and selective use of herbicide in these fire-managed areas would be used to increase species diversity and control non-native weeds, respectively.

### **3.5.2 Wildlife**

#### **3.5.2.1 Affected Environment**

The Project Site is predominantly croplands with fragmented patches of forest. Rural-residential properties are present in scattered locations surrounding the Project Site. Forest types range from cultivated loblolly pine to mixed-deciduous to deciduous. Several pine plantation areas also occur on the Project Site. Forested wetlands and streams occur on the property. A field survey of the TL upgrade locations was conducted in January 2022 and confirmed that the TL ROWs are composed of agricultural lands, both croplands and pasturelands, as well as abundant herbaceous plant areas amidst large forested areas. Bodies of water, such as wetlands and ponds, are also present. Overall, wildlife habitats

present on the Project Site and in the project area are common to the region and, as habitats, are not unique or uncommon.

Croplands comprise the vast majority of the Project Site. Actively cultivated fields provide habitat for a limited number of common wildlife species. Fields left fallow provide habitat for a wider range of species. Common inhabitants of croplands include killdeer, brown-headed cowbird, American kestrel, eastern bluebird, eastern kingbird, eastern meadowlark, field sparrow, grasshopper sparrow, and red-tailed hawk (National Geographic 2002). Bobcat, coyote, eastern cottontail, hispid cotton rat, and red fox are mammals typical of fields and cultivated land (Whitaker 1996). Amphibians such as eastern narrow-mouthed toad and reptiles including black racer, ring-necked snake, and eastern black kingsnake are also known to occur in this habitat type (Powell and Collins 2016; Bailey et al. 2006; Gibbons and Dorcas 2005).

Existing ROWs requiring TL upgrades are comprised of a variety of herbaceous habitats ranging from croplands to pasturelands and early successional habitats. Birds that utilize these areas include chipping sparrow, field sparrow, house finch, killdeer, grasshopper sparrow, mourning dove, red-tailed hawk, red-winged blackbird, wild turkey, and white-throated sparrow (National Geographic 2002). Mammals that can be found in these areas are common mole, coyote, least shrew, white-footed mouse, and white-tailed deer (Whitaker 1996). Reptiles that may use these habitats in this region include black racer, gray rat snake, corn snake, eastern black kingsnake, and scarlet kingsnake (Gibbons and Dorcas 2005). Emergent wetlands and saturated ephemeral streams within field settings provide habitat for common amphibians. Amphibians likely present include American bullfrog, American toad, southern leopard frog, spring peeper, as well as upland chorus frog (Powell and Collins 2016).

Developed and disturbed areas are home to a large number of common species, including American robin, American crow, Carolina chickadee, European starling, house finch, house sparrow, mourning dove, Carolina wren, northern cardinal, northern mockingbird, black vulture, and turkey vulture (National Geographic 2002). Mammals found in this community type include eastern gray squirrel, striped skunk, and raccoon (Whitaker 1996). Road-side ditches provide potential habitat for amphibians including American toad (toad tadpoles were observed in a ditch on the Project Site), and upland chorus frog. Reptiles potentially present include red-bellied snake, gray rat snake, and smooth earth snake (Powell and Collins 2016; Gibbons and Dorcas 2005).

Young regrowth in clear-cut pine plantation areas provide habitat for common birds, mammals, amphibians, and reptiles, as well as many insect pollinator species. Birds observed on the Project Site within these habitats consisted of black vulture, blue grosbeak, eastern bluebird, indigo bunting, northern mockingbird, and prairie warbler. Mammals that would use this area include bobcat, common raccoon, coyote, eastern chipmunk, eastern mole, groundhog, nine-banded armadillo, white-footed deer mouse, and white-tailed deer (Whitaker 1996). Corn snake, eastern kingsnake, and southern black racer are reptiles that may be found here (Gibbons and Dorcas 2005). A variety of species of bumblebee, common buckeye, common white-tailed dragonfly, hackberry emperor, pipevine swallowtail, and tiger swallowtail butterfly were observed in the timbered areas.

Forest fragments on the Project Site were often close to streams or wetlands. Birds observed in these forest fragments and on the edges include Acadian flycatcher, American goldfinch, American robin, barred owl, blue-gray gnatcatcher, blue jay, brown thrasher,

Carolina wren, common yellowthroat, eastern bluebird, eastern phoebe, eastern towhee, eastern wood pewee, gray catbird, northern cardinal, pine warbler, prairie warbler, red-bellied woodpecker, red-eyed vireo, red-shouldered hawk, ruby throated hummingbird, scarlet tanager, summer tanager, white-eyed vireo, and yellow-breasted chat. Mammals observed in this habitat include common raccoon and white-tailed deer. Reptiles observed were eastern box turtle and gray rat snake. Gray tree frogs were heard in several sections of riparian forest throughout the Project Site. Black-winged damselfly and ebony jewelwing damselfly were observed along forested streams. Forested areas alongside existing TL ROWs where upgrades would occur likely have a similarly structured wildlife community. Additional species observed in the vicinity of the TL upgrade locations included American crow, black vulture, Cooper's hawk, mourning dove, northern mockingbird, red-tailed hawk, tufted titmouse, and white-throated sparrow.

Several fire ant colonies were identified throughout the surveyed areas. The non-native, invasive fire ant impacts agriculture and natural resources by damaging crops, agricultural equipment, and preying on wildlife. USDA's Animal and Plant Health Inspection Service (APHIS) works to prevent the artificial (human) spread of this pest by enforcing the Federal Quarantine and works with state cooperators to regulate high risk commodities, such as nursery stock, hay, and soil-moving equipment. Lawrence County is currently under APHIS quarantine, as such, any soil, baled hay or straw, plants and sod with roots and soil attached, soil-moving equipment or other "Regulated Articles" as defined by USDA should be in compliance with APHIS Quarantine Regulations.

Review of the TVA Regional Natural Heritage Database (RNHD) in August and October 2020 indicated that two records of caves exist within three miles of the Project Site. The closest of these is approximately 1.9 miles away. An additional 24 caves exist within three miles of the TL upgrade locations. One of these caves occurs less than 137 feet from the edge of the TL ROW but none occur within the ROW itself. All of these are on private property.

No osprey nests or heronry records are known within three miles of the Project Site, and none were observed during field review in May 2020. Desktop review in November 2021 revealed two osprey nests occur within three miles of TL upgrade locations. The closest of these nests is approximately 2.7 miles away, and none were observed during field surveys in January 2022. Review of the USFWS Information for Planning and Consultation (IPaC) in November 2021 resulted in the identification of seven migratory bird species of conservation concern that have the potential to occur in the project area, consisting of blue-winged warbler, eastern whip-poor-will, Kentucky warbler, prairie warbler, red-headed woodpecker, rusty blackbird, and wood thrush.

During field surveys, the prairie warbler was observed in several locations on the Project Site, including forested edges adjacent to croplands along Wheeler Branch, forested edges between loblolly pine and deciduous forest, and the timbered areas that have been regenerating for a few years. Suitable habitat for this species also exists in the TL upgrade locations. Suitable habitat for blue-winged warbler, eastern whip-poor-will, Kentucky warbler, red-headed woodpecker, rusty blackbird, and wood thrush was observed on the Project Site. Suitable breeding habitat for blue-winged warbler and prairie warbler was observed in the TL upgrade locations.

### **3.5.2.2 Environmental Consequences**

This section describes the potential impacts to wildlife should the No Action or Proposed Action alternative be implemented.

#### **3.5.2.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to common wildlife would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. These actions would have little effect on area wildlife populations. Establishment of the TV proposed species-rich native plant meadow, as described in Section 2.2, would have a beneficial effect on wildlife occupying grassland habitats. The potential future development and/or disposal of the site could adversely affect area wildlife populations.

#### **3.5.2.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Facility construction and maintenance would alter wildlife habitats and affect the wildlife occurring in these habitats. Approximately 320 acres of forest would be cleared and additional areas of early successional habitat would be disturbed by construction activities. This would result in the displacement of any wildlife currently using the area, a large portion of which are relatively common and widespread. Direct effects to some individuals may occur if those individuals are immobile during the time of habitat removal. This could be the case if activities took place during breeding seasons or during winter if species burrow underground in areas of proposed ground disturbance. Habitat removal likely would disperse some mobile wildlife into surrounding areas in their attempt to locate new food sources, shelter sources, and to reestablish territories. Forest removal would occur in small fragments across the site as opposed to taking out large sections of contiguous forest. An estimated three acres of tree trimming, limbing, and/or clearing may also be required to improve access roads to reach TL structures that need upgrades. Similarly suitable habitat also exists in areas immediately adjacent to the Project Site and TL upgrade locations. Therefore, populations of common wildlife species likely would not be significantly impacted by the Proposed Action Alternative.

Migratory birds of conservation concern identified by USFWS would be impacted by the Project. Nesting and migratory habitat for prairie warbler, blue-winged warbler, eastern whip-poor-will, Kentucky warbler, and wood thrush would be eliminated on the Project Site. However, tree removal is proposed in winter when none of these species would be present in the region. Therefore, direct effects would be avoided. Rusty blackbirds may use the vegetated areas around small ponds and forested wetlands on the Project Site for foraging in winter. Red-headed woodpeckers can be found in the project area year-round nesting and roosting in tree cavities. Tree removal would occur when this species could be present in the project area; however, clearing activities would avoid the nesting season for this species. Should individuals of rusty blackbird or red-headed woodpecker occur on the Project Site or the TL upgrade locations at the time of tree removal or construction, they are



expected to flee if disturbed. No direct mortality is anticipated. A relatively large amount of forest would remain on the Project Site, and as with other wildlife species, suitable habitat also exists in areas immediately adjacent to the Project Site and the TL upgrade locations. Therefore, construction activities, particularly clearing and conversion of forested areas, including brushy, regenerating areas that were recently harvested, would result in localized adverse impacts to migratory birds of conservation concern, as well as other wildlife. These impacts would be insignificant at the larger regional level.

Bees, moths, butterflies, and many other insects are critical components of ecosystems and crop production due to their roles as pollinators. As discussed in Section 2.2, TVA proposes to establish and manage up to 150 acres to promote pollinator habitat on the Project Site. Croplands would be seeded with a wide variety of native grasses and wildflowers. Pollinators are often reliant on a specific host plant for their larval stage but then require an array of food plants nearby in order to survive and reproduce. Establishment of up to 150 acres of the Project Site with species-rich meadow would result in an increased abundance and diversity of pollinator species in the project area. This large-scale conservation effort would also help support nationwide efforts to increase pollinator habitat.

### **3.5.3 Aquatic Life**

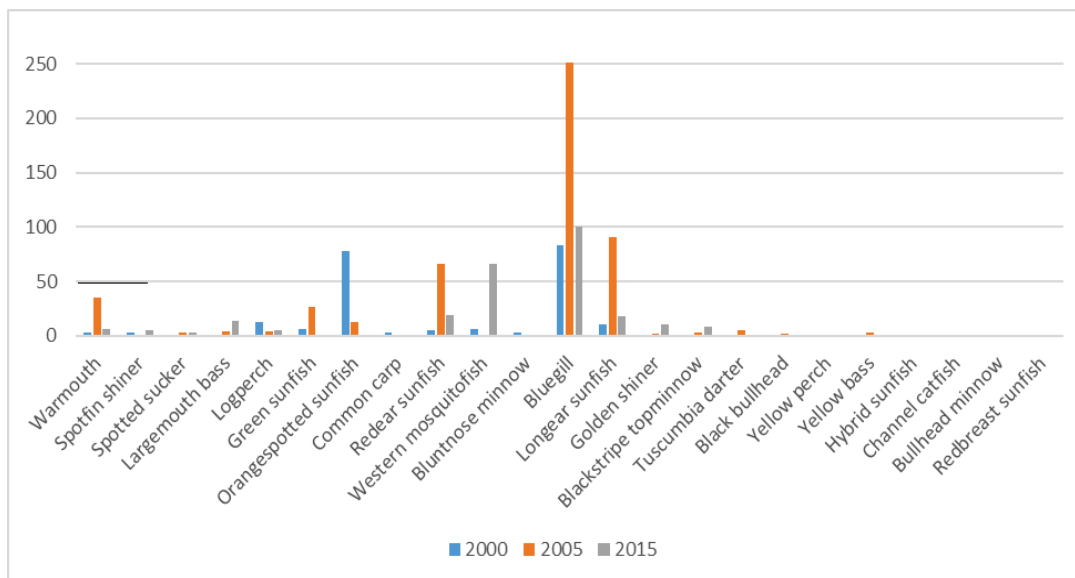
#### **3.5.3.1 Affected Environment**

##### **3.5.3.1.1 Aquatic Ecology**

The Project Site is situated across three HUC-10 sub-basins of the Tennessee Region HUC-6 watershed: Big Nance Creek (0603000501), Second Creek (0603000212), and Swan Creek (0603000201) (Figure 3-4; USGS 1987; USGS 2020e) and is within the Eastern Highland Rim Level IV ecoregion (USEPA 2017).

Field surveys were completed by biological compliance team members in January, March, and August 2020, and by Schoel Engineering in June 2020. Combined, a total of 10 perennial streams, 11 intermittent streams, 20 ephemeral streams, and six ponds were delineated on the Project Site (Appendix A). The streams encountered on the Project Site were typical of the Eastern Highland Rim Level IV ecoregion. Streams and other water bodies on the Project Site are described in more detail in Section 3.4.2.

Sampling was conducted in Wheeler Branch downstream of the Project Site in 2000, 2005, and 2015 by TVA biologists. The aquatic community within Wheeler Branch is typical of streams within the region. Bluegill was the most common species across the three sampling events followed by other sunfish species (Figure 3-9).



**Figure 3-9. Numbers of individuals of fish species collected in Wheeler Branch downstream of the Project Site**

A field survey of the TL upgrade locations was conducted in December 2021. A total of 10 perennial/intermittent streams, 12 ephemeral streams, and four ponds were delineated within the TL study area.

### 3.5.3.2 *Environmental Consequences*

This section describes the potential impacts to the aquatic environment use should the Proposed Action or No Action Alternative be implemented.

#### 3.5.3.2.1 **No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to aquatic life would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would have little effect on aquatic life. The thinning of the dense vegetative buffer along Wheeler Branch, as described in Section 2.5. may increase the diversity of fish and other aquatic species in the affected portion of the stream. The potential future development and/or disposal of the site could adversely affect aquatic life, although these effects would be reduced by adherence to applicable regulations.

#### 3.5.3.2.2 **Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period. This may result in direct or indirect impacts to aquatic species present on the Project Site and in the TL upgrade locations.

Potential impacts to aquatic species from the Project may result from herbicide runoff into streams. Indirect impacts to aquatic species may also occur due to minor increases in erosion and sedimentation during construction and operations. Siltation has a detrimental effect on many aquatic animals adapted to riverine environments. Turbidity caused by suspended sediment can negatively impact spawning and feeding success of fish and mussel species (Brim Box and Mossa 1999). Streamside management zones, or vegetative buffers, would be left intact on the Project Site. Thus, the changes would occur due to minor increases in erosion and sedimentation during construction and operations. These Project effects would be temporary and minimized by adherence to soil management BMPs.

Ephemeral streams documented on the Project Site only flow in response to precipitation events and do not support aquatic biology. Ground disturbances surrounding ephemeral streams, in the form of PV array pilings that are small in diameter, would be relatively minimal, and BMPs would be implemented to prevent or reduce surface water runoff from carrying suspended solids into adjacent waterbodies (TVA 2017a).

Streams present near the TL structures or intersected by access roads associated with the TL upgrades have the potential to be impacted from surface water runoff increasing siltation to those receiving waters. Ground disturbance would be minimized, and all work would be conducted in accordance with BMPs outlined in TVA's BMP manual (TVA 2017a). Therefore, impacts to the aquatic ecology of streams in association with the TL upgrades would be minor and insignificant. Furthermore, applicable CWA Section 404 and 401 permits would be obtained from USACE and ADEM for any stream alterations located in the TL upgrade locations, and application of the terms and conditions of these permits would minimize these impacts. The permits may also require compensatory mitigation.

### **3.5.4 Threatened and Endangered Species**

Rare, threatened, and endangered species are regulated by both the federal and state governments. Lists from TVA's RNHD and USFWS's IPaC of federally and state-listed species potentially occurring in the project area were obtained in August 2020 for the Project Site and in October 2020 for the TL upgrade locations (USFWS 2020a). The RNHD identified species potentially occurring in Lawrence County and/or within resources-defined distances from the Project Site or TL upgrade locations or generally listed for the county. These lists were obtained to identify the rare, threatened, and endangered animal and plant species potentially occurring in the project area, and to focus field survey efforts on habitats potentially occupied by these species.

#### **3.5.4.1 Affected Environment**

Reviews of the RNHD and IPaC indicated 15 federally listed or protected species and 18 additional species of conservation concern with state ranks or statuses with the potential to occur in the Project Site vicinity or in the TL upgrade locations. The species consist of four federally listed terrestrial animals, one federally protected terrestrial animal, one candidate terrestrial animal, two federally listed aquatic species, three state-listed terrestrial animals, eight federally listed plant species, seven state-listed aquatic species, and seven state-listed plants (Table 3-8). Designated critical habitat for the federally listed fleshy-fruit gladece is present on a portion of Reservation–Mountain Home 161-kV TL, near where TL upgrades are planned; no critical habitat is present on the Project Site or the immediate TL upgrade locations. Each federally and state-listed species is discussed in this section in relation to potential habitat on the Project Site.

**Table 3-8. Federally and state-listed or protected species potentially occurring in the project area**

Common Name	Scientific Name	Federal Status	State Status	State Rank	Potential Habitat on Project Site/TL Upgrade Locations
<b>Bird</b>					
Bald eagle <sup>1</sup>	<i>Haliaeetus leucocephalus</i>	DM	SP	S4B	No
Osprey	<i>Pandion haliaetus</i>	-	SP	S4	Yes
Red-cockaded woodpecker <sup>1</sup>	<i>Picoides borealis</i>	LE	SP	S2	No
<b>Fish</b>					
Tuscumbia darter	<i>Etheostoma tuscumbia</i>	-	SP	S2	Yes
Southern cavefish	<i>Typhlichthys subterraneus</i>	-	SP	S3	No
<b>Arthropod</b>					
A beetle	<i>Batrachosymodes spelaeus</i>	-	-	S3	No
Monarch butterfly	<i>Danaus plexippus</i>	C	-	S5	Yes
<b>Mammal</b>					
Gray bat <sup>1</sup>	<i>Myotis grisescens</i>	LE	SP	S2	Yes
Indiana bat <sup>1</sup>	<i>Myotis sodalis</i>	LE	SP	S2	Yes
Northern long-eared bat <sup>1</sup>	<i>Myotis septentrionalis</i>	LT	SP	S2	Yes
Tricolored bat	<i>Perimyotis subflavus</i>	-	-	S3	Yes
<b>Mollusk</b>					
Lilliput	<i>Toxolasma parvum</i>	-	PSM	S3	No
Pink mucket	<i>Lampsilis abrupta</i>	LE	SP	S1	No
Rough pigtoe	<i>Pleurobema plenum</i>	LE	SP	S1	No
Purple lilliput	<i>Toxolasma lividus</i>	-	PSM	S2	No
Round-rib elimia	<i>Elimia nassula</i>	-	-	S1	Yes
Tennessee pigtoe	<i>Pleurobema barnesiana</i>	-	PSM	S1	No
White heelsplitter	<i>Lasmigona complanata</i>	-	PSM	S2	No

Common Name	Scientific Name	Federal Status	State Status	State Rank	Potential Habitat on Project Site/TL Upgrade Locations
<b>Plant</b>					
Price's potato-bean <sup>1</sup>	<i>Apios priceana</i>	LT	SLNS	S2	No
American hart's-tongue fern	<i>Asplenium scolopendrium</i> var. <i>americanum</i>	LT	SLNS	S1	No
Leafy prairie-clover <sup>1</sup>	<i>Dalea foliosa</i>	LE	SLNS	S1	No
Harper's umbrella-plant	<i>Eriogonum harperi</i>	-	SLNS	S1	Yes
Butler's quillwort	<i>Isoetes butleri</i>	-	SLNS	S2	Yes
Alabama gladeceess	<i>Leavenworthia alabamica</i>	-	SLNS	S2	Yes
Fleshy-fruit gladeceess	<i>Leavenworthia crassa</i>	LE	SLNS	S2	Yes
Michaux's gladeceess	<i>Leavenworthia uniflora</i>	-	SLNS	S2	Yes
Lyrate bladderpod <sup>1</sup>	<i>Lesquerella lyrata</i>	LT	SLNS	S1	No
Duck river bladderpod	<i>Paysonia densipila</i>	-	SLNS	S1	Yes
White fringeless orchid <sup>1</sup>	<i>Platanthera integrilabia</i>	LT	SLNS	S2	No
Kral's water-plantain <sup>1</sup>	<i>Sagittaria secundifolia</i>	LT	SLNS	S1	No
Sunnybell	<i>Schoenolirion croceum</i>	-	SLNS	S2	No
Prairie-dock	<i>Silphium pinnatifidum</i>	-	SLNS	S2	No
Alabama streak-sorus fern <sup>1</sup>	<i>Thelypteris pilosa</i> var. <i>alabamensis</i>	LT	SLNS	S1	No

Source: TVA 2020d

<sup>1</sup> Species reported for county and not the immediate project area.

Federal status codes: DM = Delisted, recovered, and still being monitored; LE = Listed Endangered; LT = Listed Threatened; PS = Partial Status

State status codes: PSM = Partial Status Mussels; SLNS = Listed but no status assigned; S1= Critically imperiled; S2= Imperiled; S3-Vulnerable; S4 = Apparently Secure; S#B = Rank of breeding population; SP= State Protected

State ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2)

### **3.5.4.1.1 Federally Listed Species**

#### **3.5.4.1.1.1 Terrestrial Animals**

Review of the RNHD and IPaC indicated that there are no federally listed terrestrial animal species recorded within three miles of the Project Site or the TL upgrade locations. A candidate for federal listing, the monarch butterfly also occurs in Lawrence County. Four federally listed terrestrial animal species (gray bat, Indiana bat, northern long-eared bat, and red-cockaded woodpecker) and one federally protected terrestrial animal species (bald eagle) have been reported in Lawrence County (Table 3-8).

Monarch butterflies are a highly migratory species, with eastern U.S. populations overwintering in Mexico. Summer breeding habitat in the U.S. requires milkweed plant species, on which adults exclusively lay eggs for larvae to develop and feed on. Adults will drink nectar from other blooming wildflowers when milkweeds are not in bloom. Suitable habitat for monarchs, both during migration and the breeding season, occurs on and in the vicinity of the Project Site.

Bald eagles are protected under the Bald and Golden Eagle Protection Act. This species is associated with larger mature trees capable of supporting its massive nests. These are usually found near larger waterways where the eagles forage (USFWS 2007). Five bald eagle nests are known from Lawrence County. The closest known nest is approximately nine miles from the action area. While suitable nesting trees occur throughout the Project Site, there is no large water body close enough for this to be considered a likely nesting site. No bald eagle nests were documented on the Project Site during field reviews in May 2020.

Red-cockaded woodpeckers typically inhabit open, mature, pine forests with dense groundcover consisting of a variety of grass, forb, and shrub species (Turcotte and Watts 1999; USFWS 2003). These woodpeckers are extirpated from much of their historic range, and the two records that exist from Lawrence County are historic and over 19 miles away. No populations of this species occur in the project area, and no suitable pine forest habitat occurs on or in the immediate vicinity of the Project Site or the TL upgrade locations.

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (Brady et al. 1982; Tuttle 1976a). Bats disperse over bodies of water at dusk where they forage for insects emerging from the surface of the water (Tuttle 1976b). Only one gray bat hibernaculum has been documented in Lawrence County, in the Bankhead National Forest. This is the closest known hibernaculum and is approximately 16 miles away. Historic records exist from a cave in Lauderdale County, within 10 miles of the Project vicinity. This cave has been inundated by reservoir impoundment. No caves or other gray bat roosting habitat are known on the Project Site.

Indiana bats hibernate in caves in winter and use areas around them for swarming (mating) in the fall and staging in the spring, prior to migration back to summer habitat. During the summer, Indiana bats roost under the exfoliating bark of dead snags and living trees in mature forests with an open understory and a nearby source of water (Pruitt and TeWinkel 2007; Kurta et al. 2002). Indiana bats change roost trees frequently throughout the season, while still maintaining site fidelity by returning to the same summer roosting areas in subsequent years (Pruitt and TeWinkel 2007). The closest extant records of this species are from hibernacula approximately 16 miles away in the Bankhead National Forest. Historic records exist from a cave, now inundated, in Lauderdale County, Alabama, within 10 miles of the action area.

The northern long-eared bat predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring, they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees (typically greater than three inches DBH). Roost selection by northern long-eared bat is similar to that of Indiana bat; however, northern long-eared bats are thought to be more opportunistic in roost site selection. This species also roosts in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (USFWS 2014a). The closest extant records of this species are from hibernacula approximately 16 miles away in the Bankhead National Forest.

No known caves or suitable winter roosting structures for Indiana bat or northern long-eared bat exist on the Project Site or in the TL upgrade locations. Twenty-four caves are known within three miles of the TL upgrade locations. The nearest of these is approximately 137 feet from the edge of the TL ROW. No bats were observed in this cave. Bats, including an unidentified individual, were documented in another cave approximately 0.2 mile from the TL ROW during a January 2022 field survey. Therefore, it is assumed that federally listed bats may occur in the cave.

Foraging habitat and sources of drinking water exist in streams, ponds, and wetlands on the Project Site and in the TL upgrade locations. Field surveys of the Project Site in May 2020 and in TL upgrade locations in January 2022 followed the *Range-Wide Indiana Bat Survey Guidelines* identified 338.3 acres of summer roosting habitat occurring on the Project Site in mature live hardwoods (including white oaks and shagbark hickories) and snags (USFWS 2020b). Limb trimming may be required along access roads associated with the TL upgrades, but no suitable roost trees are present. Suitable foraging habitat for Indiana bat and northern long-eared bat occurs throughout the forested areas on the Project Site, as well as over streams, ponds, and wetlands on the Project Site and in the TL upgrade locations.

#### 3.5.4.1.1.2 Aquatic Species

The pink mucket and rough pigtoe are known from the main stem Tennessee River, more than five miles north of the Project Site. These species are not known to inhabit small, spring fed streams, and no suitable habitat for these species was observed during the March 2020 field surveys.

#### 3.5.4.1.1.3 Plants

Seven federally listed plant species that occur in a variety of habitats have been documented for Lawrence County. One of these, the fleshy-fruit gladeceess has previously been identified in the TL upgrade locations, with designated critical habitat nearby. This section provides a description of the habitat preferences associated with each species.

In Alabama, American hart's-tongue tongue fern is restricted to sheltered areas around cave openings with high humidity and moderate summer temperatures. This highly specialized habitat preference restricts the species to only a handful of locations in the Southeast.

Price's potato-bean is a twining vine that prefers open, mixed-hardwood stands, along forest edges, and clearings on river bottoms and ravines (USFWS 1993). Price's potato-

bean can also be found on sunny roadsides where it proliferates or as stunted individuals in deeper shade. The species is often found in mesic areas (i.e., moderate amount of moisture) on calcareous substrates (i.e., containing lime or being chalky) in open, low areas near streams or along the banks of streams and rivers. It is also found near the base of small limestone bluffs and often grows in well-drained loams or old alluvium over limestone on rocky, sloping terrains.

Leafy prairie-clover is a legume native to Alabama, Illinois, and Tennessee. Within the TVA power service area, leafy prairie-clover occurs in thin-soiled limestone glades and limestone barrens in the Inner Nashville Basin of Tennessee and geologically similar areas of the Eastern Highland Rim in northern Alabama (NatureServe 2020). In glade habitats, leafy prairie-clover is usually associated with seasonally wet seepage areas or stream channels. In barrens habitat with deeper soils, leafy prairie-clover can inhabit drier situations.

Fleshy-fruit gladeceess is an annual member of the mustard family that flowers in the early spring. This species is native to a very small area of the Eastern Highland Rim of north central Alabama and is found sporadically throughout an area about 80 square miles in size (USFWS 2014b). The species primarily inhabits shallow soils around limestone cedar glades but can also occur in other open habitats with disturbed soils like pastures and roadsides.

Lyre-leaf bladderpod has a range and life history strategy similar to fleshy-fruit gladeceess. The species is a winter annual that only occurs in association with limestone cedar glades in a small part of northern Alabama. While it primarily inhabits shallow soils around limestone cedar glades, it can also occur in other open habitats with disturbed soils like pastures and roadsides. Extant populations are known to occur at three separate locations in Colbert, Franklin, and Lawrence County, Alabama.

White fringeless orchid occurs in small headwater wetlands on soils with low fertility and organic matter in both closed canopy forest and open situations (USFWS 2015; Shea 1992). As of 2014, white fringeless orchid occurred at 58 sites in Alabama, Georgia, Kentucky, Mississippi, South Carolina, and Tennessee. In addition, 22 sites of uncertain status occur throughout the range of the species (USFWS 2015).

Kral's water-plantain principally occupies free-flowing riverine environments with steep banks on either side of the river. This aquatic plant roots in the crevices between bedrock and larger gravels. The global range is restricted to a few watersheds within central and northern Alabama.

Alabama streak-sorus fern grows in crevices of sandstone cliffs. Most populations are found along shaded bluffs and outcrops along the Sipsey Fork and its principal tributaries.

All habitats within the Project Site were field surveyed, and no federally listed species were observed. Several of the federally listed species reported from Lawrence County occur only in association with limestone cedar glades. No examples of these grasslands with shallow soils and prominent rock outcrops occur on the Project Site.

In spring of 2020, thousands of individual fleshy-fruit gladeceess plants were observed across a several thousand square foot portion of high-quality limestone cedar glade adjacent to sections of the Reservation–Mountain Home 161-kV TL ROW that are proposed to be upgraded.



### 3.5.4.1.2 State-Listed Species

#### 3.5.4.1.2.1 Terrestrial Animals

The RNHD and IPaC indicated that there are no state-listed terrestrial animal species that are not also federally listed recorded within three miles of the Project Site. Review of the TL upgrade locations identified three state-listed species within three miles (Table 3-8).

Osprey occupy riparian habitats alongside bodies of water such as rivers, lakes and reservoirs. They build nests of sticks on a variety of man-made structures (e.g., transmission line structures, lighting towers) near water (NatureServe 2020). Two osprey nests occur on structures in an unrelated TL ROW approximately 2.7 miles away. No nests were observed during field reviews of the Project Site and TL upgrade locations.

The beetle *Batrasympodes spelaeus* is a cave obligate tracked by the state of Alabama (NatureServe 2020). This beetle occurs in the cave that is approximately 137 feet from the TL upgrade locations. Seven of the 31 other caves within three miles of the Project Site have records of *Batrasympodes spelaeus*.

Tricolored bats hibernate in caves, mines, and rock crevices. Maternity and other summer roosts are mainly in dead or live vegetation in live trees. They are associated with forested landscapes where they forage near trees and along waterways, especially riparian areas (Harvey et al. 2011). Summer roost trees selected in the Great Smoky Mountains National Park are often oak and yellow poplar (Carpenter 2017). In Middle Tennessee, tricolored bats were observed roosting within clumps of dead foliage hanging from branches of live trees. The dead foliage was typically comprised of hickory or oak leaves (Thames 2020). In January 2022, this species was observed hibernating in a cave approximately 0.2 mile from the TL upgrade locations and approximately 0.4 mile from the nearest structure to be replaced.

#### 3.5.4.1.2.2 Aquatic Species

Like the federally listed pink mucket and rough pigtoe, the state-listed lilliput, purple lilliput, Tennessee pigtoe, and white heelsplitter are known from the main stem Tennessee River, more than five miles north of the Project Site. These species are not known to inhabit small, spring fed streams, as on the Project Site, and no suitable habitat for these species was observed during the March 2020 field surveys.

Though the southern cavefish has been observed at the outlets of underground springs (Burr and Warren 1986; Pflieger 1997; Boschung and Mayden 2004), they represent atypical habitats into which fish have been flushed, washed, carried, or transported (Noltie and Wicks 2001). Southern cavefish appear not to be long-term inhabitants of the spaces that are humanly accessible (Noltie and Wicks 2001) and, instead, prefer to inhabit cool (50-57 degrees Fahrenheit (°F), clear waters of cave streams, which are absent from the Project Site.

While not state- or federally listed, the round-rib elimia is a globally rare species with an extremely restricted distribution. This species is endemic to north-central and northwestern Alabama, where it is found in springs and spring branches (Burch 1989). More recent field work documented its occurrence in four springs and/or spring branches in four counties, including Wheeler Branch in Lawrence County, as well as its likely extirpation from a fifth site (Mirarchi et al. 2004). The round-rib elimia was abundant during the March 2020 field survey of the Project Site, where it inhabited aquatic vegetation, sandy silt substrate, and cobble boulders. It was found in Wheeler Branch upstream and downstream of the CR 377

stream crossing, as well as the portion of Wheeler Branch directly north (downstream) of US 72A. None were observed in the roughly quarter-mile middle reach of Wheeler Branch which has a dense, intact canopy surrounding the stream that may inhibit the growth of aquatic vegetation. Aquatic vegetation appears to be an important component of round-rib elimia habitat.

The Tuscumbia darter is a state-listed fish that has been petitioned for federal listing due to present or threatened destruction, modification, or curtailment of its habitat or range; inadequacy of existing regulatory mechanisms; and other natural or manmade factors, according to USFWS. Habitat for the Tuscumbia darter is restricted to vegetated spring pools and runs with slow current and is usually associated with aquatic plants or algae over clean substrates of fine gravel, sand, and silt. This species resides in high-quality habitats in water that is generally clear, clean, and cool (50-57°F) (Etnier and Starnes 1993; Boschung and Mayden 2004; Page and Burr 2011). The range of this species is limited to springs along the southern bend of the Tennessee River in northern Alabama (Boschung and Mayden 2004) and (formerly) south-central Tennessee (Etnier and Starnes 1993). The fish has been extirpated from roughly half of known sites in Alabama. Existing populations are vulnerable to human alteration of spring heads.

Targeted surveys for the Tuscumbia darter were conducted in Wheeler Branch in March 2020. A total of 14 individuals was captured, measured, and released. Beginning with the pond spring at the General Joe Wheeler Home and moving downstream, there is a profusion of aquatic vegetation that transitions to less aquatic vegetation. This may directly correlate with available habitat for the Tuscumbia darter, as nine individuals were found at three opportunistically selected sites in one hour at upstream locations, whereas only five individuals were found in three hours of sampling farther downstream, upstream and downstream of the CR 377 bridge.

None of the individuals were found directly underneath aquatic vegetation at the downstream site, whereas almost all of the individuals found at the upstream sites were found directly underneath floating vegetation, perhaps indicating higher quality habitat. The dense, intact stream buffer along the middle reach of Wheeler Branch within the Project boundary likely inhibits the growth of aquatic vegetation that is necessary for the Tuscumbia darter to persist. No individuals were observed in the roughly quarter-mile stretch of Wheeler Branch where the dense stream buffer is intact.

#### 3.5.4.1.2.3 Plants

Review of the RNHD indicated that seven Alabama state-listed plant species have been previously reported within a five-mile vicinity of the project area (Table 3-8). All habitats on the Project Site were surveyed, and no state-listed species were observed. Like several of the federally listed plants, all state-listed plants reported from near the project area occur in association with limestone cedar glades. No examples of these habitats occur on the Project Site.

One area along the Reservation–Mountain Home 161-kV TL supports a high-quality habitat dominated by native herbaceous plants. In addition to the federally endangered fleshy-fruit gladeceess, discussed in in the federally listed species section, TVA botanists documented five plants tracked by the State of Alabama in this area. Rare species at this site include the globally rare species Harper’s umbrella plant, Duck River bladderpod, and Michaux’s gladeceess (Table 3-8). Another population of Michaux’s gladeceess, was observed during the January 2022 surveys of the TL upgrade locations on a smaller cedar glade west of the

higher quality grassland. Between 50 and 100 Michaux's gladecress plants were observed growing within the TL ROW on limestone outcrops with thin soil. This glade is very small and somewhat degraded and disturbed.

### **3.5.4.1.3 Environmental Consequences**

This section describes the potential impacts to federally and state-listed threatened and endangered species should the Proposed Action or No Action Alternative be implemented.

#### **3.5.4.1.3.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to rare, threatened, or endangered species would be expected to occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would not affect listed species. The potential thinning of the dense vegetative buffer along Wheeler Branch, as described in Section 2.5, would have beneficial effects to rare and state-listed aquatic species. TVA's interim activities on the site would follow TVA's standard BMPs and permitting requirements to minimize the potential for adverse impacts to rare, threatened, or endangered species. Activities associated with the potential future development and/or disposal of the site could have adverse effects. TVA would continue to manage its TL ROWs on and in the vicinity of the site as outlined in TVA's *Transmission System Vegetation Management Draft Programmatic EIS* (TVA 2019b), and impacts to rare, threatened, and endangered species would be avoided, minimized, or mitigated.

#### **3.5.4.1.3.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

##### **3.5.4.1.3.2.1 Terrestrial Animals**

Five listed terrestrial animal species have the potential to utilize the project area. No bald eagle nests would be impacted by the Project, and the closest known nest is over eight miles away. Therefore, Project actions are in compliance with the National Bald Eagle Management Guidelines. No suitable habitat for the red-cockaded woodpecker is present, and it has likely been extirpated from the area. Bald eagles and red-cockaded woodpeckers would not be impacted by the Proposed Action Alternative.

No osprey nests are known within 660 feet of the Project Site or TL upgrade locations, and none were observed during field surveys. Impacts to osprey are not anticipated from the Proposed Action.

The majority of the Project Site is currently in agricultural production, which does not provide suitable habitat for monarch butterflies. Approximately 320 acres of forest would be cleared and a portion of this will be maintained as early successional habitat. This area will be revegetated with native and/or noninvasive vegetation to restore habitat. The revegetation would include a 150-acre species-rich meadow that would promote pollinators in the Project Site. Impacts to immobile individuals and eggs, larvae, and pupae could occur

during construction, but the benefit of restoring habitat would outweigh the temporary adverse impacts to individuals.

The cave-dwelling beetle *Batrasyommodes spelaeus* occurs in a cave close to the ROW of a TL to be upgraded. TVA will implement conservation measures to ensure that any drilling or blasting would not impact the integrity of nearby caves. In addition, BMPs would be implemented within 200 feet of caves. These include no herbicide application, driving on existing access roads only, and use of hand tools or small machinery only to remove vegetation. These measures would minimize inputs of chemicals and sediment into sensitive subterranean habitats. With the use of avoidance measures and BMPs, impacts to *Batrasyommodes spelaeus* are not anticipated.

Tricolored bats were observed hibernating in a cave approximately 0.2 mile from the TL upgrade locations and approximately 0.4 mile from the nearest structure replacement. Drilling or blasting within a half-mile radius of documented caves would be conducted in a manner that would not compromise the structural integrity or alter the karst hydrology of the cave. Suitable summer roosting habitat for tricolored bats occurs throughout the Project Site in trees with suitable roosting characteristics, particularly those near water sources. Approximately 84 acres of potentially suitable summer roosting habitat would be removed on the Project Site. No more than three acres of tree trimming, limbing, and/or removal is anticipated in association with the TL upgrades. TVA would remove trees in winter (November 15 to March 15) when bats are likely not on the Project Site, thereby avoiding the potential for direct effects. Streams and ponds offer foraging habitat and sources of drinking water for this species within and adjacent to the Project Site, and these would not be impacted by the Project.

No known hibernacula for gray bat, Indiana bat, or northern long-eared bat exist on the Project Site or would be impacted by the proposed actions. Survey of a cave within 200 feet of the ROW revealed that no bats were present. The Project would conduct controlled TL upgrade-related drilling and blasting within a 0.5-mile radius of documented caves. These activities would be restricted to warmer months, between March 16 and October 14, outside of winter roosting season, and would employ appropriate BMPs during vegetation clearing or herbicide use within a 200-foot radius of caves or the portals of caves that could support federally listed bats. Suitable summer roosting habitat for Indiana bat and northern long-eared bat occurs throughout the Project Site in trees with suitable roosting characteristics, particularly those near water sources. Approximately 84 acres of potentially suitable summer roosting habitat would be removed on the Project Site. No more than three acres of tree trimming, limbing, and/or removal is anticipated in association with the TL upgrades. TVA would remove trees in winter (November 15 to March 15) when the listed bats are likely not on the Project Site, thereby avoiding the potential for direct effects. Streams and ponds offer foraging habitat and sources of drinking water for all three bat species within and adjacent to the Project Site, and these would not be impacted by the Project. With seasonal restrictions on tree removal and the application of conservation measures and BMPs in relation to caves, the Proposed Action is expected to affect but not likely adversely affect the federally listed bats. In compliance with Section 7 of the ESA, TVA initiated consultation with the USFWS on December 16, 2020, regarding the potential effects of the Proposed Action on federally species listed under the ESA, including terrestrial species (Appendix A). USFWS concurred with TVA's determinations in a letter dated January 13, 2021. TVA sent a second correspondence on February 10, 2022, following survey of the TL upgrade locations. TVA determined that the Project may affect but is not likely to adversely affect the gray bat, northern long-eared bat, Indiana bat, and

the fleshy-fruit gladeceess or its critical habitat with implementation of avoidance measures. USFWS concurred with the TVA determination in a letter dated February 25, 2022.

#### 3.5.4.1.3.2.2 *Aquatic Species*

Streams within the Project Site are currently not suitable for the listed aquatic species included on Table 3-8 except for the Tuscumbia darter and round-rib elimia. Therefore, no impacts to these threatened or endangered aquatic species would occur.

The high-quality stream that supports the Tuscumbia darter and round-rib elimia would be largely avoided by the Project activities. The dense stream buffer existing along the middle reach of Wheeler Branch likely inhibits the growth of aquatic vegetation that is necessary for the Tuscumbia darter and round-rib elimia to persist. TVA would commit to conservation measures designed to allow more sunlight to penetrate this dense stream buffer, thus encouraging the growth of aquatic vegetation in the portion of Wheeler Branch where the buffer is intact. Trees with a diameter of six inches or less would be mulched on site. Smaller woody vegetation immediately adjacent to Wheeler Branch would be cleared by hand to avoid disturbing the stream. Certain larger trees would be killed by hack-and-squirt herbicide treatment and left standing to provide habitat for bats and other wildlife utilizing dead snags. These actions would allow additional sunlight to reach the stream channel and, thus, more aquatic vegetation to grow. A portion of the species-rich native plant meadow area would be established adjacent to the Wheeler Branch stream buffer. Meadow maintenance would require a prescribed fire regime that would also permeate the stream buffer and help control invasive vegetation that is blocking sunlight from the stream channel. These measures would allow more sunlight to reach the stream, while also allowing the stream buffer to serve vital ecological functions. This may expand the habitat available for the Tuscumbia darter and round-rib elimia, mitigating potential impacts to both species in the Project area.

Streams present within the TL ROW or intersecting access roads associated with the TL upgrades could potentially provide suitable habitat for federal and/or state-listed aquatic species. However, ground disturbance would be minimized, and all work would be conducted in accordance with the relevant BMPs outlined in TVA's BMP manual (TVA 2017a). With proper implementation of BMPs and adherence to CWA Section 404 and 401 permit requirements, no impacts to federal or state-listed aquatic species are anticipated from the TL upgrades.

#### 3.5.4.1.3.2.3 *Plants*

Adoption of the Proposed Action Alternative would not result in significant impacts to either state-listed or federally listed plants. TVA has designed TL upgrades to completely avoid impacting a high-quality habitat dominated by native herbaceous plants located along the Reservation–Mountain Home 161-kV TL ROW that supports multiple state-tracked species as well as the federally listed fleshy-fruit gladeceess. The proposed TL upgrades may negatively impact the small population of Michaux's gladeceess situated on the smaller, degraded cedar glade west of the higher quality site. Given that the majority of Michaux's gladeceess plants occur off of the ROW and would not be disturbed, impacts from the proposed work would not be significant.

Since the TL upgrades have been designed to avoid fleshy-fruit gladeceess, TVA determined that the proposed TL upgrade activities are not likely to adversely affect the fleshy-fruit gladeceess or its critical habitat. In compliance with Section 7 of the ESA, TVA initiated consultation with the USFWS on December 16, 2020, regarding the potential

effects of the Proposed Action on federally listed species listed under the ESA, including plant species. USFWS concurred with TVA's determinations, including the above mitigation measures, in a letter dated January 13, 2021. TVA sent USFWS a second correspondence on February 10, 2022, following survey of the TL upgrade locations. USFWS concurred with the TVA determination in a letter dated February 25, 2022. The Proposed Action would not significantly impact state or federally listed plant species.

### **3.6 Natural Areas, Parks, and Recreation**

This section describes the existing recreation resources in the project area, and the potential impacts to those resources that would be associated with the No Action and Proposed Action alternatives. Existing conditions for recreation resources are presented for the vicinity of the Project Site and the TL upgrade locations, where Project effects to this resource area could occur. The components of recreation resources analyzed include natural areas, parks, and boat ramps.

#### **3.6.1 Affected Environment**

There are no natural areas, developed parks, or outdoor recreation areas on or in the immediate vicinity of the Project Site. Natural areas in the project area include Wheeler Reservoir, located approximately 1.6 miles north of the Project Site's northern boundary; designated critical habitat of the fleshy-fruit gladeceess, located approximately 3.3 miles southeast of the Project Site's southern boundary; and Mallard-Fox Creek Wildlife Management Area (WMA), located approximately 3.6 miles northeast of the Project Site's eastern boundary. Wheeler Reservoir is currently managed for multiple uses, including wildlife habitat and various public recreation activities including boating, fishing, and camping. The designated critical habitat of the fleshy-fruit gladeceess is an area where a population of the federally endangered plant is present. The Mallard-Fox Creek WMA is managed by the Alabama Department of Conservation and Natural Resources and Division of Wildlife & Freshwater Fisheries for hunting and fishing purposes. Recreation areas in the project area include Roy Coffee Ball Park, located approximately one mile west of the Project Site's western boundary; Pleasant Grove Boat Ramp, located approximately 4.5 miles northwest of the Project Site's northern boundary; and Mallard Creek Fish Camp, located approximately 4.5 miles northeast of the Project Site's eastern boundary (Figure 3-10). Other developed recreation areas, including Lawrence County Park, Mallard Creek Recreation Area, and Lake View Boat Ramp, are all located greater than five miles from the Project Site. With the exception of the ball park, all of these recreation areas are associated with Wheeler Reservoir.

TVA would perform network upgrades to portions of its existing Reservation–Mountain Home 161-kV TL. There is one natural area (designated critical habitat for the fleshy-fruit gladeceess) near the TL upgrade locations, and no developed parks or outdoor recreation areas adjacent to the portions of the existing TL proposed for modification.

Some dispersed recreation activities, such as hunting, have occurred on the Project Site. The landowner from whom TVA purchased the site maintained hunting lease agreements with three individuals, two hunting clubs, and one private business. However, these leases expired in September 2020, following TVA's purchase of the site and will not be renewed. Hunting is currently not allowed on the site.

#### **3.6.2 Environmental Consequences**

This section describes the potential consequences to Natural Areas, Parks, and Recreation should the No Action or Proposed Action alternative be implemented.

**3.6.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to recreational activities at parks and recreation areas would occur.

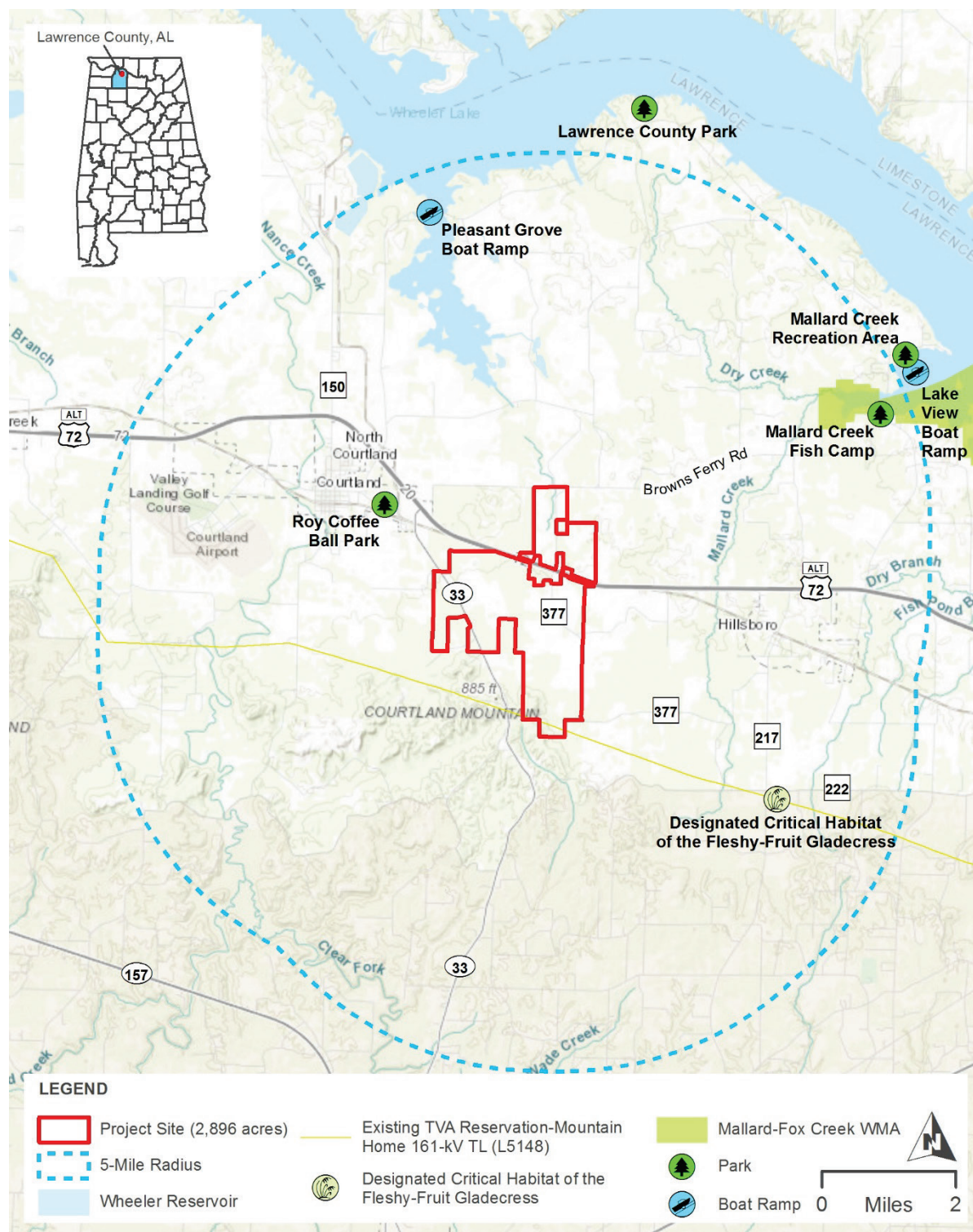
TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. TVA would continue to prohibit hunting on the site. Existing landowners in the vicinity would be limited to hunting on private land and other recreational areas in the vicinity, where existing activities would likely be accommodated. The potential future development and/or disposal of the project site could affect any recreational activities on the site but would likely have little effect on area developed recreation areas.

**3.6.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period. Because there are substantial distances between the natural areas, developed parks, and outdoor recreation areas and the Project, no impacts on these natural areas, developed parks, and outdoor recreation areas are anticipated.

Development of the Project would eliminate hunting and other dispersed recreational activities that have occurred on the Project Site. However, these dispersed recreation activities could likely be accommodated at other similar rural lands in the surrounding area. Because there are no developed parks or outdoor recreation areas adjacent to the portions of the existing TL proposed for modification, the TL upgrades should have no impact on outdoor recreation resources.





**Figure 3-10. Natural areas, parks, and recreational facilities within the vicinity of the Project Site**



### 3.7 Visual Resources

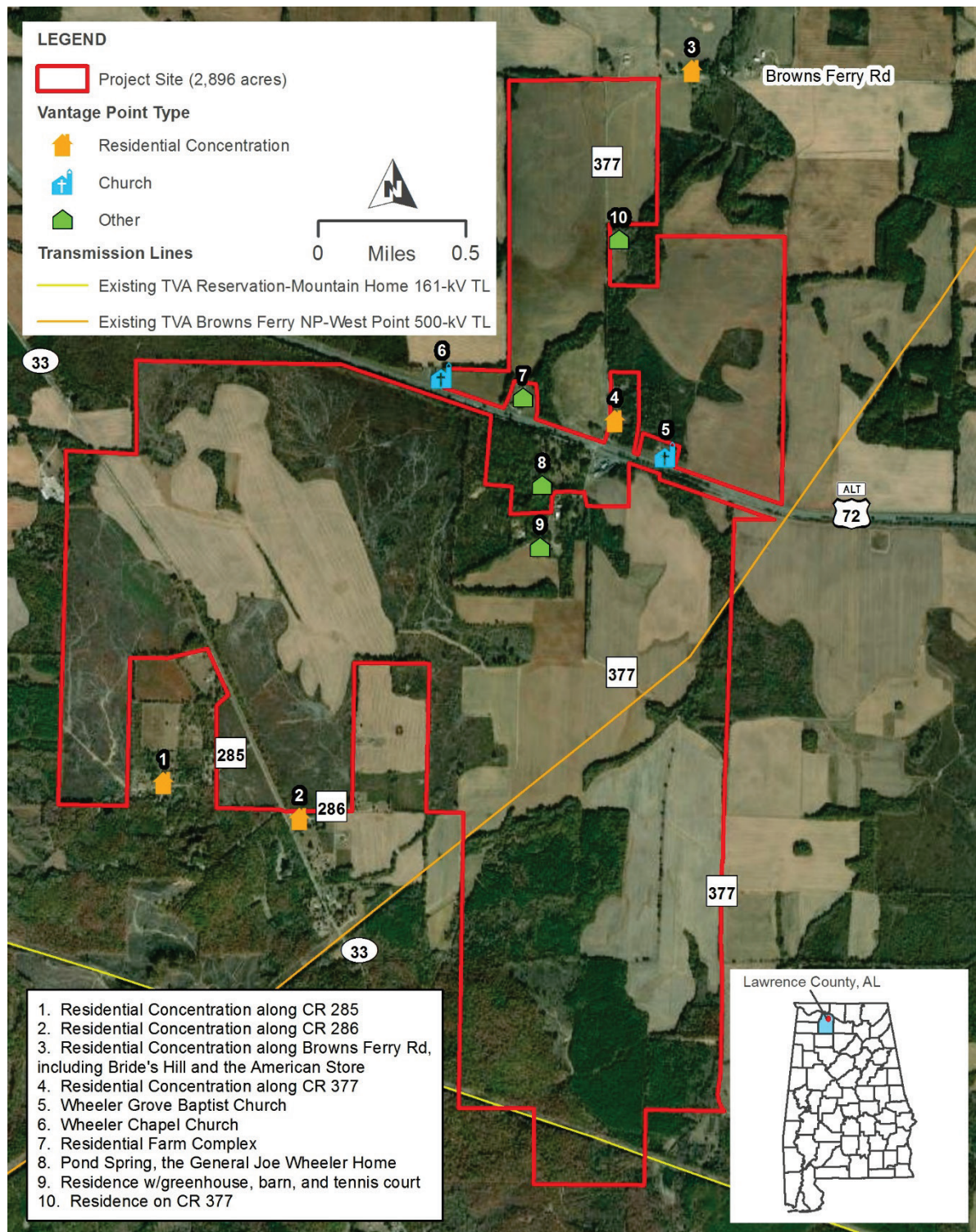
This section describes the visual character of the project area, an overview of the visual resources within and surrounding the Project Site, and the potential impacts on these visual resources and those in the TL upgrade locations that would be associated with the No Action and Proposed Action alternatives. Existing conditions for visual resources are presented in detail for the Project Site vicinity, where concentrated Project effects to visual resources could occur. Project effects are also assessed for the TL upgrade activities.

#### 3.7.1 Affected Environment

Visual resources compose the visible character of a place and include both natural and human-made attributes. Visual resources influence how an observer experiences a particular location and distinguishes it from other locations. Such resources are important to people living in or traveling through an area and can be an essential component of historically and culturally significant settings. For this analysis, the scenery management system and associated analytical assessment procedures developed by the U.S. Forest Service are adapted for use within a natural and human-built environment and integrated with planning methods used by TVA (after TVA 2016; USDA 1995). The general project area viewshed is evaluated based on its scenic attractiveness and scenic integrity. Scenic attractiveness is a measure of the scenic beauty of a landscape based on perceptions of the visual appeal of landforms, waterways, vegetation, and the human-built environment. Scenic attractiveness is assessed as either distinctive, typical/common, or indistinctive. As adapted for this analysis, scenic integrity measures the degree of visual unity of the natural and cultural character of the landscape. Scenic integrity is evaluated as either low, moderate, or high. This analysis also considers the existing character of the Project Site as an important factor in understanding the affected environment.

The project area is a rural-agricultural area with isolated single-family homes, small rural-residential concentrations, and some commercial and industrial development adjacent to highways. The project area is characterized by flat terrain to gently rolling hills interspersed with stream drainages, generally flowing northward toward the Tennessee River. Scenic attractiveness of the project area is rated as typical or common of a rural-agricultural and sparsely residential area. Scenic integrity is assessed as moderate to high due to the relative unity of the surrounding natural and cultural character. Photo 3-1 and Photo 3-2 show general views of the Project Site.

Prominent vantage points surrounding the Project Site, where more concentrated visual effects from the Project could occur, include four small rural-residential concentrations, one west of SR 33, along CR 285 and one east of SR 33, along CR 286, both adjacent to the southwestern portion of the Project Site, one east of CR 377, along Browns Ferry Road, adjacent to the northern portion of the Project Site, and one north of US 72A, along CR 377; two churches along US 72A; a residential farm complex along US 72A; Pond Spring, the General Joe Wheeler Home, along US 72A; and two residences, one south of Pond Spring and one on CR 377 between Browns Ferry Road and US 72A (Figure 3-11; Photo 3-3 through Photo 3-12). US 72A is oriented east-west, bisecting the northern and southern portion of the Project Site. SR 33 is oriented north-south in the western portion of the Project Site and CR 377 is oriented north-south in the eastern portion of the Project Site. The long-range views from US 72A as it crosses the Project Site are generally obscured by mature trees, in particular to the south of the highway. Portions of the agricultural land to the north of US 72A are visible from the highway. Two TLs cross the southern portion of the Project Site (Figure 3-11).



**Figure 3-11. Prominent vantage points in the vicinity of the Project Site**





**Photo 3-1. View of the northern portion of the Project Site, looking north from US 72A (Google Street View, May 2019)**



**Photo 3-2. View of the southern portion of the Project Site, looking east from SR 33 (Google Street View, September 2013)**

Of the four small rural-residential concentrations near the Project Site, the closest is adjacent to the southwestern portion of the Project Site, west of SR 33, along CR 285. Most of the residences were built in the mid-1960s to early 1970s (USGS 2019). The residences primarily consist of one-story ranch-style houses on lots surrounded by mature hardwoods and pines and/or among agricultural fields framed by mature trees (Photo 3-3).

The small residential concentration east of SR 33, along CR 286, is also adjacent to the southwestern portion of the Project Site. This concentration consists of one-story ranch-style houses that were built in the early to late 1990s (USGS 2019). The residences are generally on lots surrounded by agricultural fields framed by mature trees (Photo 3-4).

The small residential concentration east of CR 377, along Browns Ferry Road, is adjacent to the northern portion of the Project Site. This concentration consists of one-story brick ranch-style houses that were built in the middle to late 1960s (USGS 2019). The residences are generally on lots surrounded by agricultural fields framed by mature trees (Photo 3-5). This residential concentration also includes Bride's Hill, an early example of a Tidewater cottage, and the American Store, an early example of a rural community store. These historic properties are described in more detail in Section 3.10.

The small residential concentration north of US 72A, along CR 377, is partially surrounded by the northern portion of the Project Site. This concentration consists of one-story style houses that were built in the middle to late 1960s (USGS 2019). Long-range views in all directions from the residences are partially obscured by mature trees as well as those framing fields and/or roads nearby (Photo 3-6).



**Photo 3-3. Small residential concentration along CR 285, adjacent to and west of the southwestern portion of the Project Site (red boundary) (Google Earth 2016)**





**Photo 3-4. Small residential concentration along CR 286, adjacent to the southwestern portion of the Project Site (red boundary) (Google Earth 2016)**



**Photo 3-5. Small residential concentration, including Bride's Hill and the American Store, along Browns Ferry Road, adjacent to the northern portion of the Project Site (red boundary) (Google Earth 2016)**





**Photo 3-6. Small residential concentration north of US 72A, along CR 377, partially surrounded by the northern portion of the Project Site (red boundary) (Google Earth 2020)**



**Photo 3-7. Wheeler Grove Baptist Church, looking north from US 72A (Google Street View, May 2019)**

Wheeler Grove Baptist Church, located on the north side of US 72A, is partially surrounded by the Project Site. Long-range views in all directions from the church are partially obscured by mature trees on the church property as well as those framing fields and/or roads nearby (Photo 3-7). A second church, Wheeler Chapel Church is also located on the north side of US 72A, adjacent to the western boundary of the Project Site. Long-range views from the church are partially obscured by mature trees on the church property as well as those framing fields and/or roads nearby (Photo 3-8).



**Photo 3-8. Wheeler Chapel Church, looking north from US 72A (Google Street View, May 2019)**

One residential farm complex is located on the north side of US 72A, partially surrounded by the Project Site. Long-range views in all directions from the residential complex are partially obscured by mature trees on the property as well as those framing fields and/or roads nearby (Photo 3-9).

A residence on CR 377 between Browns Ferry Road and US 72A is partially surrounded by the Project Site. Long-range views in all directions from the residence are partially obscured by mature trees as well as those framing fields and/or roads nearby (Photo 3-10). A residence, an associated greenhouse complex, a barn, and a tennis court are located within the Project Site along a private drive extending west from CR 377, south of US 72A. Long-range views in all directions from the residences are partially obscured by mature trees as well as those framing fields and/or roads nearby (Photo 3-11). Pond Spring, the General Joe Wheeler Home, is located just south of US 72A and is partially surrounded by the Project Site. The 50-acre property includes 12 historic buildings, gardens, and archaeological features. Long-range views in all directions from Pond Spring are partially obscured by mature trees as well as those framing fields and/or roads nearby (Photo 3-12). This historic property is described in more detail in Section 3.10.





**Photo 3-9. Residential Farm Complex, looking north from US 72A (Google Street View, May 2019)**



**Photo 3-10. A residence on CR 377 between Browns Ferry Road and US 72A, partially surrounded by the Project Site (red boundary) (Google Earth 2020)**





**Photo 3-11. A residence, associated greenhouse complex, barn, and tennis court, adjacent to the Project Site (red boundary) (Google Earth 2020)**



**Photo 3-12. Pond Spring, the General Joe Wheeler Home, adjacent to the Project Site (red boundary) (Google Earth 2020)**

### **3.7.2 Environmental Consequences**

This section describes changes to the appearance of the Project Site should the Proposed Action or No Action Alternative be implemented. For this analysis, the construction and operation phases are treated separately as construction would be temporary and result in different visual impacts than the longer-term operation phase.

### **3.7.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related changes to the appearance of the Project Site would result.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would have little effect on the appearance of the site. The establishment of the species-rich native plant meadow as described in Section 2.2, if located adjacent to one or more public roads, would increase the scenic attractiveness of the site. The potential future development and/or disposal of the site could result in adverse visual impacts by converting it to a less natural and more industrial appearance. Depending on the type of development, the visual effects could be greater than those of the Proposed Action Alternative.

### **3.7.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Visual concerns are often associated with both large- and small-scale solar facilities and their electrical infrastructure. The Project Site consists of flat to gently rolling terrain, and the Project would convert what is largely now agricultural, rural-residential, and forested lands to an industrial use mostly consisting of low-profile PV arrays. Figure 2-2 and Figure 2-3 show the proposed Project elements. Photo 3-13 and Photo 3-14 show representative views of the type of solar panels proposed for the Project. From vantage points surrounding the Project Site along US 72A, SR 33, CR 377, Browns Ferry Road, and CR 286, the manufactured, structured appearance of the facility would be most apparent. The Project would likely be more visually intrusive in the morning and late afternoon, when the panels would be facing east or west, respectively, at their maximum tilt, with the upper edge of the panels about eight feet from the ground. This effect would be least at mid-day when the panel profile would be lying flat and about five feet above ground.





**Photo 3-13. Single-axis, tracking photovoltaic system with panels showing some tilt as viewed from the east or west**



**Photo 3-14. The backside of example solar panels in early morning or late afternoon configuration**





**Photo 3-15. Photo-rendering of installed PV arrays as seen looking north from the Norfolk Southern railroad tracks and across US 72A**





**Photo 3-16. Photo-rendering of installed PV arrays (in background) as seen looking southwest from Bride's Hill**





**Photo 3-17. Photo-rendering of installed PV arrays (in background) as seen looking southeast from the northeastern portion of the Pond Spring property**



Long-range views from the prominent vantage points near the Project Site along US 72A and from the small residential concentration west of SR 33 along CR 285 are generally obscured by mature trees as well as those framing fields and/or roads nearby. Because most of the mature tree buffers are comprised of deciduous trees, their effectiveness in blocking views of the Project would be reduced from late autumn through early spring. Long-range views from travelers along US 72A are generally obscured by mature trees except for portions to the north of US 72A, where Project elements would be visible (Photo 3-15). Project elements would also be visible from the majority of CR 377 and the portion of SR 33 between CR 281 and CR 286. Because of the relative openness of the surrounding land and proximity to the Project Site, views of the project components from the northeastern portion of the Pond Spring property and the residential properties along Browns Ferry Road, CR 377, and CR 286 would be more impacted than views from other properties near the Project Site (Photo 3-16 and Photo 3-17). Project elements would be visible from most of the residences along CR 286. Although the solar panels would be installed between 50 feet and several hundred feet from these roadways and the anti-reflective PV panel surfaces would minimize glare and reflection, visual impacts to travelers along US 72A, CR 377, and SR 33 and the residents along Browns Ferry Road, CR 377, and CR 286 are expected to be moderate due to the visibility of relatively large portions of the Project elements.

TVA proposes to construct the Project substation, encompassing approximately 5.7 acres at the southern extent of the Project Site, to connect the solar PV facility to TVA's existing Reservation-Mountain Home 161-kV TL. The BESS would be constructed adjacent to the substation. This area is surrounded by mature trees and the proposed lighting for the BESS and the substation would be fully shielded or would have internal low-glare optics, so it is unlikely that the substation, potential BESS, or associated lighting would be visible to travelers along CR 377 or from residences in the vicinity, the closest of which is approximately 1,500 feet to the east.

Construction activities would temporarily alter the visual character of the project area. During construction, heavy machinery would be present, changing the visual aspects from project area vantage points. Within the 1,459-acre area to be developed or temporarily affected for the Project, trees and other tall vegetation would be removed, and portions of the area would be graded, changing the contour, color, and texture of the scenery attributes. The Project Site would appear as a mixture of neutral colors such as browns and grays due to earthmoving, road construction, and concrete activities. Water would be used to keep soil from aerosolizing; thus, dust clouds are not anticipated. Visual impacts from construction would be minimal at night, as most construction is anticipated to occur during the day. Erosion control silt fences and sediment traps would be removed once construction is complete, and bare areas would be promptly vegetated.

Indirect impacts to visual resources in the Project Site vicinity may occur due to increased traffic and movement of heavy machinery on the Project Site and along local roads. Overall, there would be minor direct and indirect impacts to visual resources during the construction phase of the Proposed Action. However, these impacts would be temporary and would last approximately 24 to 36 months.

Overall, the visual alteration from agricultural land in an area where scenic integrity is rated as moderate to high due to the relative unity of the surrounding natural and cultural character to a large solar facility is expected to result in moderate adverse visual impacts. TVA would manage up to 150 acres of the Project Site as a species-rich meadow, situated in areas that currently support croplands or in areas that were timbered in the past, which



could partially offset the visual impacts in those areas. Due to the relatively substantial mature tree buffers in some areas but mostly open agricultural fields in others, visual impacts during the operations phase of the Project would be minor to moderate in the immediate vicinity and minor to minimal on a larger scale, due to variation of the visual attributes of the project area as distance from the Project increases.

TVA would perform network upgrades to portions of its existing Reservation–Mountain Home 161-kV TL. This TL extends through a mix of forested areas and agricultural fields with scattered residences and some small residential concentrations. If used, a helicopter would be visible to these residences during the installation of OPGW in the vicinity, which would affect individual residences for no more than a few days. Other equipment associated with the TL upgrades may also be visible for a few days while in the vicinity of individual residences. Modifications to the existing TL would likely be visible from several residences and travelers along major roadways in the vicinity, including CR 222, CR 217, CR 434, CR 460, SR 24, and CR 61. The replacement of existing structures with taller metal structures would increase their visibility. However, these and other modifications of the TL are not expected to greatly change the visual effects to nearby residences. Overall, the transmission system upgrades would likely result in minor impacts to the visual resources in the vicinity of the TL upgrade locations.

### **3.8 Noise**

This section provides an overview of the existing ambient sound environment in the project area, and the potential impacts to the ambient sound environment that would be associated with the No Action and Proposed Action alternatives. Existing conditions for noise are generally discussed in relation to the vicinity of the Project Site and TL upgrade locations and presented in detail for the Project Site vicinity, where concentrated, longer term Project effects to noise receptors could occur. Project effects are also assessed for the TL upgrade activities.

#### **3.8.1 Affected Environment**

Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Noise levels are computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by the USEPA and has been adopted by most federal agencies (USEPA 1974). A DNL of 65 A-weighted decibels (dBA) is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities such as construction. The A-weighted sound level represents the approximate frequency response characteristic of the average young human ear. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by USEPA as a level below which there is no adverse impact (USEPA 1974). For reference, approximate noise levels (measured in dBA) of common activities/situations are provided in Table 3-9.

**Table 3-9. Common sounds and their levels**

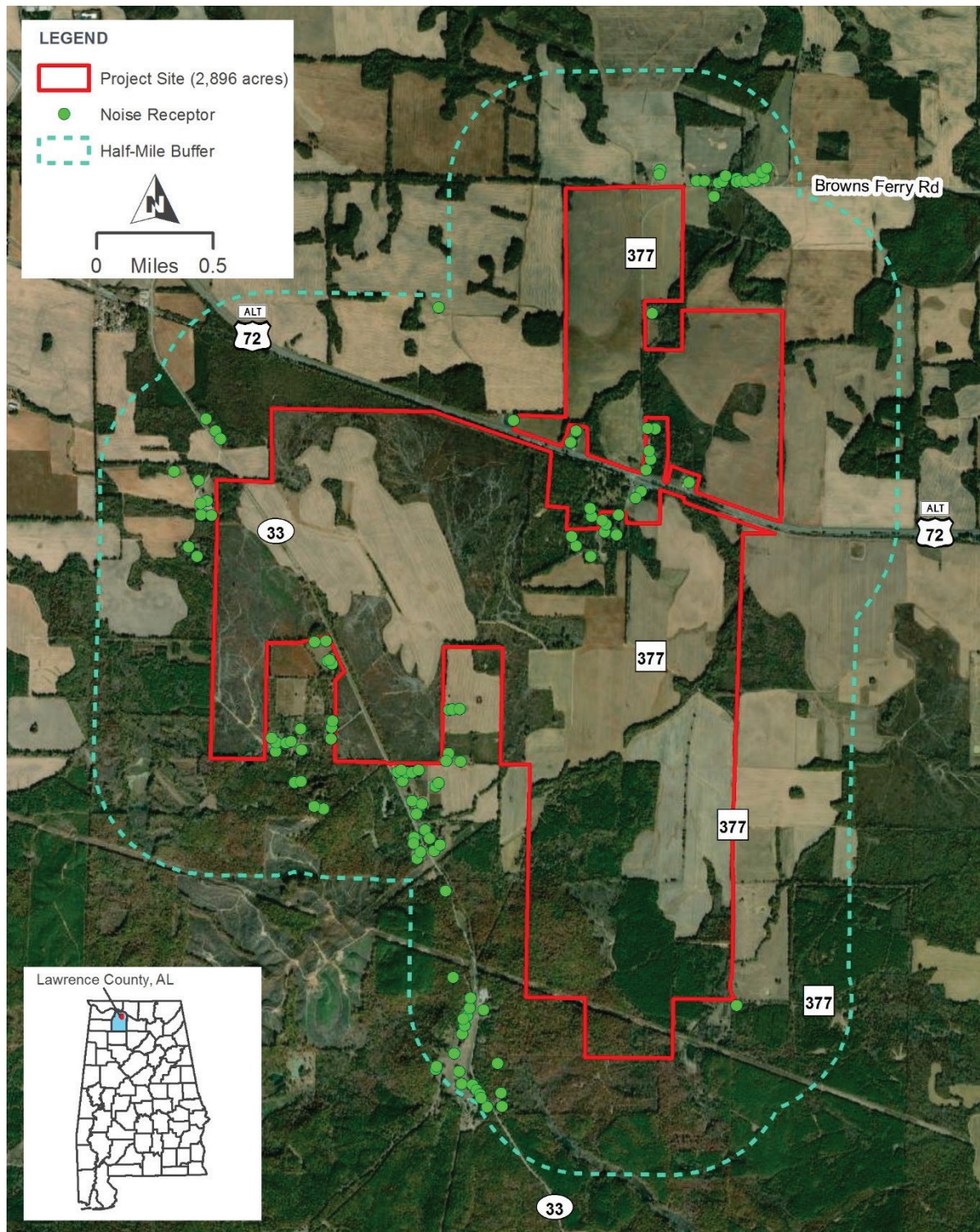
<b>Outdoor</b>	<b>Sound Level (dBA)</b>	<b>Indoor</b>
<b>Motorcycle</b>	100	Rock band
<b>Gas lawnmower at 3 feet</b>	90	Food blender at 3 feet
<b>Downtown (large city)</b>	80	Garbage disposal
<b>Heavy traffic at 150 feet</b>	70	Vacuum cleaner at 10 feet
<b>Normal conversation</b>	60	Normal speech at 3 feet
<b>Quiet urban daytime</b>	50	Dishwasher in next room
<b>Quiet urban nighttime</b>	40	Theater, large conference room

Source: USEPA 1974

Noises occurring at night generally produce a greater annoyance than do noises of the same levels occurring during the day. People generally perceive intrusive noise at night as being 10 dBA louder than the same level of noise during the day. This perception is largely because background environmental sound levels at night in most areas are about 10 dBA lower than those during the day (USEPA 1974).

The Project Site is within an agricultural, rural-residential, and forested area of northeastern Lawrence County. Ambient noise at the Project Site consists mainly of agricultural sounds, such as noises from farm machinery; natural sounds, such as from wind and wildlife; and moderate traffic sounds. Noise levels of these types generally range from 45 to 55 dBA (USDOT 2015). A portion of the Norfolk Southern railroad and several roads bisect the Project Site, including heavily traveled US 72A and less-traveled state and county roads. Noise from freight trains traveling at 20 miles per hour measures around 88 dBA at a distance of 50 feet (Southwest LRT 2015). Trains using horns must not exceed 110 dB to be in accordance with Federal Railroad Administration requirements (FRA 2020). Noise from highways typically range from 70 to 80 dB at a distance of 50 feet (Corbisier 2003).

The Project Site and a surrounding 0.5-mile radius were examined to identify potential noise-sensitive receptors. Noise-sensitive receptors are defined as those locations or areas where dwelling units or other fixed, developed sites of frequent human use occur. Approximately 118 noise-sensitive receptors are within the area examined (Figure 3-12). These primarily consist of residential farm complexes, associated outbuildings, and non-residential agricultural complexes, with each building generally counted as one receptor. Pond Spring, the General Joe Wheeler Home, is located along US 72A, immediately adjacent to the Project Site. Pond Spring contains 12 historic buildings and gardens and receives an average of 2,700 visitors annually. The two churches along US 72A are also noise-sensitive receptors. Other residential and rural-residential concentrations of noise-sensitive receptors occur around the perimeter of the Project Site, ranging from less than 100 feet to approximately 4,700 feet from proposed PV array locations. Residential concentrations are primarily located near the southwestern portion of the Project Site.



**Figure 3-12. Noise-sensitive receptors in the Project Site vicinity**

### **3.8.2 Environmental Consequences**

This section describes the potential impacts to the ambient sound environment should the Proposed Action or No Action Alternative be implemented.

#### **3.8.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts on the ambient sound environment would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would result in little change in sound levels on and in the immediate vicinity of the site. The potential development and/or disposal of the site could impact area noise receptors.

#### **3.8.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Direct and indirect noise impacts associated with implementation of the Proposed Action would primarily occur during construction. Construction equipment produces a range of sounds while operational. Noisy construction equipment, such as delivery trucks, dump trucks, water trucks, service trucks, chain saws, skidders, bulldozers, tractors, and/or low ground-pressure feller-bunchers, produce maximum noise levels at 50 feet of approximately 84 to 85 dBA. This type of equipment may be used for approximately 24 to 36 months at the Project Site.

Construction noise would cause temporary and minor adverse impacts to the ambient sound environment around the Project Site vicinity. Several residences and residential and non-residential agricultural complexes are located within a 0.5-mile distance from the Project Site and would temporarily experience heightened noise during construction, primarily from pile-driving activities. However, when the agricultural complexes are active in the fall and early winter, these facilities likely produce ambient sounds that are at or higher than the typical 45 to 55 dBA in the project area, and these existing noises would help make effects from the Project more minimal. Additionally, construction would primarily occur during daylight hours, between sunrise and sunset; therefore, the Project would not affect ambient noise levels at night during most of the construction period. Most of the proposed equipment would not be operating on site for the entire construction period but would be phased in and out according to the progress of the Project.

The activity likely to make the most noise for an extended time period would be pile driving during the installation of the PV array supports, which would be completed in six to 12 months. Standard construction pile drivers are estimated to produce between 90 to 95 dBA at a distance of 50 feet (USDOT 2015). The piles supporting solar panels would be driven into on-site soils and potentially into limestone, depending on the depths of piles and on the underlying residuum of limestone in areas where piles would be installed; however, overburden soil thickness will not be confirmed until detailed geotechnical studies occur prior to construction. Construction workers would wear appropriate hearing protection in

accordance with Occupational Safety and Health Act (OSHA) regulations. Noise-sensitive receptors near the TL upgrade locations would temporarily experience heightened noise during daylight hours primarily during pole drilling for the replacement TL pole structures, if any replacements would occur. Blasting may be required to install the array foundations and pole structures if bedrock is encountered, but these effects would be associated with some pilings and structures and would likely be short term. Noise receptors near the existing TL would also experience temporarily heightened noise during the potential two-week installation of OPGW by helicopter.

Existing ambient noise in the project area generally ranges from 45 to 55 dBA and consists mainly of agricultural sounds, such as noises from farm machinery; natural sounds, such as from wind and wildlife; and moderate traffic sounds. Within 50 feet of US 72A and SR 33 and other larger roads adjacent to the Project Site, traffic sounds may reach 70 to 80 dBA during high traffic periods (Corbisier 2003). Near the railroad, noises would reach 88 dBA or higher when trains travel through the project area. Because construction would only occur during the day for most of the construction period, at the same time that seasonal agricultural activities and more traffic and train noise would occur, there would not be a significant difference in noise levels with implementation of the Project other than pile and pole driving activities during construction. Unlike noise from seasonal agricultural activities and intermittent highway traffic and train noise, pile driving noise would be continuous during a large portion of the construction period.

Following completion of construction activities, the ambient sound environment would return to existing levels or lower levels below, by eliminating the seasonal use of some agricultural equipment. The moving parts of the PV arrays would be electric-powered and produce little noise. The central inverters would produce noise levels of approximately 65 dBA at 33 feet; the inverters are interior to the PV array blocks and thus relatively far from the Project Site boundaries and nearby noise receptors. The proposed Project substation would emit approximately 50 dBA at 300 feet. The closest noise receptors are more than 100 feet from the central inverters. The main sources of noise from the BESS would be from inverters and heating and cooling systems; these noise levels are likely similar to those of the central inverters and substation. No noise receptors are within 500 feet of the proposed Project substation or the BESS location. As such, noise impacts from these Project components are anticipated to be minimal to negligible.

The periodic mowing of the Project Site to manage the height of vegetation surrounding the solar panels would produce sound levels comparable to those of agricultural operations in the project area; however, Project-related mowing would occur at less frequent intervals than typical agricultural operations.

Overall, implementation of the Proposed Action would result in minor, temporary adverse impacts to the ambient noise environment in the project area during construction, and minimal to negligible impacts during operation and maintenance of the solar facility.

### **3.9 Air Quality and Greenhouse Gas Emissions**

This section describes existing air quality and GHG emissions in the project area and the potential impacts on air quality and GHG emissions that would be associated with the No Action and Proposed Action alternatives. Existing conditions for air quality and GHG emissions are presented for the vicinity of the Project Site and the TL upgrade locations, where Project effects to these resource areas could occur.



### 3.9.1 Affected Environment

Ambient air quality is determined by the type and concentration of pollutants emitted into the atmosphere, the size and topography of the air shed in question, and the prevailing meteorological conditions in that air shed. Through its passage of the Clean Air Act and its amendments, Congress mandated the protection and enhancement of our nation's air quality. USEPA established the National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants to protect the public health and welfare: sulfur dioxide (SO<sub>2</sub>), ozone, nitrogen dioxide, particulate matter whose particles are less than or equal to 10 micrometers (PM<sub>10</sub>), particulate matter whose particles are less than or equal to 2.5 micrometers (PM<sub>2.5</sub>), carbon monoxide (CO), and lead.

The primary NAAQS were promulgated to protect public health, and the secondary NAAQS were promulgated to protect public welfare (e.g., visibility, crops, forests, soils, and materials) from any known or anticipated adverse effects of air pollutants. Areas in compliance with the NAAQS are designated "attainment" areas. Areas in violation of the NAAQS are designated as "nonattainment" areas, and new sources being located in or near these areas may be subject to more stringent air permitting requirements. Nonattainment areas are usually defined by county. Areas that cannot be classified on the basis of available information for a particular pollutant are designated as "unclassifiable" and are treated as attainment areas unless proven otherwise. Finally, areas that were formerly designated as nonattainment for a pollutant and later come into attainment, are then categorized as "maintenance" for that pollutant for the next 20 years, assuming they continue to meet the NAAQS for that pollutant. If an area remains in attainment for a 20-year maintenance period, the status reverts back to normal attainment.

#### 3.9.1.1 Regional Air Quality

The project area in rural Lawrence County has little development in the vicinity apart from that related to rural-residential and agricultural uses. Denser development is approximately six to eight miles to the east of the Project Site in Morgan County, and the city of Decatur, Alabama, is located approximately 30 miles farther east-northeast in Madison County, where the Huntsville suburban area has been expanding in recent years. Lawrence County, Morgan County, and Madison County are in attainment with NAAQS for all pollutants (USEPA 2020a).

Table 3-10 presents the most recent USEPA emission inventory data for the most prevalent NAAQS pollutants for Lawrence County (USEPA 2020b). These data represent emissions from all stationary and mobile source human activities. The table also provides a comparison of project area emissions with the more populated and industrialized Madison County, Alabama, to the east. The predominantly rural project area has relatively low emissions in comparison to Madison County and is expected to have generally good air quality.

**Table 3-10. Average 2017 emissions of NAAQS pollutants in Lawrence County, as compared with Madison County**

Pollutants	Emissions (tons per year)	
	Lawrence County	Madison County
<b>Carbon Monoxide</b>	10,853	49,808
<b>Nitrogen Oxides (NO<sub>x</sub>)</b>	1,827	7,378
PM <sub>10</sub>	5,536	10,605
PM <sub>2.5</sub>	1,156	2,442
<b>Sulfur Dioxide (SO<sub>2</sub>)</b>	37	140



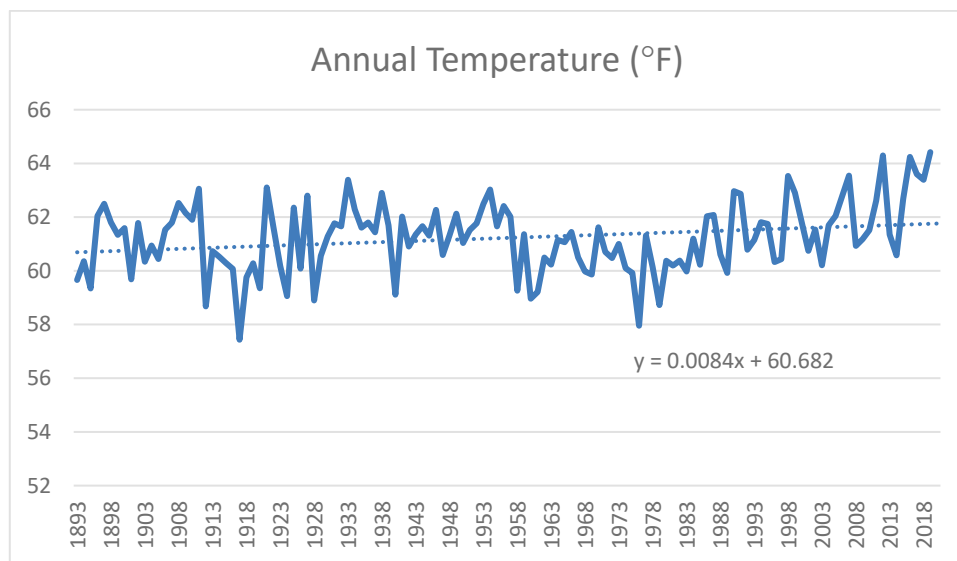
Pollutants	Emissions (tons per year)	
Volatile Organic Compounds (VOCs)	12,922	18,412

Source: USEPA 2020b

### 3.9.1.2 Regional Climate

Weather conditions determine the potential for the atmosphere to disperse emissions of air pollutants. Based on climate data for Lawrence County since 1895, the coldest month is January, with average maximum and minimum temperatures of 51.1°F and 29.7°F, respectively. The warmest month is July, with average maximum and minimum temperatures of 90.5°F and 67.2°F, respectively. Precipitation is highest from November through May and averages 53.41 inches per year (NOAA 2020). Average annual snowfall is 1.8 inches per year (SBP 2020).

Figure 3-13 is a chart of annual average temperatures over the 125-year period (1893-2018) of record for a Muscle Shoals, Alabama, monitoring station, located approximately 19 miles west of the Project Site (IEM 2020). The dotted trend line on the chart, as indicated by the embedded line slope equation, shows a small (approximately 1°F) increase in average annual temperature (based on monthly average mean temperatures) over the period of record, although there appears to be some cyclical variation.



**Figure 3-13. Annual average temperature for Muscle Shoals, AL over 125-year record**

### 3.9.1.3 Greenhouse Gas Emissions

GHGs include natural and man-made compounds that disperse throughout the earth's atmosphere. These compounds absorb a portion of Earth's infrared radiation and reemit some of it back to the ground, thus keeping surface temperatures warmer than they would be otherwise. In this way, GHGs act as insulation and contribute to the maintenance of global temperatures. As the levels of GHGs in the atmosphere increase, the result is an increase in temperature on earth, commonly known as global warming. Climate change associated with global warming produces negative economic and social consequences across the globe through changes in weather (e.g., more intense hurricanes, greater risk of forest fires, flooding) (USGCRP 2018). As shown in Figure 3-13, for the project area in northeastern Alabama, there is currently a slight long-term upward trend in temperature;

approximately 1°F over 125 years. This change, like that of much of the southeastern US, is less than many other parts of North America (USGCRP 2018).

Apart from water vapor, the primary GHG emitted by human activities in the US is carbon dioxide (CO<sub>2</sub>), representing approximately 82 percent of total GHG emissions in the US (USEPA 2020c). The largest source of CO<sub>2</sub> and of overall GHG emissions is fossil fuel combustion. US emissions of the GHG methane, which have declined from 1990 levels, result primarily from enteric fermentation (digestion) associated with domestic livestock, decomposition of wastes in landfills, coal mining, and leakage of natural gas from petroleum drilling and production activities. Agricultural soil management is the major source of the GHG nitrous oxide emissions in the US, representing approximately 74 percent of its emissions from human activities (USEPA 2020c). GHG emissions from the TVA power system are described in TVA's 2019 IRP Final EIS (2019a).

### **3.9.2 Environmental Consequences**

This section describes the potential impacts to climate and air quality should the Proposed Action or No Action Alternatives be implemented.

#### **3.9.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts on climate or air quality would result.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would result in little change in emissions of air pollutants, including GHGs, in the project area. The potential future development and/or disposal of the site has the potential to result in an increase in emissions, subject to applicable regulations.

#### **3.9.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period. Minor direct impacts to air quality would be anticipated as a result of construction and operation of the Project. Temporary impacts to GHG emissions expected during construction would be minimal. The Proposed Action would have longer term, minor beneficial impacts to air quality by increasing the capacity of non-emitting generating facilities providing power to the TVA system and offsetting the need for fossil-fuel power generation and its associated emission rates.

##### **3.9.2.2.1 Regional Air Quality**

The majority of potential air quality impacts associated with the Proposed Action would occur during construction. Construction activities would create emissions from construction equipment and vehicles, contracted employees' personal vehicles, and fugitive dust suspension from clearing, grading, and other activities. Tree debris from clearing would be removed by either burning or chipping and grinding. As burning may occur, this could generate temporary localized air quality impacts due to smoke particles and gases. Any such burning of vegetative debris would be done in accordance with any local ordinances or

burn permits and is not expected to have any health consequences for this sparsely populated rural area.

The use of construction equipment would cause a minor temporary increase in GHG emissions during construction activities. Combustion of gasoline and diesel fuels by internal combustion engines (haul trucks and off-road vehicles) would generate local emissions of PM, nitrogen oxides (NO<sub>x</sub>), CO, volatile organic compounds (VOCs), and SO<sub>2</sub>. The total amount of these emissions would be small and, overall, would result in negligible air quality impacts.

Approximately 95 percent (by weight) of fugitive emissions from vehicular traffic over paved and unpaved roads would be composed mainly of particles that would be deposited near the roadways, along the routes taken to reach the Project Site. As necessary, fugitive dust emissions from construction areas and paved and unpaved roads would be mitigated using BMPs including wet suppression. Wet suppression can reduce fugitive dust emissions from roadways and unpaved areas by as much as 95 percent. Therefore, direct impacts to air quality associated with construction activities would be expected to be minor with appropriate mitigation.

#### **3.9.2.2.2 Regional Climate**

No noticeable direct or indirect impacts to the local or regional climate would result from the construction and operation of the proposed Project. Local or regional climate effects can occur, for example, with major changes in land use that affect the hydrological cycle, or that create large impervious surfaces, thus changing the radiative heat balance over a large area. The Project would change the surface characteristics somewhat, but it would have little effect on soil permeability and hydrologic characteristics of the developed area. Vegetation would still grow under and around the solar panels, tending to maintain a landscape with significant evapotranspiration of precipitation, as opposed to creating significant runoff of precipitation, as happens with urban development, which can create a “heat island” effect. Therefore, average temperatures of the developed area are not expected to change significantly due to the proposed development.

#### **3.9.2.2.3 Greenhouse Gas Emissions**

The use of construction equipment would cause a minor temporary increase in GHG emissions during construction activities. Combustion of gasoline and diesel fuels by internal combustion engines (trucks and off-road vehicles) at the site and combustion of jet fuel by a helicopter along the existing TLs during the two-week installation of OPGW, if this method is determined the most feasible, would generate emissions of CO<sub>2</sub> and very small amounts of other GHGs such as methane and nitrous oxide. Additional GHG emissions would be due to transporting materials and workers to the Project location, and GHGs would be emitted in the US or globally for production and transportation of the materials used for construction. The production of construction materials is expected to represent the largest portion of the Project-related GHG emissions. The total GHG emissions due to construction should eventually be offset by Project operation over the long term, assuming that the electricity generated by the Project would offset some fossil-fuel-based electricity generation and associated GHG emissions.

Tree and other tall vegetation removal during construction of the Project would represent a minor loss of potential carbon sequestration, especially given that the majority of the project area is currently fields and open land. Trees and other tall vegetation currently remove CO<sub>2</sub> from the air and sequester it as biomass. The loss of this carbon sink would constitute a

minor adverse direct and indirect impact as sequestration would have continued for the life of the vegetation and long into the future, assuming that other changes on the Project Site did not result in any deforestation. The loss of the carbon sink from tree removal would be at least partially offset by the increased sequestration of CO<sub>2</sub> by the permanent grass- and forb-dominated vegetation, relative to CO<sub>2</sub> sequestration by row crops, that would be maintained on the solar facility site.

The operation of the Project is not anticipated to have any negative impacts to air quality or GHG emissions. No emissions would be produced by the operation of the solar facility or electrical lines. However, there is a possibility that sheep grazing could be integrated with the solar PV facility, thus adding some GHG emissions in the form of methane from enteric fermentation.

Minor emissions would occur during maintenance activities, including facility inspections and periodic mowing (unless sheep are substituted for mowing). Conversely, overall emissions of air pollutants from the TVA power system would decrease during operation of the solar facility as the nearly emissions-free power generated by the solar facility would offset the need for power that would otherwise be generated, at least in part, by the combustion of fossil fuels. The BESS would contribute to emission reductions by making emissions-free power generated by the solar facility available for use at times of peak energy demand such as late evenings and early winter mornings when solar generation is not available. The use of this stored energy would offset peak generation that would likely otherwise be provided by natural gas-fired generation. The reduction in GHG emissions resulting from the operation of the solar facility and the BESS would have little noticeable effect on regional or larger scales. It would, however, be a component of the larger ongoing system-wide reduction in GHG emissions from the TVA power system through reducing the need for fossil-fuel based electricity generation. The adverse impacts of GHG emissions and the beneficial impacts of TVA's reduction in GHG emissions are described in more detail in the TVA 2019 IRP (2019a).

### **3.10 Cultural Resources**

This section describes the existing cultural resources in the project area, and the potential impacts to those resources that would be associated with the No Action and Proposed Action alternatives. Existing conditions for cultural resources are presented for the vicinity of the Project Site and the TL upgrade locations, where Project effects to cultural resources could occur. The components of cultural resources analyzed include archaeological and architectural properties.

#### **3.10.1 Affected Environment**

Cultural resources are properties and places that illustrate aspects of prehistory or history or have long-standing cultural associations with established communities and/or social groups. Cultural resources may include archaeological sites, unmodified landscapes and discrete natural features, modified landscapes, human-made objects, structures such as bridges or buildings, and groups of any of these resources, sometimes referred to as districts.

Section 106 of the NHPA, as amended (54 U.S.C. § 300101 et seq.), addresses the effects of federal and/or federally funded projects on tangible cultural resources—that is, physically concrete properties—of historic value. The NHPA provides for a national program to support both public and private efforts to identify, evaluate, and protect the nation's important cultural resources. Once identified, these resources are evaluated for inclusion in

the NRHP maintained by the National Park Service. Tangible cultural resources may qualify for inclusion in the NRHP if they are 50 years of age or older (unless in exceptional cases) and if found to embody one or more of four different types of values, or criteria, in accordance with 36 CFR § 60.4:

- Criterion A: association with events that have made a significant contribution to the broad patterns of our history. Such events may include a specific occurrence or pattern of occurrences, cultural traditions, or historic trends important at a local, regional, or national level. To be considered in association with a cultural resource, events must be important within the particular context being assessed.
- Criterion B: association with the lives of persons significant in our past. People considered may be important locally, regionally, or nationally, and the cultural resources considered are limited to properties illustrating a person's achievements rather than commemorating them.
- Criterion C: embodiment of the distinctive characteristics of a type, period, or method of construction; representative of the work of a master; possessing high artistic values; or representative of a significant and distinguishable entity whose components may lack individual distinction. Cultural resources considered generally include architectural resources such as buildings, objects, districts, and designed landscapes.
- Criterion D: cultural resources that have yielded, or may be likely to yield, information important in prehistory or history. Considered cultural resources typically include archaeological sites but may also include buildings, structures, and objects if they are the principal source of important information not contained elsewhere.

Cultural resources that are listed or considered eligible for listing in the NRHP are called "historic properties." Federal agencies are required by the NHPA to consider the possible effects of their undertakings on historic properties and take measures to avoid, minimize, or mitigate any adverse effects. NEPA requires federal agencies to consider how their undertakings may affect the quality of the human environment, including both cultural resources and those defined as historic properties, so that the nation may "preserve important historic, cultural, and natural aspects of our national heritage." "Undertaking" includes any project, activity, or program that has the potential to affect a historic property and that is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency.

Considering an undertaking's possible effects on historic properties is accomplished through a four-step review process outlined in Section 106 of the NHPA (36 CFR § 800). These steps are:

1. Initiation (defining the undertaking and the area of potential effect [APE] and identifying the parties to be consulted in the process),
2. Identification (studies to determine whether cultural resources are present in the APE and whether they qualify as historic properties),
3. Assessment of adverse effects (determining whether the undertaking would affect the qualities that make the property eligible for the NRHP), and

4. Resolution of any adverse effects (by avoidance, minimization, or mitigation).

A project may have effects on a historic property that are not adverse. However, if the agency determines that the undertaking's effect on a historic property within the APE would diminish any of the qualities that make the property eligible for the National Register (based on the criteria for evaluation at 36 CFR § 60.4), the effect is said to be adverse. Examples of adverse effects would be ground disturbing activity in an archaeological site or erecting tall buildings or structures within the viewshed of a historic building in such a way as to diminish the structure's integrity of feeling or setting and its ability to convey its historic and/or architectural significance. Adverse effects must be resolved. Resolution may consist of avoidance (such as redesigning a project to avoid impacts or choosing a project alternative that does not result in adverse effects), minimization (such as redesigning a project to lessen the effects or installing visual screenings), or mitigation. Adverse effects to archaeological sites are typically mitigated by means of excavation to recover the important scientific information contained within the site. Mitigation of adverse effects to historic buildings and structures sometimes involves thorough documentation of the resource by compiling historic records, studies, and photographs.

Agencies are required to consult with the appropriate SHPOs, federally recognized Indian tribes that have an interest in the undertaking, and any other party with a vested interest in the undertaking. Through various regulations and guidelines, federal agencies are encouraged to coordinate Section 106 and NEPA reviews to improve efficiency and allow for more informed decisions. Under NEPA, impacts to cultural resources that are part of the affected human environment but not necessarily eligible for the NRHP must also be considered. Generally, these considerations as well as those of NRHP-eligible traditional cultural resources (also called traditional cultural properties; see Parker and King 1998) are accomplished through consultation with parties having a vested interest in the undertaking, as described above.

**3.10.1.1 Identification Survey and Field Findings Summary**

TVA contracted with Tennessee Valley Archaeological Research (TVAR) to conduct a Phase I cultural resources survey of the Project Site (TVAR 2021a, 2021b). The area examined for archaeological sites and resources encompassed 2,295 acres, including the 1,459-acre disturbance footprint associated with the proposed solar PV facility. The area examined for architectural resources, referred to herein as the Viewshed, included the 1,459-acre disturbance footprint and the portions of a 0.5-mile radius surrounding the disturbance footprint that are visually connected by direct line-of-sight. Areas within the survey radius that were determined not to be within view of the Project due to terrain, vegetation, and/or modern built environments, are not considered part of the Viewshed.

Cultural resources identification consisted of background research and architectural and archaeological field surveys; the associated report provides preliminary NRHP evaluations and a results summary. During the archaeological survey, TVAR identified or revisited 63 archaeological sites (1LA714, 1LA981–1LA1042), 252 non-site cultural resources, and one unnamed cemetery. Non-site cultural resources are archaeological resources that do not traditionally receive a site number, including historic artifact scatters and/or structural remains that lack definitive evidence of association with a pre-1970 occupation, isolated finds of pre-contact and/or historic artifacts, and artifacts contained within disturbed/secondary contexts (trash dumps, push piles, fill material, displaced by natural or human activities). Sixteen of the archaeological sites and none of the non-site cultural resources are recommended eligible for listing on the NRHP. During the architectural



survey, TVAR revisited eight previously recorded architectural resources and newly recorded an additional 14 architectural resources. Four of the architectural resources are either listed on the NRHP or recommended eligible for listing on the NRHP. TVAR also conducted a metal detection survey at archaeological site 1LA1025 and recommended the establishment of WSRHD, inclusive of both historic archaeological and architectural resources, covering approximately 4,275 acres that encompasses and extends outside of the archaeological and architectural APEs (TVAR 2021a, 2021b).

### **3.10.1.2 Cultural Context**

Humans have inhabited northern Alabama more or less continuously for more than 13,000 years. This period began with small, highly mobile groups of people using large spear points and knives, who at least occasionally hunted large now-extinct mammals. Thousands of years of cultural change and adaptation were marked by the development of large stone tools for processing nuts and shellfish during the Archaic Period (10,000 to 3,000 years ago), followed by the adoption of pottery and the first beginnings of plant cultivation in the Woodland Period (3,000 to 1100 years ago), and the rise of large towns during the Mississippian period beginning circa about AD 900. The historic contact period in northern Alabama was largely populated by members of the Cherokee, Creek, Chickasaw, and Choctaw nations. Generally speaking, large pre-contact habitation sites are found on levees or terraces along rivers and tributaries, while specialized campsites tend to be found on older alluvial terraces and in the uplands where resources were gathered. Levees and river terraces in the Tennessee River that were once occupied by various groups have been inundated by Guntersville, Wheeler, and Wilson Reservoirs.

Lawrence County was created by an act of the Alabama Territorial Legislature on February 6, 1818, nearly one year before Alabama became a state. The county was created from former Chickasaw lands ceded to the U.S. in the Treaty of Fort Jackson in 1814, the Turkey Town Treaty of 1816 and as well as Cherokee land acquired in the Treaty of Chickasaw Council House in 1816. The forced removal of over 2,000 indigenous people occurred in 1836 on overland transportation routes through Lawrence County, as part of the Cherokee Trail of Tears. In the project area, the Tuscumbia, Courtland and Decatur Railroad was used by the Smith (March 9-10, 1837), Deas (July 11, 1838), and Whiteley (July 21, 1838) detachments to transport the Cherokee from Decatur to Tuscumbia Landing.

The earliest Euro-American settlers to the area came primarily from Georgia, Tennessee, and the Carolinas, with others later coming from Kentucky and Virginia (King et al. 2009). Most settlers in the interior of the county typically consisted of small landholders and relied on agricultural activities for subsistence. Large scale cotton production, encouraged by the rich soil along the Tennessee River, resulted in the rise of farms and plantations. The county's burgeoning population included enslaved Africans and African Americans. At one time, plantation properties were numerous in the corridor between Decatur and Tuscumbia, Alabama, including the Pond Spring Plantation that is immediately adjacent to the Project Site. Pond Spring was originally owned John P. Hickman and later purchased by Benjamin Sherrod and then General Joseph (Joe) Wheeler. Skirmishes throughout the Civil War in northern Alabama mainly related to control over the supply line provided by the Memphis and Charleston railroad, including near Pond Spring. The facilities at the Pond Spring Plantation served as a camp for both the Union and Confederate armies, though primary sources more often allude to the plantation being used as a Confederate camping location (Meeks and Anderson 2012).

Born in 1836 in Augusta, Georgia, Wheeler earned the rank of colonel in the Confederate army during the Civil War. He became the owner of Pond Spring when he married Daniella Jones Sherrod, whose father made a wedding gift of the 2,000-acre plantation. In addition to operating the plantation, Wheeler ran the Pond Spring Store, located in the front yard of Pond Spring Plantation. A community with a railroad depot developed around the Pond Spring Store, and both the community and depot were subsequently known as Wheeler Station or Wheeler. The railroad depot at Wheeler Station served as a regular stop and departure point for passengers and cargo. General stores like the Pond Spring Store sprang up across the South in the post-Reconstruction era and became a symbol of a newly emerging Southern economic system (Clark 1944). Over the decades, as large plantations replaced clustered slave swellings with more widespread tenant housing, farmers found themselves increasingly in need of small-town merchants and stores (Bull 1952). In rural areas, general stores played a central role in the community, providing an outlet for the acquisition of goods and services as well as a place for social gathering (Bull 1952; Clark 1944).

Because of Courtland's location in the northern portion of the county, where the majority of plantations once stood, many freed African Americans worked as tenant farmers in the surrounding area. In the community of Wheeler Station, as many as 200 tenant farms stood during the 1930s, operated by both white and African American tenants (Joseph et al. 2002). Beginning in the 1930s, TVA constructed a series of locks and dams on the Tennessee River, making electricity widely available and inexpensive. This caused a shift in Lawrence County's economy from agriculture and forestry to industry and manufacturing.

### **3.10.1.3 Known Cultural Resources**

Of the 63 newly recorded or revisited archaeological sites, 47 of the sites are recommended ineligible for the NRHP based on lack of integrity and having limited research value. TVA finds the 16 remaining sites potentially eligible for the NRHP or of undetermined eligibility. Five of these sites (1LA985, 1LA995, 1LA1008, 1LA1030, and 1LA1031) are associated with pre-contact occupations and are considered eligible under Criterion D for potentially yielding important information regarding the area's pre-contact history. Eight of the sites (1LA981, 1LA1002, 1LA1003, 1LA1016, 1LA1022, 1LA1035, 1LA1036, and 1LA1037) are associated with historic occupations and are considered eligible under Criterion D for potentially yielding important information regarding the local historic period. Sites 1LA898 and 1LA990 represent several homesteads and farmsteads associated with the former community of Wheeler Station, discussed in Section 3.10.1.2. TVA considers these two sites eligible under Criterion D for potentially yielding important information regarding local and regional history of rural lifeways during the late 1800s and early 1900s in northern Alabama under Criterion D. Site 1LA989 may also be eligible due to having a significant pre-contact component. Historic site 1LA998 is considered eligible for the NRHP under Criterion D for potentially yielding important information regarding local and regional history of rural lifeways in northern Alabama.

TVAR also identified three locations that are potentially sensitive cultural resource areas with undetermined NRHP status. The sites consist of one unnamed cemetery located a short distance north of US 72A; a section of bluff line containing several rock shelters; and one locally reported earthen mound. Surface inspection of the agricultural field surrounding the potential mound and shovel testing in the immediate vicinity of the mound did not produce any artifacts. Based on these findings, coupled with a review of historical to current aerial photography, TVAR concluded that the mound is likely a pre-1992 push pile resulting from historical or modern human activities. TVAR recommended avoidance of this

undetermined cultural resource unless additional testing is conducted to better ascertain the cultural feature's age and function.

Background research for architectural resources identified 24 previously recorded architectural properties as potentially occurring within the Viewshed. Ten of these were to be no longer extant, and six properties were determined to be located outside of the Viewshed. Of the remaining eight, TVA determined that five are ineligible for listing on the NRHP. Two of the properties are listed on the NRHP, and the remaining architectural resource is recommended eligible for the NRHP (Figure 3-14).

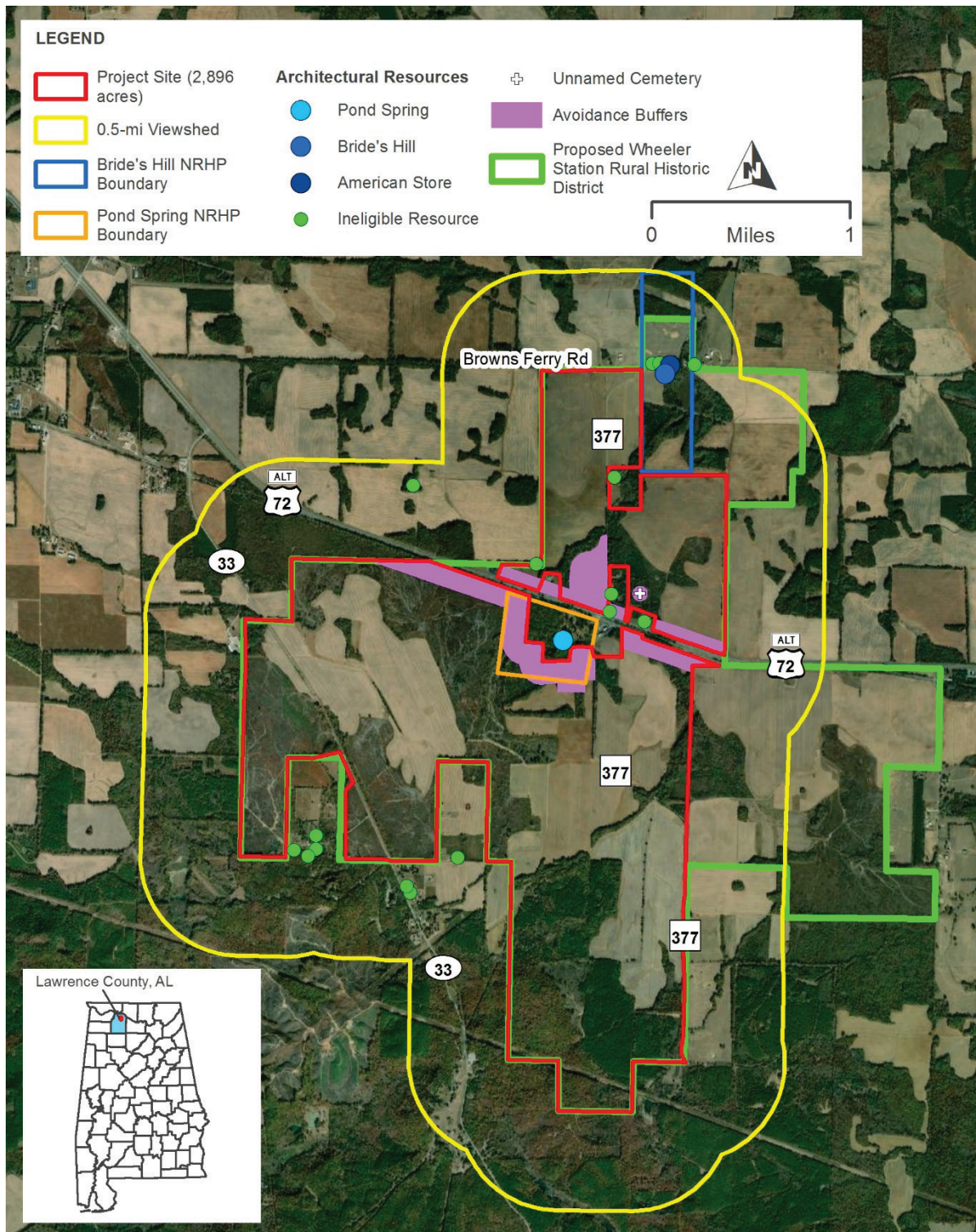


Figure 3-14. Architectural resources in the vicinity of the Project Site

Pond Spring, the General Joe Wheeler Home and associated property, is listed in the NRHP under Criterion B for its association with General Joe Wheeler and discussed in more detail in Section 3.10.1.2. Bride's Hill is included on the NRHP as part of a thematic listing of Tidewater Cottages within the Tennessee Valley under Criterion C for their architectural significance. Tidewater cottages reflect a residential architectural style that was common in coastal Virginia and are typically rectangular side-gable roof houses that sometimes feature dormers. The thematic listing indicates that Bride's Hill is additionally eligible under Criteria A and B for its significance in the areas of exploration and early settlement, as associated with its early owner, Robert H. Dandridge. The structural integrity of Bride's Hill has diminished over time. Most of the associated acreage has long ceased cultivation, with large portions of the southern boundary presently wooded. However, the house continues to convey its architectural and historical significance. The American Store, located near Bride's Hill, is an early example of a rural community store. The specific design of the extant "American" sign indicates that the store also once served as a filling station before American Oil was purchased by Standard Oil in the mid-1920s. The property retains a high degree of integrity and displays the aesthetic of an early rural store with its front-gabled design and wood exterior. TVA determined the American Store eligible for listing in the NRHP under Criterion A for its local significance and association with commerce.

The architectural survey also documented 14 newly recorded properties. Thirteen of these properties are recommended ineligible for the NRHP due to lack of architectural distinction or loss of integrity resulting from modern alterations or damage. TVA finds one of these properties, a segment of the former Tuscumbia, Courtland, and Decatur Railroad, eligible for the NRHP under Criterion A for its association with the Cherokee Trail of Tears. Specifically, this railroad segment is associated with the routes of the Deas (June 11, 1838) and Whiteley (July 21, 1838) detachments, which used the railroad to transport the Cherokee from Decatur to Tuscumbia Landing. The segment is part of the Trail of Tears National Historic Trail managed by the National Park Service.

TVAR conducted additional archival documentation to examine the potential for a rural historic district within the APE and recommended the establishment of WSRHD with a period of significance of 1818 to 1955 (TVAR 2021a, 2021b). TVAR determined that the Cherokee Trail of Tears is a contributing resource to this potential NRHP district. Three historic properties located within the architectural survey area and likely dating to a similar period as the Cherokee Trail of Tears also potentially contribute to this potential NRHP district: Pond Springs Plantation, Bride's Hill, and Byrd Log House, the latter being one of the individually ineligible properties. As discussed above, Pond Spring and Bride's Hill are NRHP-listed properties. Bride's Hill is additionally an Alabama Register of Landmarks and History-listed property, as is Byrd Log House. All three properties are associated with the initial development of the plantation landscape in Lawrence County between 1820 and 1840.

WSRHD, inclusive of both historical archaeological and architectural resources, encompasses approximately 4,275 acres that occur both within the APE and Viewshed and outside these areas. The period of significance (1818 to 1955) reflects the continuous agricultural use of the property for 137 years. WSRHD is recommended eligible for the NRHP under Criteria A, B, C, and D. Pond Spring and Bride's Hill are associated with the initial development of the plantation era landscape in Lawrence County between 1820 and 1840. Areas of WSRHD appear to retain vestiges of the rural historic landscape that first developed between 1820 and 1840 and continued into the 1950s, including open



agricultural fields and tree lines along property boundaries. Although most of the original built environment (i.e., buildings and structures) associated with the development of WSRHD has been effectively removed or significantly altered by post-1955 cultural processes, the agricultural fields have remained largely intact since the 1930s, and likely since the 1818-to-1865 plantation era.

TVAR's metal detection survey at archaeological site 1LA1025 encompassed 2.88 acres and resulted in 45 positive hits producing metal artifacts, the bulk of which were associated with middle/late twentieth century land use of the area. Four additional cannon shell fragments were recovered from the site. Based on this additional fieldwork, TVA maintains that the investigated portion of site 1LA1025 within the APE lacks integrity.

The boundary of the previously recorded site 1LA1051 was recorded as extending into the APE. TVA contracted with TVAR to conduct a Phase I archeological resources survey of the APE (TVAR 2021c). During the current survey, TVAR revisited the previously recorded archaeological site 1LA951 and identified two archaeological sites (1LA1051 and 1LA1052) and seven isolated finds. TVAR was not able to relocate site 1LA951, previously recommended ineligible. Site 1LA1051, characterized by a single piece of chert debitage and a small quantity of historic artifacts near a documented location, two non-extant structures, and 1LA1052, a historic artifact scatter, within the survey area lack integrity and research potential.

### **3.10.2 Environmental Consequences**

This section describes the potential impacts to cultural resources should the Proposed Action or No Action Alternative be implemented.

#### **3.10.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts on cultural resources would result.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities, including the continuation of current agricultural operations, would not affect cultural resources. The potential future development and/or disposal of the site could affect cultural resources, although TVA's compliance with NHPA when determining the future of the site would minimize any adverse effects. The establishment of WSRHD would also likely increase community support for preserving the area's historic resources.

#### **3.10.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period. The effects of these actions on cultural resources are described below.

Project components on portions of the Project Site directly north and south of US 72A from the property would introduce a visual effect to Pond Spring, the General Joe Wheeler Home and associated property. The setting of this portion of the property's viewshed has been impacted by multiple modern buildings and other facilities, including an office, warehouse,



and storage facilities, associated with a private railroad-related operation, as well as numerous modern structures, including houses, large outbuildings, and a tennis court. TVAR recommended that the development of the portion of the Project Site within view, generally to the southeast of the property (Photo 3-17), would have a visual effect on the unique nineteenth century-built environment associated with the plantation. The Project components would not be physically located within the property's NRHP boundary; thus, the Project would not result in direct impacts within the NRHP boundary. Based on this recommendation, TVA designed the Project to allow a minimum 600-foot setback that is primarily forested between Pond Spring and the Project components. Overall, TVA finds that the Project would introduce a visual effect to Pond Spring, but the effect would not be adverse. The Project would not compromise the physical integrity of the property or diminish the architectural or historical significance for which it is NRHP-listed.

The Project viewshed encompasses both the cottage and the NRHP property boundary associated with Bride's Hill. However, the historic setting of the property has been compromised by various aboveground intrusions constructed outside the property's period of significance, including two barns within the property's NRHP boundary, multiple nearby single-family dwellings, and several aboveground utilities in the area. Additionally, the Project would not be physically located within the property's current NRHP boundary. Therefore, TVA finds that the Project would introduce a visual effect to Bride's Hill, generally to the southwest of the property (Photo 3-16), but the effect would not be adverse. The Project would not compromise the physical integrity of the property or diminish the architectural or historical significance for which it is NRHP-listed.

Based on TVAR's in-field assessment, the Project would introduce a visual effect to the American Store, generally to the southwest of this resource (Photo 3-16). However, the historic setting of the property has been compromised due to the proximity of multiple single-family dwellings and several aboveground utilities constructed outside the property's period of significance. Furthermore, the Project would avoid this resource by an approximately 500-foot setback; thus, the Project would not result in direct alteration of the property. For these reasons, TVA finds that the Project would introduce a visual effect to the American Store, but the effect will not be adverse. The Project would not compromise the physical integrity of the property or diminish the historical significance for which it is recommended eligible for the NRHP.

The Project would introduce a visual effect to the railroad segment associated with the Deas and Whiteley detachments of the Cherokee Trail of Tears, generally to the north of this resource at the northeastern corner of the southern portion of the Project Site (Photo 3-14). However, as shown in Photo 3-15, only a small portion of the resource will be visible from the solar arrays and the historic setting of the property has already been compromised at various locations along the proposed NRHP boundary by modern development, including expansion of US 72A, the presence of a TL corridor, and several modern buildings. Furthermore, the Project would not be physically located within the property's proposed NRHP boundary and, thus, would not result in direct alteration of the railroad alignment. For these reasons, TVA finds that the Project would introduce a visual effect to the original alignment associated with the Tuscumbia, Courtland, and Decatur Railroad, but the effect would not be adverse. The Project would not compromise the physical integrity of the property or diminish the historical significance for which it is recommended eligible for the NRHP.

Overall, TVA has designed the Project to avoid adverse effects or impacts to listed, eligible, undetermined, or potentially sensitive cultural resources. TVA would avoid all 16 archaeological sites determined eligible for listing on NRHP and the unnamed cemetery with at least a 100-foot buffer. TVA would also avoid the bluff line and the potential mound due to their undetermined eligibility status. The Project would have visual effects to three listed or eligible architectural resources; however, the effects would not be adverse due to modern intrusions and/or setbacks from the resources that would be maintained by the Project.

Based on TVAR's analysis, 82 percent of the disturbance footprint (1,459 acres) of the planned solar facility is located within acreage associated with the rural historic landscape that is a character-defining feature of WSRHD. The disturbance footprint would physically alter the character of WSRHD and would introduce new elements to the historically rural landscape including PV arrays, a substation, a BESS, gravel access roads, and chain-link fencing. These developments would alter the visual integrity of WSRHD, as well as viewsheds and views within the district, by adding physical elements to the landscape that are not in keeping with the character of the rural historic landscape, mainly as related to the arrangement of agricultural fields.

The effects of the proposed action on ambient noise levels and traffic are described in Section 3.8 and 3.14. While noise related to pile driving may be perceptible within portions of WSRHD, the noise would be temporary and would not alter characteristics that qualify the district, or its contributing elements, for the NRHP. While there may be a slight increase in traffic during the construction (approximately 24 to 36 months), overall, this slight increase would be temporary and would not result in any long-term effects on the integrity of WSRHD. The construction traffic would generally not interfere with visitor or periodic event traffic associated with Pond Spring. The property is directly accessed from US 72A, and construction access to the Project Site would be available from multiple directions and a variety of roads. TVA conducted a pre-construction traffic study to ensure that the activities related to the construction of the undertaking would not disrupt normal traffic patterns in the area (HDR 2022). In coordination with ALDOT, it was determined that no road improvements or other mitigation measures were necessary in relation to the Project. If disruption becomes an issue due to the Project, TVA would implement mitigation measures to address these traffic flow issues.

Potential post-construction effects related to the operation and maintenance of the solar facility would include the introduction of some lighting. Both the substation and BESS would have permanent lighting to facilitate night access. The lights would be fully shielded or would have internal low-glare optics, such that no light is emitted from the fixtures at angles above the horizontal plane, to minimize impacts to surrounding areas. In addition, to minimize or eliminate effects from glare and reflection associated with the operation of the solar arrays, TVA would install anti-reflective PV panels.

Although TVA modified the undertaking in order to avoid or minimize effects to individual contributing historic properties, the proposed undertaking would alter the historic characteristics that qualify the proposed rural landscape district for the NRHP by diminishing its integrity of design, setting, materials, workmanship, feeling, and association. Thus, the undertaking, as currently planned, would cause an adverse effect on WSRHD.

TL upgrades associated with the Project would require access road improvements, pole replacements, and OPGW installation. A helicopter would be visible and introduce

temporarily heightened noise to the setting of nearby historic properties during the two-week installation of OPGW, if this method is determined most feasible.

The Proposed Action would not pose an adverse effect to the identified portions of 1LA1051 or 1LA1052 within the area of proposed disturbance.

Under Section 106 of the NRHP, TVA has consulted with AHC and federally recognized Indian tribes regarding TVA's NRHP eligibility determinations, findings of effect, and to develop avoidance and minimization efforts. TVA and the consulting parties concur that the Project would have an adverse effect on WSRHD. TVA and AHC have developed and executed an MOA pertaining to Project effects to WSRHD. These measures consist of:

- Producing two copies of a traveling exhibit consisting of three to five retractable displays on African-American life in late nineteenth to mid-twentieth century Lawrence County and WSRHD; one copy would be delivered to AHC, while the other copy would be used for future TVA public events within the region,
- Constructing a wooden fence along the eastern boundary of NRHP-listed Pond Spring to match the existing fencing along the north edge of the property and in keeping with the historical documented fencing, and
- Preparing updated NRHP nomination forms for Pond Spring and Bride's Hill and submitting them to AHC within one year of the full execution of the MOA.

### **3.11 Utilities**

This section describes an overview of existing utilities within the project area and the potential impacts on these utilities that would be associated with the No Action and Proposed Action alternatives. Existing conditions for utilities are presented for the vicinity of the Project Site, where concentrated Project effects to this resource area could occur. Project effects are also assessed for the TL upgrade activities. Specific utility components analyzed below include telecommunications, electricity, natural gas, water, and sewer.

#### **3.11.1 Affected Environment**

The Project Site is located in a rural, unincorporated area in northern Lawrence County, approximately two miles east of the town of Courtland. The TL upgrade locations extend east-southeast from the Project Site, crossing rural, unincorporated portions of Lawrence County, in the vicinity of the city of Decatur.

##### **3.11.1.1 Telecommunications**

In addition to various mobile providers, telecommunication services in the Project Site vicinity are provided by AT&T and Sardis Telecom (AT&T 2020; Sardis Telecom 2020).

##### **3.11.1.2 Electricity**

In the Project Site vicinity, electrical service is provided by Joe Wheeler Electric Membership Cooperative (JWEMC), which distributes power provided by TVA (JWEMC 2020). Existing power lines are present in the project area along US 72A, SR 33, and other major and minor roads in the vicinity. Two transmission line ROWs extend through the southern portion of the Project Site. TVA's Reservation–Mountain Home 161-kV TL crosses the southern portion of the Project Site in a northwest-southeast orientation. TVA's Browns Ferry NP–West Point 500-kV TL crosses the southeastern portion of the Project Site in a southwest-northeast orientation.

### **3.11.1.3 Natural Gas**

Natural gas is distributed by the North Alabama Gas District. Given their proximity to Courtland, the residences located adjacent to the Project Site may have natural gas service (North Alabama Gas District 2020).

### **3.11.1.4 Water and Sewer**

Due to being predominantly outside of incorporated municipality limits, water service in the Project Site vicinity is provided either by the West Morgan – East Lawrence Water and Sewer Authority (WMEL) or private wells and septic systems (West Morgan – East Lawrence Water and Sewer Authority 2020). Given their respective proximity to Courtland, the residences located adjacent to the southern and northern portions of the Project Site may have water service from WMEL.

## **3.11.2 Environmental Consequences**

This section describes the potential impacts to utilities should the Proposed Action or No Action Alternatives be implemented.

### **3.11.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts to utilities would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations and/or implement environmental enhancement measures for the state-listed Tuscumbia darter and the globally rare round-rib elimia. These activities would not affect local utilities. On-site utilities would likely remain unchanged, with the exception of potential upgrades and maintenance. TVA's interim activities on the site would follow TVA's standard BMPs and permitting requirements to minimize the potential for adverse impacts to utility services. The potential future development and/or disposal of the site could affect utility services by causing relocations and increased demand for the services.

### **3.11.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Modifications to existing utilities would occur with implementation of the Proposed Action Alternative. This would include installation of approximately eight miles of OPGW and reconductoring on Reservation–Mountain Home 161-kV TL between Structure 247 and the Mountain Home 161-kV Substation. Electrical service to the North Alabama Utility-Scale Solar Facility would be provided by JWEMC, and JWEMC would coordinate with customers if outages were necessary. The Project would obtain water by connection to a municipal source or by delivery via water trucks. Thus, water service for the Project may be obtained through WMEL.

Due to the Project-related TL upgrades, there may be short-term adverse impacts to local utilities such as electricity connections when conducting the TL upgrades or bringing the

solar PV facility on-line or during routine maintenance of the facility. No long-term adverse impacts are expected to be associated with the Project. Implementation of the Proposed Action would result in additional renewable energy resources in the region and would, thus, constitute a beneficial impact to electrical services across the region.

### **3.12 Waste Management**

This section describes an overview of existing waste management within the project area and the potential impacts to waste management that would be associated with the No Action and Proposed Action alternatives. Existing conditions for waste management are presented for the vicinity of the Project Site, where concentrated Project effects to this resource area could occur. Project effects were also considered for the TL upgrade activities. Components of waste management that are analyzed include solid and hazardous waste and materials.

#### **3.12.1 Affected Environment**

“Hazardous materials” and “hazardous wastes” are substances which, because of their quantity, concentration, or characteristics (physical, chemical, or infectious), may present a significant danger to public health and/or the environment if released. These substances are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; 42 U.S.C. §§ 9601 et seq.) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA; 42 U.S.C. §§ 6901 et seq.). Regulated hazardous wastes under RCRA include any solid, liquid, contained gaseous, or semisolid waste or combination of wastes that exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or is listed as a hazardous waste under 40 CFR § 261. Storage and use of hazardous materials and wastes are regulated by local, state, and federal statutes including the Emergency Planning and Community Right-to-Know Act (42 U.S.C. §§ 116 et seq.) and RCRA.

Available historical topographic quadrangles document that land use in the project area has remained relatively unchanged at least since the mid-1930s but likely earlier, based on historical trends (USGS 1936). Throughout this time, land uses in the project area have been primarily agricultural and rural-residential.

Collection and disposal of solid waste outside of incorporated municipalities in Lawrence County is conducted by private trash collecting companies. The closest landfill to the Project Site is Morris Farms Landfill, operated by Republic Services and located about six miles north of the Project Site. Morris Farms Landfill accepts non-hazardous waste only. Various vendors offer hazardous waste removal.

#### **3.12.2 Environmental Consequences**

This section describes the potential impacts to waste management should the No Action or Proposed Action alternative be implemented.

##### **3.12.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related waste would be generated, and no impacts to waste management resources from the Project would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of

parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would not change current waste management practices. The potential future development and/or disposal of the site would likely affect waste management; the magnitude of this affect cannot be predicted at this time.

### **3.12.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period. Storage and use of liquid materials in the form of petroleum-based oils and fuels, and generation of liquid and solid wastes in the form of used oil, construction debris, packing materials, and general construction waste would occur. As described below, TVA and the facility operator would implement appropriate measures throughout the construction and operation of the Project to properly manage wastes. Consequently, the Proposed Action would not result in adverse effects from waste management.

#### **3.12.2.2.1 Materials Management**

During construction of the proposed solar facility, substation, and BESS, materials would be stored on site in storage tanks, vessels, or other appropriate containers specifically designed for the characteristics of these materials. The storage facilities would include secondary containment in case of tank or vessel failure. Construction- and decommissioning-related materials stored on site would primarily be liquids such as used oil, diesel fuel, gasoline, hydraulic fluid, and other lubricants associated with construction equipment. Safety Data Sheets for all applicable materials present on site would be made readily available to on-site personnel.

Fueling of some construction vehicles would occur in the construction area. Other mobile equipment would return to the on-site laydown areas for refueling. Special procedures would be identified to minimize the potential for fuel spills, and spill control kits would be carried on all refueling vehicles for activities such as refueling, vehicle or equipment maintenance procedures, waste removal, and tank clean-out. Fuel tanks and equipment may be stored on-site for approximately 24 to 36 months during construction of the Project. The total aggregate aboveground oil storage capacity would exceed 1,320 gallons, the threshold above which a Spill Prevention, Countermeasure and Control (SPCC) plan is required (40 CFR part 112). Since no individual aboveground oil storage container has a capacity greater than 5,000 gallons, this facility meets the criteria for a Tier I qualified facility under USEPA's SPCC regulation; however, all bulk oil storage containers with a capacity of 55 gallons and/or more will be provided with secondary containment. The Project will adhere to the existing SPCC Plan for Transmission & Power Supply applicable to new construction projects.

During operations, any bulk chemicals or petroleum products would be stored in storage tanks or designated chemical storage area. Chemical storage areas would be designed to contain leaks and spills. The transport, storage, handling, and use of chemicals would be conducted in accordance with applicable laws, ordinances, regulations, and standards. Various transformers would contain oil. The quantities of these materials stored on site would be evaluated to identify the required usage and to maintain sufficient inventories to meet use rates without stockpiling excess chemicals.

In addition to the chemicals listed above, small quantities (less than 55 gallons, 500 pounds or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint,



degreasers, herbicides, other pesticides, air conditioning fluids (chlorofluorocarbons), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the facility. Flammable materials (e.g., paints, solvents) would be stored in flammable material storage cabinet(s). Due to the small quantities involved and the controlled environment, a spill could be cleaned up without significant environmental consequences.

The facility operator would develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials (e.g., Hazardous Material Business Plan). Facility personnel would be supplied with appropriate personal protective equipment (PPE) and would be properly trained in the use of PPE as well as the handling, use, and cleanup of hazardous materials used at the facility and the procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials would be stored on site.

### 3.12.2.2 Waste Management

Construction of the Proposed Action is estimated to result in the generation of approximately 48,640 cubic yards of solid waste (an estimated 1,216 loads at 40 cubic yards each), consisting of construction debris and general trash, including pallets and flattened cardboard module boxes. TVA estimates that approximately 3,500 flatbed truck loads would be required for hauling equipment and removing waste during construction.

Information on wastes anticipated to be generated during Project construction is provided in Table 3-11.

**Table 3-11. Summary of construction waste streams and management methods**

<b>Waste stream</b>	<b>Origin and composition</b>	<b>Estimated frequency of generation</b>	<b>On-site treatment</b>	<b>Waste management method/offsite treatment</b>
<b>Construction waste</b>	Empty material containers	Intermittent	None	Return to vendor
<b>Construction waste</b>	Used oil, hydraulic fluid, oily rags	Intermittent	None	Recycle, remove to offsite disposal location
<b>Construction waste</b>	Steel, glass, plastic, wood/pallets, cardboard, paper	Intermittent	None	Recycle wherever possible, otherwise dispose to Class I landfill
<b>Sanitary waste</b>	Portable chemical toilets – sanitary waste	Periodically pumped to tanker truck by licensed contractors	None	Ship to sanitary wastewater treatment plant

The anticipated quantities of waste produced during Project operation are summarized in Table 3-12. Solid wastes and unusable materials produced as a result of implementation of the Proposed Action would be handled, stored, and managed in accordance with Alabama Universal Waste requirements.

**Table 3-12. Summary of operation waste streams and management methods**

Waste stream and classification	Origin and composition	Estimated amount	Estimated frequency of generation	Waste management method	
				On-site	Off-site
<b>Used hydraulic fluid, oils and grease-petroleum-related wastes</b>	Tracker drives, hydraulic equipment	1,000 gallons/year	Intermittent	Accumulate on site	Recycle
<b>Oily rags, oil absorbent, and oil filters-petroleum-related wastes</b>	Various	One 55-gallon drum/month	Intermittent	Accumulate on site	Sent off site for recovery or disposed at Class I landfill
<b>Spent batteries</b>	Lead acid/lithium ion	1,000	Every 10 to 15 years	Accumulate on-site	Recycle

If the BESS is installed as part of the Project, the prevention of leaks would be handled on site through appropriate containment and spill prevention measures. Other wastes, including batteries that are replaced during facility operation or when the system is decommissioned, will be disposed of offsite and/or recycled in accordance with manufacturer recommendations and appropriate regulations and industry BMPs.

Waste collection and disposal would be conducted in accordance with applicable regulatory requirements to minimize health and safety effects. To the extent possible, waste will be recycled. Materials that cannot be recycled would be disposed of at an approved facility to be determined by the designated contractor(s) in accordance with applicable federal, state, and local laws and regulations. No waste oil would be disposed of on the Project Site.

If necessary, TVA or the construction contractor would obtain a hazardous waste generator identification number from USEPA and the State of Alabama prior to generating any hazardous waste.

During construction, TVA, through designated contractor and subcontractor personnel, would be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced. Disposal containers such as dumpsters or roll-off containers would be obtained from a proper waste disposal contractor. Records of the amounts generated would be provided to the designated North Alabama Utility-Scale Solar Facility environmental specialist.

### **3.12.2.2.3 Wastewater**

The Project would not install groundwater wells, septic systems, or water treatment facilities. Other wastewater potentially generated during construction or operations may include domestic sewage and wastewater from non-detergent equipment washing and dust control. Portable toilets or other temporary facilities would be used for the construction workforce. Water used for equipment washing and dust control would be handled in accordance with BMPs described in the Project stormwater/BMP plan. If an additive is required to help facilitate the cleaning process, then the wastewater stream or the waste

product would need to be evaluated to ensure it is properly disposed of according to applicable federal, state and local regulations. With application of these BMPs, no adverse effects would be anticipated from wastewater generated during the Project.

### **3.13 Public Health and Safety**

This section describes an overview of existing public health and safety at the Project Site and the potential impacts to public health and safety associated with the No Action and Proposed Action alternatives. Existing conditions for health and safety are presented for the vicinity of the Project Site, where concentrated Project effects to this resource area could occur. Project effects were also considered for the TL upgrade activities. Analyzed issues include emergency response and preparedness and occupational (i.e., worker) safety in compliance with OSHA standards.

#### **3.13.1 Affected Environment**

The Project Site is currently private property, and agricultural and forested land uses dominate. Public emergency services in the area include urgent care clinics, hospitals, law enforcement services, and fire protection services. The Alabama Emergency Management Agency has the responsibility and authority to coordinate with state and local agencies in the event of a release of hazardous materials.

The Lawrence Medical Center, located in Moulton, Alabama, approximately 16 miles (23 minutes) south of the Project Site, is the closest medical provider to the Project Site.

Law enforcement services in the town of Courtland are provided by the Courtland Police Department. Lawrence County law enforcement services are provided by the Lawrence County Sheriff's Office in Moulton, approximately 15 miles (18 minutes) from the Project Site. The Courtland Police Department is located in Courtland, approximately two miles (five minutes) from the Project Site.

Fire protection services are provided by the Courtland Fire and Rescue and the Hillsboro Area Volunteer Fire Department, located approximately two miles (five minutes) and 10 miles (15 minutes), respectively, from the Project Site.

#### **3.13.2 Environmental Consequences**

This section describes the potential impacts to public and occupational health and safety should the No Action or Proposed Action alternative be implemented.

##### **3.13.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts on public health and safety would result.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would not affect public health and safety. With adherence to applicable regulations, the potential future development and/or disposal of the site is unlikely to adversely affect public health and safety.

### **3.13.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

During construction, workers would have an increased safety risk. However, because construction work has known hazards, the standard practice is for contractors to establish and maintain health and safety plans in compliance with OSHA regulations. Health and safety plans emphasize BMPs for site safety management to minimize potential risks to workers. Examples of BMPs include employee safety orientations; establishment of work procedures and programs for site activities; use of equipment guards, emergency shutdown procedures, lockout procedures, site housekeeping, and personal protective equipment; regular safety inspections; and plans and procedures to identify and resolve hazards.

Potential public health and safety hazards could result from increased traffic on roadways due to construction of the Project. Residential and other human use areas along roadways used by construction traffic to access the Project Site or TL upgrade locations would experience increased commercial and industrial traffic. Awareness of these residences and establishment of traffic procedures to minimize potential safety concerns would be addressed in the health and safety plans followed by construction contractor(s).

Approximately 2,500 gallons of fuel for vehicles would be kept on the Project Site in storage tanks during construction of the proposed solar facility. An SPCC plan would be implemented to minimize the potential of a spill and to instruct on-site workers on how to contain and clean up any potential spills. The perimeter of each grouping of Project elements would be securely fenced during construction and for the duration of operation, and access gates would normally remain locked. General public health and safety would not be at risk in the event of an accidental spill on site. Emergency response would be provided by the local, regional, and state law enforcement, fire, and emergency responders.

Public health and safety hazards could result from a fire during the construction of the BESS, if installed as part of the Project. If a fire were to occur, flammable and toxic gases could be released. Proper storage, handling and ventilation would be employed to reduce the risk of potential hazards.

During operation, solar PV systems generate electromagnetic fields (EMF). However, according to a study published by North Carolina State University (2017), solar PV technologies and solar inverters do not pose significant human health risks. EMF produced by electricity has enough energy to produce heat but not enough to remove electrons from a molecule or damage DNA. Distance from the EMF source, such as provided by the solar panel setbacks and security fencing proposed to surround separate portions of the Project, renders the exposure to EMF insignificant and, therefore, not harmful to human health. The strength of the EMF present at the perimeter of a solar facility within a building is substantially lower than the typical exposures to EMF from household sources such as refrigerators and microwave ovens (see Appendix B and NIOSH 2014 for more information).

Overall, impacts to public health and safety in association with implementation of the Proposed Action would be considered temporary and minor.

### **3.14 Transportation**

This section describes an overview of existing transportation resources, and the potential impacts on transportation resources that would be associated with the No Action and Proposed Action alternatives. Existing conditions for transportation resources are presented for the vicinity of the Project Site, where concentrated Project effects to transportation could occur. Project effects were also considered for the TL upgrade activities. Components of transportation resources that are analyzed include roads, traffic, railroads, and airports.

#### **3.14.1 Affected Environment**

##### **3.14.1.1 Roads**

The Project Site is bisected by east-west-oriented US 72A. US 72A in the project area is an alternate route from the main US 72 to the north and is a four-lane divided federal highway connecting the midsized cities of Muscle Shoals and Decatur, Alabama. SR 33 crosses the western portion of the Project Site and is a two-lane, paved state road that is oriented north-south between Double Springs, Alabama, and Courtland. One small local road, CR 377, traverses north-south through the central portion of the Project Site. CR 387, also called Browns Ferry Road, is a two-lane, paved public road that extends east-west along the northern boundary of the Project Site and provides access to the Project Site through its connection with CR 377. There are also a few unnamed private dirt roads that extend through the Project Site.

##### **3.14.1.2 Road Traffic**

Existing traffic volumes on some of the roads in the project area were determined using 2019 Average Annual Daily Traffic (AADT) counts measured at existing ALDOT stations (ALDOT 2020b). Three ALDOT stations (Stations 514, 545, and 546) are located on or near the Project Site. Station 514 is located on SR 33, where the road extends within the Project Site. The 2019 AADT count for Station 514 was 1,219. Stations 545 and 546 are located on US 72A, a half mile to the west and one mile to the east of the Project Site, respectively. The 2019 AADT count was 10,834 vehicles for Station 545 and 12,082 vehicles for Station 546. As measured in August 2019, Stations 545 and 546 had peak volumes in the morning hours between 6 and 7 AM, and most (over 50 percent) of the vehicles traveling US 72A during the overall period of observation were in the westbound lane, heading toward Courtland. Station 514 had a peak volume in the afternoon hours between 4 and 5 PM, and most (over 50 percent) of the vehicles on the roadway during the overall period of observation were in the northbound lane, heading toward US 72A.

##### **3.14.1.3 Rail and Air Traffic**

A rail line operated by Norfolk Southern crosses the Project Site, paralleling US 72A. Courtland Airport is located approximately three miles west of the Project Site. The closest regional airport is the Northwest Alabama Regional Airport in Muscle Shoals, located approximately 20 miles west of the Project Site. The closest major airport, and the only one in the vicinity with regular commercial passenger service, is the Huntsville International Airport in Huntsville, Alabama, approximately 90 miles east of the Project Site.

#### **3.14.2 Environmental Consequences**

This section describes the potential impacts to transportation resources should the No Action or Proposed Action alternative be implemented.

#### **3.14.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no Project-related impacts on transportation resources would result.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These actions would not affect transportation, including local traffic volumes. The potential future development and/or disposal of the site would likely affect transportation, although the magnitude of this effect is unknown at this time.

#### **3.14.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Given the distance from local, regional, and major airports, construction and operation of the proposed solar facility is not expected to have an effect on operation of airports in the region. However, per the Federal Aviation Administration (FAA) guidelines regarding solar facilities near airports (FAA 2018), TVA considered effects from the Project via the FAA Notice Criteria Tool (FAA 2022), which returned a finding of not exceeding notice criteria, therefore, not requiring the Project file FAA Form 7460-1. TVA requested that FAA review the Draft EIS during the public comment period due to the proximity of the Courtland Airport. The operation of the Project would not affect commercial air passenger or freight traffic in the region and would not adversely affect any aerial crop dusters operating in the vicinity of the Project Site.

During construction of the proposed solar facility, a crew of approximately 150 to 500 people would be present on the Project Site typically between sunrise and sunset, five to seven days a week. A majority of these workers would likely come from the local area or region. Other workers could come from outside the region, and if so, many would likely stay in hotels in the vicinity, the closest of which are approximately 18 miles to the east of the Project Site in Decatur. It is anticipated that workers would drive personal vehicles to the Project Site. Some of the individual workers and work teams would likely visit local restaurants and other businesses during the construction phase of the Project. Additional traffic due to deliveries and waste removal would consist of an average of three to seven vehicles per day during construction, as discussed in more detail below.

Traffic flow around the Project Site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. Deliveries and most workers would likely access the Project Site by SR 33 from the south or US 72A from the east or west. As no direct Project access road would be built from US 72A, SR 33 would likely be used to directly access the southern portion of the Project Site. CR 377, from US 72A or Brown's Ferry Road, would likely be used to directly access the northern portion of the Project Site. Several businesses and residences are present along Brown's Ferry Road, SR 33, and US 72A. The construction traffic would generally not interfere with visitor or periodic event traffic associated with Pond Spring, the General Joe Wheeler Home, as the home is directly accessed from US 72A, and Project access is available from multiple directions and a variety of roads. Therefore, traffic to the Project Site would be more dispersed. TVA



conducted a pre-construction traffic study to ensure that the Project activities would not disrupt normal traffic patterns in the project area (HDR 2022). In coordination with ALDOT, it was determined that no road improvements or other mitigation measures were necessary in relation to the Project. If disruption becomes an issue due to the Project, TVA would implement mitigation measures to address these traffic flow issues. These measures would minimize potential adverse impacts to traffic and transportation to negligible levels.

Construction equipment and material delivery and waste removal would require an average of three to seven flatbed semi-trailer trucks or other large vehicles visiting the Project Site each day during the construction period. The Project Site can be accessed via routes that do not have load restrictions. These vehicles should be easily accommodated by existing roadways; therefore, only minor impacts to transportation resources in the project area would be anticipated as a result of construction vehicle activity.

Several Project access roads would be maintained on the Project Site. Following construction, the compacted gravel roads would be maintained to allow access for inspection and maintenance activities. However, these roads would be closed to the public. Permanent access to the Project substation and the BESS would be from CR 377.

Due to the proximity of the Project Site to the town of Courtland, possible minor traffic impacts along US 72A, to the west of CR 33, could occur, as workers could commute from and through Courtland. However, the proposed workforce would consist of a maximum of 500 employees for only part of the construction period; therefore, the addition of these vehicles to the existing traffic on SR 33 and US 72A would be considered moderate temporary impacts. Implementation of mitigation measures to address traffic flow issues would minimize potential adverse impacts to traffic and transportation to minor or negligible levels.

During normal operations, the North Alabama Utility-Scale Solar Facility would not be staffed but would have occasional workers at the facility conducting periodic inspections and maintenance activities. The addition of vehicles for these workers on local roadways would be accommodated by existing infrastructure; therefore, the operation of the Project would not have a noticeable impact on the local roadways.

Overall, direct impacts to transportation resources associated with implementation of the Proposed Action are anticipated to be minor to moderate and minimized or mitigated. The Proposed Action would not result in any indirect impacts to transportation.

### **3.15 Socioeconomics**

This section describes an overview of existing socioeconomic conditions in the project area, and the potential impacts to socioeconomic conditions that would be associated with the No Action and Proposed Action alternatives. Existing conditions for socioeconomic resources are presented for the vicinity of the Project Site, where concentrated Project effects to socioeconomic resources could occur. Project effects were also considered for the TL upgrade activities. Components of socioeconomic resources that are presented include population, employment, and income.

#### **3.15.1 Affected Environment**

The proposed solar facility would be located entirely in an unincorporated portion of northern Lawrence County, Alabama. The Project Site overlaps U.S. Census Bureau (USCB) 2010 Census Tract (CT) 9791 and CT 9792 (Figure 3-15). Generally, 2010 CT

9791 encompasses northeastern portions of Lawrence County and includes the entire town of Hillsboro and portions of the unincorporated community of Wheeler, and 2010 CT 9792 encompasses northwestern portions of Lawrence County and includes the entire towns of Courtland, North Courtland, and Town Creek and portions of the unincorporated community of Wheeler. The portion of 2010 CT 9791 that overlaps the Project Site is approximately 2,385 acres, or five percent of 2010 CT 9791's total area, and the portion of 2010 CT 9792 that overlaps the Project Site is approximately 511 acres, or 0.6 percent of 2010 CT 9792's total area.

### 3.15.1.1 Population and Demographics

The population of Lawrence County, as reported in the 2020 USCB decennial census (2020 Census), was 33,073 (USCB 2022a). The Alabama State Data Center (2020) projects that the population of Lawrence County will decrease by approximately 9.1 percent by 2040. However, based on current trends, population decreases would likely concentrate in portions of the county outside the project area. Population trends for each associated CT, as compared with Lawrence County and the state, are presented in Table 3-13.

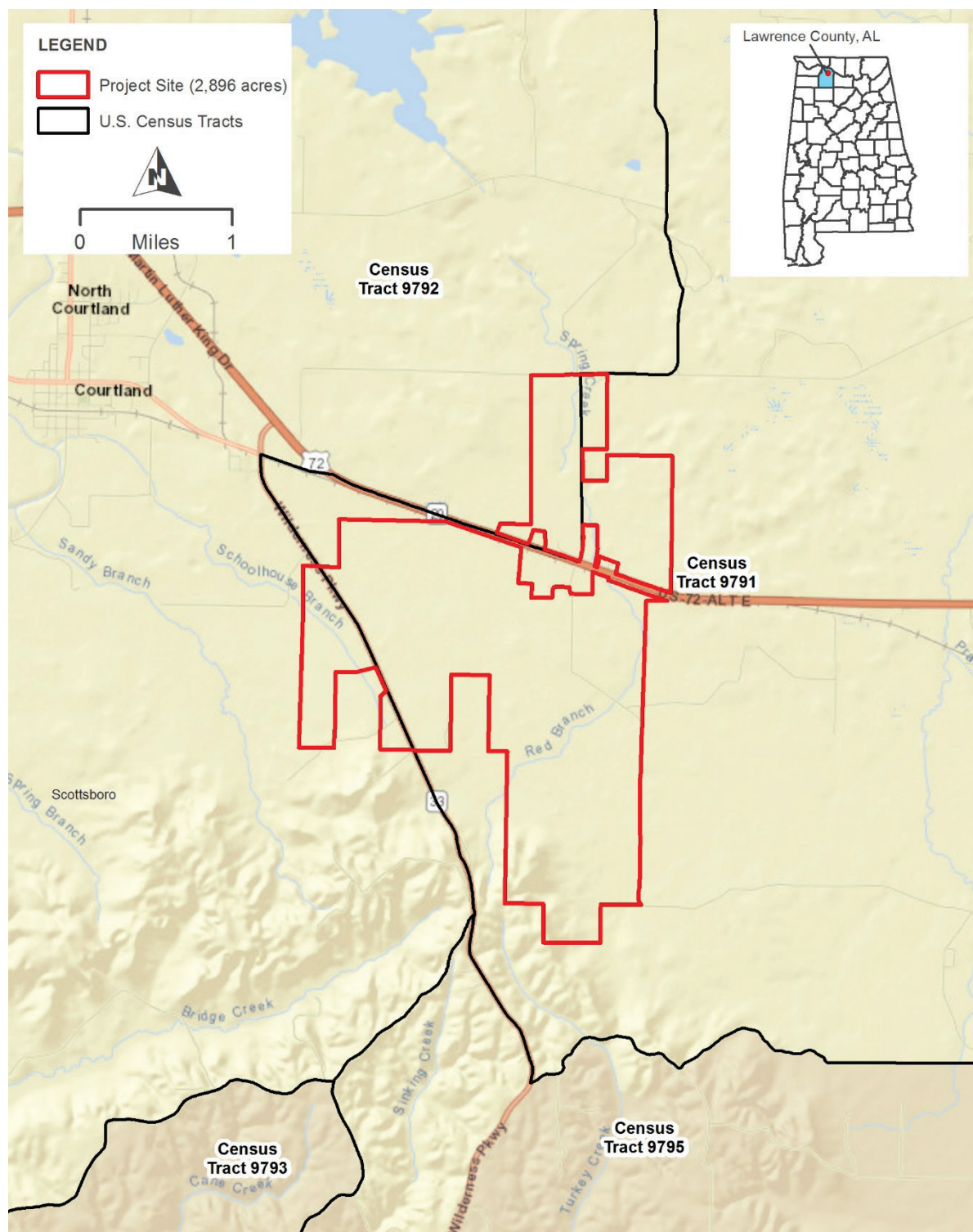
**Table 3-13. Population trends in the project area, county, and state**

Geography	2010 Census	2020 Census	Percent Change 2010-2020	Projection 2040	Percent Change 2020-2040
<b>CT 9791</b>	1,668	1,523	-8.7	--	--
<b>CT 9792</b>	4,655	4,125	-11.4	--	--
<b>Lawrence County</b>	34,339	33,073	-3.7	30,077	-9.1
<b>Alabama</b>	4,779,736	5,024,279	5.1	5,319,305	5.9

--" indicates that no data is available

**Sources:** Alabama State Data Center 2020; USCB 2022a

According to the 2015-2019 American Community Survey (2019 ACS) 5-year estimates, the population of Lawrence County, CT 9791, and CT 9792 all had higher median ages (42.4, 53.1, and 43.5, respectively) than the state as a whole (39.0). The state of Alabama had a notably higher percentage of people 25 years of age and over who were at least high school graduates (86.2 percent) than across CT 9791 (79.4 percent), CT 9792 (81.9 percent), and Lawrence County (79.3 percent).



**Figure 3-15. 2010 U.S. Census Bureau census tracts in the Project Site vicinity**

### 3.15.1.2 *Employment and Income*

According to the Alabama Department of Labor, Lawrence County had a 2021 annual average of monthly employment of 13,956 jobs (Table 3-14). The 2021 annual unemployment rate for Lawrence County was 2.9 percent, representing a 2.6-point

decrease from 2020. The 2021 county unemployment rate is lower than the 2021 state rate of 3.5 percent. According to the 2019 ACS, the median household income for Lawrence County was \$44,886, which was less than the state and the nation as a whole (\$50,536 and \$62,843, respectively). The median household income for CT 9791 (\$45,750) was higher than the county, while CT 9792 (\$38,149) was notably lower than CT 9791, the county, state, and nation.

**Table 3-14. Employment and income in the project area, county, and state**

Geography	2021 Employment	2021 Unemployment Rate	Median Household Income, 2019 ACS
CT 9791	--	--	\$45,750
CT 9792	--	--	\$38,149
Lawrence County	13,956	2.9	\$44,886
Alabama	2,168,756	3.5	\$50,536

**Source:** Alabama Department of Labor 2022; USCB 2022a.

Alabama Department of Labor employment data is based on annual average of monthly employment and seasonally adjusted at state level.

### 3.15.2 Environmental Consequences

This section describes the potential impacts to socioeconomic resources should the Proposed Action or No Action Alternative be implemented. Social and economic issues considered for evaluation within the impact area include changes in expenditures for goods and services and short- and long-term effects on employment and income.

#### 3.15.2.1 No Action Alternative

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no socioeconomic effects from the Project would occur.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would not affect local socioeconomic conditions. The potential future development and/or disposal of the site would affect socioeconomic conditions, although the magnitude and whether beneficial or adverse cannot be predicted at this time.

#### 3.15.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Under the Proposed Action, a new solar facility and associated substation and, potentially, a BESS would be built in the project area. Construction activities at the Project Site would take approximately 24 to 36 months to complete with a crew of approximately 150 to 500 workers at the site, depending on construction activities. Workers would include general laborers and electrical technicians. Work would generally occur five to seven days a week primarily during daylight hours. Short-term beneficial economic impacts would result from construction activities associated with the Project, including the purchase of materials,

equipment, and services and a temporary increase in employment and income. This increase would be local or regional, depending on where the goods, services, and workers were obtained. It is likely some construction materials and services would be purchased locally in Lawrence County and/or in adjacent counties. Most of the other components of the solar, transmission, and BESS facilities would be acquired from outside the local area. Also, most of the construction workforce would be sought locally or within the region, while a small portion of the construction workforce may come from out of the region. The direct impact to the economy associated with construction of the Project would be short term and beneficial.

The majority of the indirect employment and income impacts would be from expenditure of the wages earned by the workforce involved in construction activities, as well as the local workforce used to provide materials and services. Construction of the Project could have minor beneficial indirect impacts to population and short-term employment and income levels in Lawrence County.

During operation of the solar facility, small groups of operations and maintenance staff would be on site periodically for inspections and maintenance activities. Grounds maintenance and some other operation and maintenance activities may be conducted by local contractors. Therefore, operation of the solar facility would have a minor beneficial impact on employment and the population in Lawrence County.

The Project is not expected to negatively affect area property values with implementation of setbacks. As discussed in Section 3.7, long-range views from residential farm complexes, historic properties, and churches in the Project Area are generally limited by mature trees framing property boundaries, nearby fields, and roads. These findings are supported by Photo 3-15, Photo 3-16, and Photo 3-17, which show the proposed solar facility from key observation points.

Overall, socioeconomic impacts for the operation of the proposed solar facility would be beneficial and long-term, but minor relative to the total economy of the region. The transition of the Project Site from its current owner to TVA resulted in a decrease in the overall property tax base of Lawrence County, since TVA is not required to pay taxes.

### **3.16 Environmental Justice**

This section describes an overview of environmental justice considerations within the project area and the potential impacts to environmental justice populations that would be associated with the No Action and Proposed Action alternatives. Existing conditions for environmental justice populations are presented for the vicinity of the Project Site, where concentrated Project effects to these populations could occur. Project effects were also considered for the TL upgrade activities. Components of environmental justice that are presented include the proportions of the local population that are minority and low-income and the potential for effects to these populations.

#### **3.16.1 Affected Environment**

Environmental justice-related impacts are analyzed in accordance with EO 12898 to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations. While not subject to this EO, TVA routinely considers environmental justice in its NEPA review processes.

CEQ guidance directs identification of minority populations when either the minority population of the affected area exceeds 50 percent, or the minority population percentage of the study area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997). CEQ defines minority populations as people who identify themselves as Asian or Pacific Islander, American Indian or Alaskan Native, Black (not of Hispanic origin), or Hispanic. Due to including one of these minorities, those indicating two or more races are also considered minorities.

CEQ guidance specifies that low-income populations are to be identified using the annual statistical poverty threshold from the USCB Current Population Reports Series P-60 on Income and Poverty. The USCB-provided 2020 (the most current) poverty threshold for individuals under age 65 was \$13,465, and the official poverty rate for the U.S. as a whole in 2020 was 11.4 percent (USCB 2022b).

Based on CEQ guidance, USCB data reported in the 2019 ACS were used to identify minority and low-income populations in the project area. As discussed in more detail in Section 3.15.1, the Project Site overlaps five percent of USCB 2010 CT 9791's total area and 0.6 percent of Block Group 1, within CT 9792.

#### **3.16.1.1 Minority Population**

As of the 2019 ACS, minorities constituted 23.5 percent of the total population in Lawrence County (Table 3-15). This percentage is lower than the state minority percentage of 34.5. In the project area, CT 9791 had a minority population of 65.4 percent, and CT 9792 had a minority population of 52.2, higher than the county, state, and nation. Averaged together, these CTs have a minority population of 58.8 percent. According to the USEPA EJSCREEN, an environmental justice screening and mapping tool, the Project Site and the surrounding 1-mile area have an estimated minority population proportion of 44 percent (USEPA 2020d). The USCB dataset indicates a minority population in the project area that is higher than the 50 percent threshold noted as significant in CEQ guidance. The project area minority percentage is considerably higher than that of the county and state (Table 3-15).

**Table 3-15. Minority population in the project area, county, and state**

<b>Geography</b>	<b>Minority Population</b>	<b>% Minority Population</b>
<b>CT 9791</b>	1,037	65.4
<b>CT 9792</b>	2,098	52.2
<b>Lawrence County</b>	7,773	23.5
<b>Alabama</b>	1,681,321	34.5

Source: USCB 2022a

#### **3.16.1.2 Low-Income Population**

Based on the 2019 ACS, the poverty rate for all people in Lawrence County was 18.0 percent (Table 3-16). CTs 9791 and 9792 had poverty rates for all people of 13.1 and 19.4 percent, respectively. The poverty rate for CT 9792 is higher than the county, state, and nation. According to the USEPA EJSCREEN, the per capita income of all people on and near the Project Site (\$18,155) is lower than the county and state.



**Table 3-16. Poverty in the project area, county, and state**

<b>Geography</b>	<b>Per Capita Income, All People</b>	<b>Poverty Rate, Families</b>	<b>Poverty Rate, All People</b>
<b>CT 9791</b>	\$23,189	8.6	13.1
<b>CT 9792</b>	\$19,655	17.4	19.4
<b>Lawrence County</b>	\$23,557	13.9	18.0
<b>Alabama</b>	\$26,846	12.3	16.7

Source: USCB 2022a

**3.16.2 Environmental Consequences**

This section describes the potential impacts on minority and low-income populations should the Proposed Action or No Action Alternative be implemented. According to CEQ, adverse health effects to be evaluated within the context of environmental justice impacts may include bodily impairment, infirmity, illness, or death. Environmental effects may include ecological, cultural, human health, economic, or social impacts. Disproportionately high and adverse human health or environmental effects occur when the risk or rate of exposure to an environmental hazard or an impact or risk of an impact on the natural or physical environment for a minority or low-income population is high and appreciably exceeds the impact level for the general population or for another appropriate comparison group (CEQ 1997).

**3.16.2.1 No Action Alternative**

Under the No Action Alternative, TVA would not develop the North Alabama Utility-Scale Solar Facility, as proposed at this location; therefore, no disproportionately high and adverse direct or indirect impacts on minority or low-income populations would occur in association with the Project.

TVA would retain ownership of the property until decisions on its future development and/or disposal, assessed in subsequent NEPA reviews, are made. Until that point, TVA would carry out necessary site maintenance activities, such as periodic inspections and mowing of parts of the site. TVA may also enter into lease agreement(s) with local farmer(s) for continued agricultural operations. These activities would not affect local minority or low-income populations. Minority and low-income populations are present in the project area at generally higher rates than the county and state. The proportion of the population in the project area that is low-income is also higher than the official U.S. poverty rate of 11.4 percent. Depending on the specific plans, the potential future development and/or disposal of the site have the potential to disproportionately affect these populations.

**3.16.2.2 Proposed Action Alternative**

Under the Proposed Action Alternative, TVA would develop the North Alabama Utility-Scale Solar Facility and enter into a PPA for its ownership, operations, and maintenance for up to a 20-year period.

Minority and low-income populations are present in the project area at generally higher rates than the county and state. The proportion of the population in the project area that is low-income is also higher than the official U.S. poverty rate of 11.4 percent. However, the overall impacts of the proposed North Alabama Utility-Scale Solar Facility, as described in other sections in this chapter, most of which would occur during the 24- to 36-month construction period, would be minor, and off-site impacts would be negligible. As such, no disproportionately high or adverse direct or indirect impacts are expected to result from the

Proposed Action on minority or low-income populations due to human health or environmental effects. Rather, the Project is expected to have positive effects to the local economy that would potentially benefit low-income populations.

### 3.17 Cumulative Impacts

The 1978 CEQ regulations (40 CFR §§ 1500-1508) implementing the procedural provisions of the NEPA of 1969, as amended (42 USC § 321 et seq.) define cumulative impact as: "...the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions [RFFAs] regardless of what agency (federal or non-federal) or person undertakes such other actions." (40 CFR §1508.7).

A cumulative impact analysis must consider the potential impact on the environment that may result from the incremental impact of a project when added to other past, present and RFFAs (40 CFR § 1508.7). Baseline conditions reflect the impacts of past and present actions. The impact analyses summarized in the preceding sections are based on baseline conditions and, therefore, incorporate the cumulative impacts of past and present actions.

#### 3.17.1 Identification of Other Actions

Depending on the geographic area of analysis for each resource area, past, present, and RFFAs that are considered in this cumulative analysis are listed in Table 3-17. These actions were identified within the overall 10-mile geographic area of analysis as having the potential to, in aggregate, result in larger and potentially adverse impacts to the resources of concern.

**Table 3-17. Summary of other past, present, or reasonably foreseeable future actions within a 10-mile radius of the Proposed Action**

Action	Description	Project Type
Mallard Fox West Industrial Park Expansion	A 1,068-acre industrial park with rail access approximately seven miles southeast of the Project Site. Existing industries on site include Nucor Tubular, which added 35 new jobs to the area in 2019, and Jack Daniels Cooperage. Two new industries (CCI Manufacturing and Progressive Pipe) are expected to add 78 new jobs to the area. There are 907 acres available for future expansion (EDPA 2020; Moulton Advertiser 2020; NARCOG 2020).	Past/Present/RFFA
Resurfacing US 72A	Proposed resurfacing of US 72A from CR 585 to SR 33, approximately 1.5 miles west of the Project Site (ALDOT 2020a).	RFFA
Lawrence County Industrial Airpark Expansion	A 2,240-acre industrial park adjacent to the Courtland Airport, approximately four miles west of the Project Site. The Lockheed Martin Hypersonics Production Facility completed in 2020 on the site plans to add 72 new jobs over the next three years. There are 700 acres available for future expansion (Alabama Department of Commerce 2019, EDPA 2020, NARCOG 2020)	RFFA

Action	Description	Project Type
Hood Harris Water Access Site	A proposed 1,000-acre industrial site adjacent to the Tennessee River and immediately west of the former International Paper mill, approximately six miles northwest of the Project Site (EDPA 2020).	RFFA
Rebman Industrial Site	A proposed 317-acre industrial site adjacent to the Tennessee River, approximately eight miles northwest of the Project Site (EDPA 2020).	RFFA

### 3.17.2 Geographic Area of Analysis

The appropriate geographic area over which past, present, and RFFAs could reasonably contribute to cumulative effects is variable and dependent on the resource evaluated. The geographic area of analysis includes all or portions of the past, present, and RFFAs within the 10-mile area (approximately 200,960 acres), as relevant to the particular environmental resource.

To address cumulative impacts, the existing affected environment surrounding the project area, as relevant to the resource area, was considered in conjunction with the environmental impacts described in Chapter 3. These combined impacts are defined by CEQ as “cumulative” in 40 CFR § 1508.7 and may include individually minor, but collectively significant actions taking place over a period of time. The potential for cumulative effects to the identified environmental resources of concern are analyzed below for the Proposed Action.

### 3.17.3 Cumulative Impacts by Resource

#### 3.17.3.1 Land Use

The RFFAs such as the Mallard Fox West Industrial Park Expansion, Lawrence County Industrial Airpark Expansion, Hood Harris Water Access Site, and Rebman Industrial Site would contribute to additional changes in land use from agricultural and forested land to industrial in the area. As described in Section 3.2.1, Lawrence County does not have a land use plan for the unincorporated portions of the county, nor are lands subject to zoning restrictions. Therefore, the Proposed Action, when considered with the past, present, and RFFAs listed in Table 3-17, could have minor, cumulative impacts on land use in the area.

#### 3.17.3.2 Geology, Soils, and Prime Farmland

Land use changes from agricultural to industrial may inhibit groundwater infiltration and recharge to the local aquifer. Lowering infiltration rate from the surface may lower dissolution of the bedrock and, thus, slow the creation of sinkholes. These effects, whether positive or negative, are expected to be minor.

Past, present, and RFFAs, together with the Proposed Action, would remove approximately 4,517 acres of farmland, some of which is designated as prime farmland, from potential agricultural use. These permanent changes to farmland would affect approximately one percent of the farmland in Lawrence County (USDA 2019a), resulting in minor, cumulative impacts on prime farmland in the area.

### **3.17.3.3 Water Resources**

#### **3.17.3.3.1 Groundwater**

Past, present, and RFFAs, together with the Proposed Action, would remove approximately 4,517 acres of agricultural land and several hundred acres of forested land. Land use would change from agricultural to industrial and may inhibit groundwater infiltration and recharge to the local aquifer. The Tuscumbia-Fort Payne aquifer underlies the Project Site and is recharged by water which infiltrates and percolates through the regolith. If the industrial land use includes paving the land surface and diverting surface water, then groundwater recharge would be expected to be lowered in the area. However, the Tuscumbia-Fort Payne aquifer is documented to have high recharge rates and high pumping rate for wells installed in the aquifer. Cumulative impacts of past, present, and RFFAs, together with the Proposed Action, would be expected to be minor.

#### **3.17.3.3.2 Surface Water and Wetlands**

Past, present, and RFFAs within the affected watersheds are either underway or planned and would affect approximately 4,517 acres of agricultural land and several hundred acres of forested land. Minor impacts are anticipated due to Project construction effects to approximately 14,891 LF of ephemeral streams, 96 LF of two perennial or intermittent streams, and 0.07 acre of a wetland. The 2020 Navigable Waters Protection Rule was vacated in 2021 and the interpretation of waters of the U.S. definition has reverted back to the pre-2015 definition which includes ephemeral stream impacts as regulated by USACE. As a standard practice, TVA would employ BMPs to protect streams from indirect impacts (TVA 2017a). Impacts to perennial and intermittent streams are not expected; however, the impacts to ephemeral streams would require both a USACE 404 permit and ADEM 401 permit. An approved jurisdictional determination is recommended from the USACE to determine jurisdictional waters. Additionally, in accordance with TVA and ADEM requirements, 50-foot buffers surrounding jurisdictional perennial and intermittent streams in developed portions of the Project Site would be maintained as an avoidance measure. These developments consist of road improvement projects, manufacturing complexes, industrial expansion, and associated railway access. Similar to the Project, past, present, and RFFAs would also be subject to CWA jurisdiction, ensuring current and foreseeable wetland impacts are considered, permitted, and/or mitigated in accordance with wetland regulations. This regulatory oversight ensures maintenance of the chemical, biological, and physical integrity of the aquatic environment, including wetlands, within these watersheds for the long term. Cumulative effects are considered in the CWA permitting process to ensure individual waterbody impacts do not collectively result in degradation to Waters of the U.S., including jurisdictional wetland and stream resources. Due to USACE and ADEM oversight as well as implementation of BMPs and wetland mandates, the Project is not anticipated to contribute to cumulative stream and wetland impacts at the watershed scale.

#### **3.17.3.3.3 Floodplains**

Considering the activities and facilities described in Table 3-17, along with the Project, cumulative impacts to floodplains and their natural and beneficial values would be minimal because development would be subject to Lawrence County floodplain regulations, which, by design, would minimize adverse impacts.

#### **3.17.3.4 Biological Resources**

Since the Project Site is in a relatively undeveloped, rural county, cumulative impact to vegetation, wildlife, aquatic life, and threatened and endangered species may be more minimal given the presence of large areas of undeveloped, forested lands. Given that

agriculture is the dominant land use in the areas suited for development, future development would likely not result in significant impacts to important terrestrial habitats. While RFFAs in the surrounding region could remove available habitats for wildlife in the foreseeable future, the impacts of the Project would not result in significant cumulative impacts to vegetation and wildlife due to the small area of vegetation to be removed and the type of forest and other vegetative communities to be removed. Past, present, and RFFAs and their associated direct and indirect impacts are reasonably certain to gradually degrade existing streams and threatened and endangered aquatic species within the Project Site over the next several decades. Overall, because the impacts to federally and state-listed plant and animal species would be avoided or minimized in consultation with the USFWS, cumulative effects to threatened and endangered plants would be minor.

#### **3.17.3.5 Natural Areas, Parks, and Recreation**

Future projects in the geographic area of analysis that include use of undeveloped lands to support industrial or other intensive developments could reduce the availability of lands suitable for recreation within Lawrence County. This would decrease the amount of land available to support dispersed outdoor recreation activities such as hunting, fishing, and nature observation. The combined effect of these future land development actions and the Project would likely result in a slight reduction in resources for dispersed recreation. However, in view of the relatively large amounts of rural and undeveloped lands within the county, cumulative impacts on dispersed recreation opportunities are expected to be minor.

Because developed outdoor recreation areas are located sufficiently distant from the Project, no direct, indirect or cumulative impacts on these resources is expected.

#### **3.17.3.6 Visual Resources**

The Proposed Action would alter the visual character of the Project Site by converting a large area of cropland and forest to numerous low-profile parallel rows of PV panels, an electrical substation, and the energy storage facility. Much of the developed Project Site would be screened from nearby public road and residences. Visual impacts from other locations around the site perimeter would be low to moderate and mostly at middle ground distances. The potential industrial development of the other sites listed in Table 3-17 could result in greater visual impacts due to the size of the buildings and supporting infrastructure. Because the visual impacts of the Proposed Action would be comparatively low and localized, the Proposed Action has little potential to result in adverse cumulative visual impacts.

#### **3.17.3.7 Noise**

Past, present, and RFFAs are expected to result in noise impacts in the project area. With the exception of the proposed resurfacing of US 72A, the other projects are all located over four miles from the Proposed Action; therefore, it is not anticipated that activities associated with the Proposed Action would contribute to cumulative impacts to noise receptors. The proposed resurfacing would result in minor, short-term noise impacts. While the Proposed Action has the potential to contribute to cumulative impacts on noise, these impacts would be minor and short term.

#### **3.17.3.8 Air Quality and Greenhouse Gas Emissions**

Past, present, and RFFAs are expected to contribute a significantly higher percentage of non-GHG and GHG emissions to the region than the Proposed Action. This includes both temporary construction and long-term operational emissions. Additionally, the operational emissions from these other actions would be expected to have at least minor negative

impact to air quality in the region. However, the Proposed Action would provide at least a minor beneficial impact on air quality in the region due to producing renewable energy, which reduces fossil-fueled utility power generation. In addition, all other actions are expected to comply with applicable air quality requirements and permitting and would implement emissions reduction actions as part of construction activities (e.g., wetting of disturbed soils and other fugitive dust control measures). Therefore, no significant cumulative impacts from the Proposed Action and other actions are expected.

#### **3.17.3.9 Cultural Resources**

The Project would avoid all of the NRHP-eligible or undetermined cultural resources on the Project Site, as well as the unnamed cemetery. While the Project would have visual effects on three listed or eligible architectural resources, the effects would not be adverse due to modern intrusions and/or setbacks from the resources that would be maintained during the life of the Project. While the past, present, and RFFAs may have adverse effects on cultural resources, the Project would not contribute to cumulative effects due to the Project effects being avoided, not considered adverse, or minimized through use of setbacks. Two archaeological sites were identified in the TL upgrade locations; however, the TL upgrades would not adversely affect the identified portions of these sites. TVA has consulted with AHC and federally recognized Indian tribes on its NRHP eligibility determinations, findings of effect, and avoidance, minimization, and mitigation measures.

#### **3.17.3.10 Utilities**

The Project could cause occasional, short-term adverse impacts to local utilities such as electricity connections when conducting the TL upgrades or bringing the solar PV facility on-line or during routine maintenance of the facility. Thus, the Project, along with the past, present, and RFFAs, may contribute to some minor short-term outages in the project area as these facilities are constructed or maintained. Given the nature of the Proposed Action, long-term cumulative adverse impacts to utilities are not anticipated.

#### **3.17.3.11 Waste Management**

Past, present, and RFFAs, together with the Proposed Action, would create new waste streams within the area. Storage and use of liquid materials in the form of petroleum-based oils and fuels, and generation of liquid and solid wastes in the form of used oil, construction debris, packing materials, and general construction waste would also occur. Overall, the Project effects, likely similar to the past, present, and RFFAs, would be mitigated through implementation of BMPs for waste and wastewater, SPCC plans, and hazardous material management plans. With proper planning and implementation of BMPs, adverse cumulative effects from the Project in relation to waste management would not occur.

#### **3.17.3.12 Public Health and Safety**

As with the past, present, and RFFAs, the Project would comply with OSHA regulations and health and safety plans to prevent or minimize the negative effects of worker-related accidents. The Project would also comply with SPCC plans, hazardous material plans, and other waste management BMPs to avoid or minimize related health and safety issues. With proper planning and implementation of BMPs, cumulative effects from the Project in relation to public health and safety would not occur.

#### **3.17.3.13 Transportation**

While not anticipated as a need based on a traffic study, the Project would implement minimization and mitigation measures in coordination with ALDOT if Project construction disrupts normal traffic patterns; thus, Project effects to road traffic would be temporary,



minor, and minimized or mitigated. While effects to local, regional, and major airports is not anticipated, TVA coordinated with the FAA regarding potential effects to the Courtland Airport given its proximity. Past, present, and RFFAs are also expected to result in minor impacts to transportation. The proposed resurfacing of US 72A could contribute to cumulative impacts to traffic depending on the timing of that project. However, impacts would be short term and coordination could occur to minimize impacts to local commuters. Overall, with implementation of minimization and mitigation measures, the Project is not expected to contribute to cumulative effects to area transportation.

#### **3.17.3.14 Socioeconomics**

The Lockheed Martin Hypersonics Production Facility and the new Nucor Tubular, CCI Manufacturing, and Progressive Pipe facilities at the Mallard Fox West Industrial Park increased or will increase the numbers of jobs in the area by a total of 185. Economic benefits of the Proposed Action and the past, present, and RFFAs considered for this analysis include the purchase of materials, equipment, and services, and moderate short- to long-term increases in employment and income. These increases would be local or regional, depending on where the goods, services, and workers have been or are obtained. Overall, short- to long-term, moderate beneficial cumulative impacts to socioeconomics would result from implementation of the Proposed Action in combination with the other actions considered in the area. Indirect, cumulative impacts to socioeconomics would also occur from the expenditure of wages earned by the workforce involved in construction activities and facility operations.

#### **3.17.3.15 Environmental Justice**

Minority and low-income populations are present in the project area at generally higher rates than the county and state. Demographic characteristics of the project area are expected to change temporarily in response to an increased construction workforce, but this change would not be significant. There is a potential that these communities would be indirectly impacted due to an increase in noise during construction activities of the Proposed Action and RFFAs. Because these short-term actions may coincide, potential, indirect cumulative impacts may occur on a local basis. Such physical impacts associated with construction activities would be temporary and mitigated through BMPs identified in Section 2.5.

### **3.18 Unavoidable Adverse Environmental Impacts**

Unavoidable adverse impacts are the effects of a proposed action on natural and human resources that would remain after mitigation measures or BMPs have been applied. Mitigation measures and BMPs are typically implemented to reduce a potential impact to a level that would be below the threshold of significance as defined by CEQ and case law. The Proposed Action could cause some unavoidable adverse environmental effects (Table 2-2). Specifically, construction activities would temporarily increase noise, traffic, and health and safety risks and temporarily affect air quality, GHG emissions, and visual aesthetics of the Project Site vicinity. Mitigation measures are listed in Section 2.5. Construction activities would primarily be limited to daytime hours, which would minimize noise impacts. Temporary increases in traffic would be minimized or mitigated, if needed, by specific measures designed to address traffic flow issues, in coordination with ALDOT. Temporary increases in health and safety risks would be minimized by implementation of the Project health and safety plan. Construction and operations would have minor, localized effects on soil erosion and sedimentation that would be minimized by establishment and maintenance of stream and wetland buffers, soil stabilization and vegetation management measures. The buffers would minimize effects to these and other visual resources, during

both construction and operation. Construction of the Project would result in impacts to approximately 14,891 LF of ephemeral streams due to the installation of pilings to support the solar PV arrays and culverts for road crossings, 0.07-acre wetland fill for a road crossing, and 96 LF of intermittent and perennial stream disturbance. The 2020 Navigable Waters Protection Rule was vacated in 2021 and the interpretation of waters of the United States definition has reverted back to the pre-2015 definition which includes ephemeral stream impacts as regulated by USACE. As a standard practice, TVA would employ BMPs to protect streams from indirect impacts (TVA 2017a). Impacts to perennial and intermittent streams are not expected; however, the impacts to ephemeral streams would require both a USACE 404 permit and ADEM 401 permit. An approved jurisdictional determination is recommended from the USACE to determine jurisdictional waters. Additionally, in accordance with TVA and ADEM requirements, 50-foot buffers surrounding jurisdictional perennial and intermittent streams in developed portions of the Project Site would be maintained as an avoidance measure. The Project would change land uses on the Project Site from primarily agricultural to solar uses, where these practices are not presently occurring; however, Lawrence County does not have a land use plan for the unincorporated portions of the county nor are lands subject to zoning restrictions.

With the application of appropriate BMPs, no unavoidable adverse effects to groundwater are expected. Long-term habitat loss would occur due to alteration of land use on 1,459 acres of the Project Site. Revegetation of the Project Site with native and/or non-invasive grasses and herbaceous vegetation would help minimize effects to open, grassy habitats. Adverse impacts to rare, threatened, and endangered species will be avoided through the implementation of several mitigation measures. Approximately 84 acres of forest that may provide summer roosting habitat for endangered and threatened bats would be cleared during winter months, when bats are not likely to be present on the Project Site. The USFWS concurred with TVA's determination that the Project is not likely to adversely affect federally listed species in letters dated January 13, 2021, and February 25, 2022.

### **3.19 Relationship of Short-Term Uses and Long-Term Productivity**

Short-term uses are those that generally occur on a year-to-year basis. Examples are wildlife use of forage, timber management, recreation, and uses of water resources. Long-term productivity is the capability of the land to provide resources, both market and non-market, for future generations. In this context, long-term impacts to site productivity would be those that last beyond the life of the Project. The Proposed Action would affect short-term uses of the Project Site by converting it from agricultural and forested land to solar power generation. The effects on long-term productivity would be minimal, as existing land uses could be readily restored on the Project Site following the decommissioning and removal of the solar facility.

### **3.20 Irreversible and Irretrievable Commitments of Resources**

Irreversible or irretrievable commitments of resources occur when resources would be consumed, committed, or lost because of a project. The commitment of a resource would be considered irretrievable when a project would directly eliminate the resource, its productivity, or its utility for the life of a project and possibly beyond. Project-related construction and operation activities would result in an irretrievable and irreversible commitment of natural and physical resources. The implementation of the Proposed Action would involve irreversible commitment of fuel and resource labor required for the construction, maintenance, and operation of the solar PV facility. Because removal of the solar arrays and associated on-site infrastructure could be accomplished rather easily, and the facility would not irreversibly alter the site, the Project Site could be returned to its

original condition or used for other productive purposes once the solar facility is decommissioned. Most of the solar facility components could also be recycled after the facility is decommissioned.



## CHAPTER 4 – LIST OF PREPARERS

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Involvement: Transmission project description, Document review

**A. Chevales Williams**

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Position: Program Manager, Flood Risk (TVA)  
Education: M.S. and B.S., Civil Engineering  
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Involvement: Floodplains

## **CHAPTER 5 – DRAFT ENVIRONMENTAL IMPACT STATEMENT RECIPIENTS**

### **5.1 Federal Agencies**

U.S. Department of Agriculture, Natural Resources Conservation Service,  
Auburn, Alabama  
U.S. Department of Agriculture, Forest Service, National Forests, Montgomery,  
Alabama  
U.S. Department of Interior, Office of Environmental Planning and Compliance,  
Washington, D.C.  
U.S. Department of Transportation Federal Aviation Administration, Southern  
Region Office of Airports, College Park, Georgia  
U.S. Environmental Protection Agency, NEPA Program Office  
U.S. Fish and Wildlife Service, Southeast Region, Daphne, Alabama

### **5.2 Federally Recognized Tribes**

Absentee Shawnee Tribe of Indians of Oklahoma  
Alabama-Coushatta Tribe of Texas  
Alabama-Quassarte Tribal Town  
Cherokee Nation  
The Chickasaw Nation  
Coushatta Tribe of Louisiana  
Eastern Band of Cherokee Indians  
Eastern Shawnee Tribe of Oklahoma  
Jena Band of Choctaw Indians  
Kialegee Tribal Town  
The Muscogee (Creek) Nation  
Poarch Band of Creek Indians  
The Seminole Nation of Oklahoma  
Shawnee Tribe  
Thlopthlocco Tribal Town  
United Keetoowah Band of Cherokee Indians in Oklahoma

### **5.3 State and Local Agencies**

Alabama Department of Environmental Management  
Alabama Historical Commission  
Alabama Department of Transportation  
North-Central Alabama Regional Council of Governments

### **5.4 Organizations and Individuals**

Friends of the General Joe Wheeler Home Foundation



## CHAPTER 6 – LITERATURE CITED

- Alabama Department of Commerce. 2019. Lockheed Martin to base hypersonic programs in Alabama, add 272 jobs. Available at <https://www.madeinalabama.com/2019/09/lockheed-martin-to-base-hypersonics-programs-in-alabama-add-272-jobs/> (accessed September 23, 2020).
- Alabama Department of Environmental Management (ADEM). 2017 Water Division, Water Quality Program, CHAPTER 335-6-10 Water Quality Criteria. ed. James E. McIndoe; Lynn Sisk; Chris L. Johnson. Montgomery, Alabama, page 11-2.
- \_\_\_\_\_. 2020a. Groundwater Part 1. Available at <http://adem.alabama.gov/moreInfo/pubs/GWpart1.pdf> (accessed October 2020).
- \_\_\_\_\_. 2020b. Final 2020 ADEM 303(d) List. Montgomery, Alabama. Available at <https://adem.alabama.gov/programs/water/wquality/2020AL303dList.pdf> (accessed September 2020).
- Alabama Department of Labor. 2022. Civilian Labor Force Data. 2021 Unemployment Data. Available at <http://www2.labor.alabama.gov/LAUS/21on21.pdf> (accessed March 16, 2022).
- Alabama Department of Transportation (ALDOT). 2004. ALDOT Utilities Manual. Available at <https://www.dot.state.al.us/rwweb/util/ALDOTDesignUtman.pdf> (accessed October 2020).
- \_\_\_\_\_. 2020a. Alabama Statewide Transportation Improvement Program. Highway Projects – Lawrence County. Available at [https://cpmsapps.dot.state.al.us/OfficeEngineer/ProjectReports/StipRpts/Hwy/40\\_Hwy.pdf](https://cpmsapps.dot.state.al.us/OfficeEngineer/ProjectReports/StipRpts/Hwy/40_Hwy.pdf) (accessed September 23, 2020).
- \_\_\_\_\_. 2020b. Alabama Traffic Data. Available at <https://aldotgis.dot.state.al.us/TDMPublic/> (accessed October 2020).
- Alabama Invasive Plant Council. 2012. 2012 List of Alabama's Invasive Plants by Land-Use and Water-Use Categories. Available at <https://www.se-eppc.org/alabama/2012-updatedALIPCinvasiveplantlist.pdf> (accessed February 2022).
- Alabama Soil and Water Conservation Committee (ASWCC). 2018. Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Area, Montgomery, Alabama. Available at <https://alconservationdistricts.gov/alabama-handbook-section-section> (accessed September 2020).
- Alabama State Data Center. 2020. Alabama County Population 2000-2010 and Projections 2020-2040. Available at <https://alabama.app.box.com/s/go46dtnv2ktiyo5lwx7l8qko767rls7n> (accessed September 24, 2020).

- AT&T. 2020. Wireless Coverage. Available at <https://www.att.com/maps/wireless-coverage.html> (accessed April 2022).
- Bailey, M. A., J. N. Holmes, K. A. Buhlmann, and J. C. Mitchell. 2006. Habitat Management Guidelines for Amphibians and Reptiles of the Southeastern United States. Partners in Amphibian and Reptile Conservation Technical Publication HMG-2, Montgomery, Alabama.
- Boschung, H. T., and R. L. Mayden. 2004. Fishes of Alabama. Smithsonian Institution Press, Washington, D.C.
- Bosong. 1987. Geohydrology and susceptibility of major aquifers to surface contamination in Alabama; Area 1. U.S. Geological Survey, Tuscaloosa, Alabama.
- Brady, J., T. H. Kunz, M. D. Tuttle and D. Wilson. 1982. Gray bat recovery plan. U.S. Fish and Wildlife Service, Denver, Colorado.
- Brim Box, J. and J. Mossa. 1999. Sediment, land use, and freshwater mussels: prospects and problems. *Journal of the North American Benthological Society* 18(1):99-117.
- Bull, J. 1952. The General Merchant in the Economic History of the New South. *The Journal of Southern History* 18(1):37-59.
- Burch, J. B. 1989. North American Freshwater Snails. Malacological Publications: Hamburg, Michigan.
- Burr, B. M., and M. L. Warren, Jr. 1986. Distributional atlas of Kentucky fishes. Kentucky Nature Preserves Commission, Scientific and Technical Series No. 4, Frankfort, Kentucky.
- Carpenter, G.M. 2017. Bat population status and roost selection of tri-colored bats in the Great Smoky Mountains National Park in the era of White-Nose Syndrome. Master's Thesis, University of Tennessee.
- Clark, T.D. 1944 Pills, Petticoats, and Plows: The Southern Country Store. Bobbs Merrill Company, Indianapolis, Indiana.
- Corbisier, C. 2003. Living with noise. *Public Roads* 67(1).
- Council on Environmental Quality (CEQ). 1997. Environmental Justice Guidance Under the National Environmental Policy Act. Available at [http://www3.epa.gov/environmentaljustice/resources/policy/ej\\_guidance\\_nepa\\_ceq1297.pdf](http://www3.epa.gov/environmentaljustice/resources/policy/ej_guidance_nepa_ceq1297.pdf) (accessed May 2020).
- Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of Wetlands and Deep Water Habitats of the United States. U.S. Fish and Wildlife Service.
- Ebersole, Sandy M., Steven Driskell, and Anthony M. Tavis. 2011. Geology Mapping and Hazards Section. Prepared by Geological Survey of Alabama. Available at [https://www.gsa.state.al.us/img/Geological/Hazards/Landslides/Landslides\\_Poster\\_AdobeReduced.pdf](https://www.gsa.state.al.us/img/Geological/Hazards/Landslides/Landslides_Poster_AdobeReduced.pdf) (accessed November 2020).



- Economic Development Partnership of Alabama (EDPA). 2020. AdvantageSite Locations – Property Search. Available at <https://advantagealabama.com/?sorting=featured%20desc,%20name%20asc&showpropertyonmap=true&mapextent=-9743670.040665405,4106482.651255138,-9691310.67629013,4137974.7069085883&county=Lawrence%20County> (accessed September 24, 2020).
- Etnier, D. A., and W. C. Starnes. 1993. The fishes of Tennessee. University of Tennessee Press, Knoxville, Tennessee.
- Federal Aviation Administration (FAA). 2018. Technical Guidance for Evaluating Selected Solar Technologies on Airports. Available at [https://www.faa.gov/airports/environmental/policy\\_guidance/media/FAA-Airport-Solar-Guide-2018.pdf](https://www.faa.gov/airports/environmental/policy_guidance/media/FAA-Airport-Solar-Guide-2018.pdf) (accessed November 2020).
- \_\_\_\_\_. 2022. Notice Criteria Tool. Available at <https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm> (accessed April 2022).
- Federal Railroad Administration (FRA). 2020. The Train Horn Rule and Quiet Zones. Available at <https://railroads.dot.gov/highway-rail-crossing-and-trespasser-programs/train-horn-rulequiet-zones/train-horn-rule-and-quiet> (accessed November 2020).
- Fenneman. 1928. Physiographic Divisions of the United States. *Annals of the Association of American Geographers* 18(4): 261-353.
- Fossil Spot. 2008. Fossil Sites – Data for Alabama. Available at <http://fossilspot.com/STATES/AL.HTM> (accessed November 2020).
- Geological Survey of Alabama (GSA). 2020. Sinkhole Data and Maps. Available at <https://www.gsa.state.al.us/gsa/geologic/hazards/sinkholes> (accessed October 2020).
- Gibbons, W. and M. Dorcas. 2005. Snakes of the Southeast. University of Georgia Press, Athens, Georgia.
- Griffith, G. E., Omernik, J. M., Comstock, J. A., Lawrence, S., Martin, G., Goddard, A., Hulcher, V. J., and Foster, T. 2001. Ecoregions of Alabama and Georgia, (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,700,000).
- Grossman, D. H., D. Faber-Langendoen, A. S. Weakley, M. Anderson, P. Bourgeron, R. Crawford, K. Goodin, S. Landaal, K. Metzler, K. D. Patterson, M. Pyne, M. Reid, and L. Sneddon. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume I. The National Vegetation Classification System: development, status, and applications. The Nature Conservancy, Arlington, Virginia.
- Harvey, M.J., J.S. Altenbach, and T.L. Best. 2011. Bats of the United States and Canada. Johns Hopkins University Press, Baltimore, MD.

- HDR Engineering, Inc. (HDR). 2022. Traffic Impact Analysis, Lawrence County Solar Project, Lawrence County, Alabama. Report submitted to TVA.
- Iowa Environmental Mesonet (IEM). 2020. Alabama Long-Term Climate Sites, Muscle Shoals Area Station, Monthly Average Mean Temperatures, 1983-. Available at <https://mesonet.agron.iastate.edu/climodat/> (accessed October 2020).
- Joe Wheeler Electric Membership Cooperative (JWEMC). 2020. Outage Map. Available at <http://35.130.153.51/outagemap/OMSPublic.jpg> (accessed April 2022).
- Joseph, J. W., David E. Port, Melissa Umberger, and Matthew Taliaferro. 2002. An African-American Presence: Archaeological Investigations at the 1818 Hickman Log Cabin and the Cook's House at Pond Spring Plantation (1LA663), Lawrence County, Alabama. New South Associates, Stone Mountain, Georgia.
- King, M., L. Marshall, and L. Smith. 2009. North Alabama's Tuscumbia, Courtland, and Decatur Railroad and Its Role during Cherokee Emigration/Removal Beginning in 1837. Southeastern Anthropological Institute, Northwest Shoals Community College, Muscle Shoals, Alabama. Funded by the National Park Service Challenge Cost Share Program.
- Kurta, A, S. W. Murray, and D. H. Miller. 2002. Roost selection and movements across the summer landscape. In Kurta, A. and J. Kennedy, eds. The Indiana Bat: Biology and Management of an Endangered Species. Bat Conservation International, Austin, Texas.
- LandScope America. 2020. Interior Low Plateau Ecoregion. Available at [http://www.landscape.org/explore/natural\\_geographies/ecoregions/Interior%20Low%20Plateau/](http://www.landscape.org/explore/natural_geographies/ecoregions/Interior%20Low%20Plateau/) (accessed October 2020).
- Lawrence County. 2019. Lawrence County Parcel Viewer. Available at [https://isv.kcsgis.com/al.lawrence\\_revenue/](https://isv.kcsgis.com/al.lawrence_revenue/) (accessed May 2020).
- Leverett, Robert 1996. Definitions and History in Eastern old-growth forests: prospects for rediscovery and recovery. Edited by Mary Byrd Davis. Island Press, Washington D.C. and Covelo, California.
- Lichvar, R. W., D. L. Banks, W. N. Kirchner, and N. C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. ISSN 2153 733X.
- Mack, J. 2001. Ohio Rapid Assessment Method for Wetlands, Version 5.0, User's Manual and Scoring Forms. Columbus: Ohio Environmental Protection Agency, Division of Surface Water, 401/Wetland Ecology Unit, EPA Technical Report WET/2001-1.
- Lichvar, R. W., M. Butterwick, N. C. Melvin, and W. N. Kirchner. 2014. The National Wetland Plant List: 2014 update of wetland ratings. Phytoneuron 2014-41: 1-42. ISSN 2153 733X (n.d.).
- Meeks, S. C., and D. G. Anderson. 2012. Evaluating the Effect of the Younger Dryas on Human Population Histories in the Southeastern United States. Pp. 111-138 in

- Hunter-Gatherer Behavior: Human Response During the Younger Dryas, edited by M. I. Eren. Left Coast Press, Walnut Creek, California.
- Mirarchi, R. E., J. T. Garner, M. F. Mettee, and P. E. O'Neil. 2004. Alabama wildlife. Volume 2. Imperiled aquatic mollusks and fishes. University of Alabama Press, Tuscaloosa, Alabama.
- Moulton Advertiser. 2020. New industries announce plans to locate in Lawrence County. Available at [https://www.moultonadvertiser.com/news/local/article\\_fb58e1ac-33e9-11ea-ba27-bb00b0af6a92.html](https://www.moultonadvertiser.com/news/local/article_fb58e1ac-33e9-11ea-ba27-bb00b0af6a92.html) (accessed September 23, 2020).
- National Geographic. 2002. Field Guide to the Birds of North America (4<sup>th</sup> ed.). National Geographic Society, Washington D.C.
- National Institute for Occupational Safety and Health (NIOSH). 2014. EMF (Electric and Magnetic Fields). Available at <https://www.cdc.gov/niosh/topics/emf/default.html> (accessed April 2021).
- National Oceanic and Atmospheric Administration (NOAA). 2020. National Centers for Environmental Information, Climate at a Glance: County Time Series. Available at <https://www.ncdc.noaa.gov/cag/county/time-series> (accessed December 15, 2020).
- NatureServe. 2020. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available at <http://explorer.natureserve.org> (accessed September 2020).
- Noltie, D. B., and C. M. Wicks. 2001. How hydrogeology has shaped the ecology of Missouri's Ozark cavefish, *Amblyopsis rosae*, and southern cavefish, *Typhlichthys subterraneus*: insights on the sightless from understanding the underground. *Environmental Biology of Fishes* 62: 171-194.
- North Alabama Gas District. 2020. Service. Available at <https://www.nagd.com/service> (accessed April 2022).
- North Carolina State University. 2017. Health and Safety Impacts of Solar Photovoltaics. NC Clean Energy Technology Center, Raleigh, North Carolina. Available at [https://nccleantech.ncsu.edu/wp-content/uploads/2018/05/Health-and-Safety-Impacts-of-Solar-Photovoltaics-2017\\_white-paper.pdf](https://nccleantech.ncsu.edu/wp-content/uploads/2018/05/Health-and-Safety-Impacts-of-Solar-Photovoltaics-2017_white-paper.pdf) (accessed April 2021).
- North Central Alabama Regional Council of Governments (NARCOG). 2020. Comprehensive Economic Development Strategy. 2020 Annual Performance Report. Available at [https://www.narcog.org/images/NARCOG\\_2020\\_CEDS\\_Annual\\_Performance\\_Report\\_Draft\\_Sept\\_2020.pdf](https://www.narcog.org/images/NARCOG_2020_CEDS_Annual_Performance_Report_Draft_Sept_2020.pdf) (accessed September 23, 2020).
- Page, L. M., and B. M. Burr. 2011. Peterson field guide to freshwater fishes of North America north of Mexico. Second edition. Houghton Mifflin Harcourt, Boston, Massachusetts.

- Paleontology Portal. 2020. Alabama, US. Paleontology and geology. Available at [http://paleoportal.org/index.php?globalnav=time\\_space&sectionnav=state&name=Alabama](http://paleoportal.org/index.php?globalnav=time_space&sectionnav=state&name=Alabama) (accessed October 2020).
- Parker, Patricia L., and Thomas F. King. 1998. *Guidelines for Evaluating and Documenting Traditional Cultural Properties*. National Register Bulletin 38. National Park Service, Department of the Interior.
- Pflieger, W. L. 1997. *The fishes of Missouri*. Revised edition. Missouri Department of Conservation, Jefferson City, Missouri.
- Powell, R., R. Conant, and J. T. Collins. 2016. *Field Guide to Reptiles and Amphibians of Eastern and Central North America* (4th ed.). Houghton Mifflin Harcourt, Boston, Massachusetts.
- Pruitt, L., and L. TeWinkel. 2007. *Indiana Bat (Myotis sodalis) Draft Recovery Plan: First Revision*. U.S. Fish and Wildlife Service, Fort Snelling, Minnesota.
- Rutledge. 2016. Potentiometric surface for the Fort Payne and Tuscumbia Aquifer, Alabama. Available at <https://www.gsa.state.al.us/img/Groundwater/docs/assessment/plates/Plate99.pdf> (accessed October 2020).
- S&ME, Inc. 2021. Report of Preliminary Geotechnical Exploration, TVA Lagrande Property Site. S&ME Project No. 212482. Report submitted to TVA, Generation Projects & Fleet Services, Chattanooga, Tennessee.
- Sardis Telecom. 2020. Coverage Map. Available at <https://www.sardistel.com/coverage-map/> (accessed April 2022).
- Shea, M. 1992. Status Survey Report on *Platanthera integrilabia*. Technical Report to the United States Fish and Wildlife Service, Asheville, North Carolina.
- Southwest Green Line LRT Extension (Southwest LRT). 2015. Noise Fact Sheet. Available at [https://metro council.org/getattachment/1c8f21d0-e29a-41b2-b618-c57eb96db743/FS\\_Noise\\_SDEIS\\_20141113.aspx](https://metro council.org/getattachment/1c8f21d0-e29a-41b2-b618-c57eb96db743/FS_Noise_SDEIS_20141113.aspx) (accessed November 2020).
- Sperlins BestPlaces (SBP). 2020. Bestplaces.net climate information for Decatur, Alabama. Available at <https://www.bestplaces.net/climate/city/alabama/decatur> (accessed October 13, 2020).
- Tennessee Valley Authority. 1981. Class Review of Repetitive Actions in the 100-Year Floodplain. Federal Register 46(76): 22845-22846.
- \_\_\_\_\_. 2014. TVA Solar Photovoltaic Projects Final Programmatic Environmental Assessment. Available at [https://www.tva.gov/file\\_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/TVA%20Solar%20Photovoltaic%20Projects/PV-final%20PEA-Solar%20PV-reduced%20size.pdf](https://www.tva.gov/file_source/TVA/Site%20Content/Environment/Environmental%20Stewardship/Environmental%20Reviews/TVA%20Solar%20Photovoltaic%20Projects/PV-final%20PEA-Solar%20PV-reduced%20size.pdf) (accessed May 2020).

- \_\_\_\_\_. 2016. Bull Run Fossil Plant Landfill Final Environmental Impact Statement. Available at <https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/Bull-Run-Fossil-Plant-Landfill-Management-of-Coal-Combustion-Residuals> (accessed May 2020).
- \_\_\_\_\_. 2017a. A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities, Revision 3. Edited by G. Behel, S. Benefield, R. Brannon, C. Buttram, G. Dalton, C. Ellis, C. Henley, T. Korth, T. Giles, A. Masters, J. Melton, R. Smith, J. Turk, T. White, R. Wilson. Chattanooga, Tennessee. Available at [https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/energy/transmission/a-guide-for-environmental-protection-and-best-management-practices-for-tva-construction-and-maintenance-activities.pdf?sfvrsn=60c6b80d\\_2](https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/energy/transmission/a-guide-for-environmental-protection-and-best-management-practices-for-tva-construction-and-maintenance-activities.pdf?sfvrsn=60c6b80d_2) (accessed February 2022).
- \_\_\_\_\_. 2017b. Site Clearing and Grading Specifications. Available at [https://www.tva.gov/file\\_source/TVA/Site%20Content/Energy/Transmission/Transmission-Projects/pdf/TVA%20Site%20Clearing%20and%20Grading%20Specifications\\_July2017.pdf](https://www.tva.gov/file_source/TVA/Site%20Content/Energy/Transmission/Transmission-Projects/pdf/TVA%20Site%20Clearing%20and%20Grading%20Specifications_July2017.pdf) (accessed May 2020).
- \_\_\_\_\_. 2019a. Final 2019 Integrated Resource Plan and Final Supplemental Environmental Impact Statement. Available at <https://www.tva.gov/Environment/Environmental-Stewardship/Integrated-Resource-Plan> (accessed May 2020).
- \_\_\_\_\_. 2019b. Transmission System Vegetation Management Final Programmatic Environmental Impact Statement. Chattanooga, Tennessee. August 2019. Available at <https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/Transmission-System-Vegetation-Management-Program> (accessed November 2020).
- \_\_\_\_\_. 2020a. Natural Resource Plan 2020. Available at [https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/tva-2020-natural-resource-plan.pdf?sfvrsn=91830f7c\\_2](https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/tva-2020-natural-resource-plan.pdf?sfvrsn=91830f7c_2) (accessed March 2022).
- \_\_\_\_\_. 2020b. Current TVA Transmission System Projects. Available at <https://www.tva.gov/Energy/Transmission-System/Transmission-System-Projects> (accessed November 2020).
- \_\_\_\_\_. 2020c. Substation Lighting Guidelines. Available at [https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/energy/transmission/substation-lighting-guidelines.pdf?sfvrsn=1cbe09ab\\_2](https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/energy/transmission/substation-lighting-guidelines.pdf?sfvrsn=1cbe09ab_2) (accessed November 2020).
- \_\_\_\_\_. 2020d. TVA Heritage Database Results (Provided in August 2020).
- \_\_\_\_\_. 2022. North Alabama Utility-Scale Solar Project. Available at <https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/north-alabama-utility-scale-solar-project> (accessed on February 14, 2022).

- Tennessee Valley Archaeological Research (TVAR). 2021a. A Phase I Architectural Survey Associated with the Planned North Alabama Utility-Scale Solar Project in Lawrence County, Alabama. Prepared for TVA.
- \_\_\_\_\_. 2021b. A Phase I Archaeological Survey Associated with the Planned North Alabama Utility-Scale Solar Project in Lawrence County, Alabama. Prepared for TVA.
- \_\_\_\_\_. 2021c. A Phase I Archaeological Survey for the Tennessee Valley Authority's Reservation-Mountain Home 161 kV Transmission Line Project in Lawrence County, Alabama. Report submitted to the Tennessee Valley Authority.
- Thames, D.B. 2020. Summer Foraging Range Selection of Tri-colored Bats, *Perimyotis subflavus*. Master's Thesis, University of Tennessee.
- Turcotte, W. H. and D. L. Watts. 1999. Birds of Mississippi. University Press of Mississippi, Jackson, Mississippi.
- Tuttle, M. D. 1976a. Population ecology of the gray bat (*Myotis grisescens*): philopatry, timing, and patterns of movement, weight loss during migration, and seasonal adaptive strategies. Occasional Papers of the Museum of Natural History, University of Kansas, 54: 1-38.
- Tuttle, M. D. 1976b. Population ecology of the gray bat (*Myotis grisescens*): factors influencing growth and survival of newly volant young. Ecology 57: 587-595.
- U.S. Census Bureau (USCB). 2022a. Explore Census Data. [Online Database]. Available at <https://data.census.gov/cedsci/> (accessed March 16, 2022).
- \_\_\_\_\_. 2022b. Income and Poverty in the United States: 2020. Report Number P60-273. Available at <https://www.census.gov/library/publications/2021/demo/p60-273.html> (accessed March 16, 2022).
- U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetland Delineation Manual. Available at <https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/4530> (accessed April 2022).
- \_\_\_\_\_. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0, ed. J. F. Berkowitz, J. S. Wakeley, R. W. Lichvar, C. V. Noble. ERDC/EL TR-12-9. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.
- U.S. Department of Agriculture (USDA). 1995. Landscape Aesthetics: A Handbook for Scenery Management. Agriculture Handbook Number 701. US Forest Service, US Department of Agriculture. Available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5412126.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5412126.pdf) (accessed September 24, 2020).
- \_\_\_\_\_. 2019a. Web Soil Survey. Natural Resource Conservation Service, USDA. Available at <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx> (accessed September 24, 2020).



- \_\_\_\_\_. 2019b. Hydric Soils – Introduction. Available at [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/hydric/?cid=nrcs142p2\\_053961](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/hydric/?cid=nrcs142p2_053961) (accessed September 24, 2020).
- U.S. Department of Transportation (USDOT). 2015. “Construction Noise Handbook.” US Department of Transportation, Federal Highway Administration. Available at [https://www.fhwa.dot.gov/environment/noise/construction\\_noise/handbook/](https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/) (accessed November 2020).
- U.S. Environmental Protection Agency (USEPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With An Adequate Margin of Safety. Prepared By the U.S. Environmental Protection Agency Office of Noise Abatement and Control.
- \_\_\_\_\_. 2017. Ecoregions of North America. Available at <https://www.epa.gov/ecoresearch/ecoregions-north-america> (accessed August 2020).
- \_\_\_\_\_. 2020a. USEPA Greenbook. National Area and County-Level Multi-Pollutant Information. Alabama Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Available at [https://www3.epa.gov/airquality/greenbook/anayo\\_al.html](https://www3.epa.gov/airquality/greenbook/anayo_al.html) (accessed October 12, 2020).
- \_\_\_\_\_. 2020b. 2017 National Emissions Inventory (NEI) Data. Tier 2 Summaries by State/County. Available at [ftp://newftp.epa.gov/air/nei/2017/tier\\_summaries/](ftp://newftp.epa.gov/air/nei/2017/tier_summaries/) (accessed October 12, 2020).
- \_\_\_\_\_. 2020c. Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2017 (full report). Available at <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2017> (accessed October 2020).
- \_\_\_\_\_. 2020d. EJSCREEN ACS Summary Report. Available at <https://ejscreen.epa.gov/mapper/demogreportpdf.aspx?report=acs2017> (accessed August 2020).
- U.S. Fish and Wildlife Service. 1993. Recovery plan for *Aplos priceana*. Jackson, Mississippi.
- \_\_\_\_\_. 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): Second revision. U.S. Fish and Wildlife Service, Atlanta, Georgia. Available at [http://ecos.fws.gov/docs/recovery\\_plan/030320\\_2.pdf](http://ecos.fws.gov/docs/recovery_plan/030320_2.pdf) (accessed August 27, 2020).
- \_\_\_\_\_. 2007. National Bald Eagle Management Guidelines. Available at <http://www.fws.gov/northeast/ecologicalservices/pdf/NationalBaldEagleManagementGuidelines.pdf> (accessed August 27, 2020).
- \_\_\_\_\_. 2014a. Northern Long-eared Bat Interim Conference and Planning. Available at <https://www.fws.gov/northeast/virginiafield/pdf/NLEBinterimGuidance6Jan2014.pdf> (accessed August 27, 2020).

- \_\_\_\_\_. 2014b. Endangered and Threatened Wildlife and Plants; Endangered Status for *Physaria globosa* (Short's Bladderpod), *Helianthus verticillatus* (Mohr's Barbara's buttons), and *Leavenworthia crassa* (Fleshy-Fruit Gladecress). Federal Register 79: 44712-44718.
- \_\_\_\_\_. 2015. Endangered and Threatened Wildlife and Plants; Threatened Species Status for *Platanthera integrilabia* (Green pitcher plant). Federal Register 80(178): 55304-55321.
- \_\_\_\_\_. 2017. National Wetlands Inventory. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Available at <http://www.fws.gov/wetlands/> (accessed August 2020).
- \_\_\_\_\_. 2020a. iPaC – Information, Planning, and Conservation System. Trust Resources List for North Alabama Utility-Scale Solar Facility. Available at <https://ecos.fws.gov/ipac/> (accessed August 2020).
- \_\_\_\_\_. 2020b. 2020 Range-Wide Indiana Bat Survey Guidelines. Available at <https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/FINAL%20Range-wide%20IBat%20Survey%20Guidelines%203.23.20.pdf> (accessed August 27, 2020).
- U.S. Forest Service (USFS). 2020. Forest Inventory and Analysis Program. Forest Inventory EVALIDator web-application Version 1.8.0.01. St. Paul, Minnesota: U.S. Department of Agriculture, Forest Service, Northern Research Station. Available at <http://apps.fs.usda.gov/Evalidator/evalidator.jsp> (accessed September 2020).
- U.S. Geological Survey (USGS). 1936. Hillsboro Alabama 7.5-minute quadrangle.
- \_\_\_\_\_. 1987. Hydrologic Unit Maps. USGS Water Supply Paper 2294. p. 63. Available at <https://water.usgs.gov/GIS/huc.html> (accessed August 2020).
- \_\_\_\_\_. 1997. National Water Summary on Wetland Resources, State Summary Highlights. Water Supply Paper 2425. Available at <https://water.usgs.gov/nwsum/WSP2425/index.html> (accessed August 2020).
- \_\_\_\_\_. 2008. Annual Precipitation and Runoff Averages. PRISM Product. The PRISM Climate Group. Oregon State University, Corvallis, Oregon.
- \_\_\_\_\_. 2019. TopoView. Available at <https://ngmdb.usgs.gov/topoview/> (accessed May 2020).
- \_\_\_\_\_. 2020a. Sinkholes. Available at [https://www.usgs.gov/special-topic/water-science-school/science/sinkholes?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/special-topic/water-science-school/science/sinkholes?qt-science_center_objects=0#qt-science_center_objects) (accessed October 2020).
- \_\_\_\_\_. 2020b. Unified Hazard Tool. Available at <https://earthquake.usgs.gov/hazards/interactive/> (accessed October 2020).
- \_\_\_\_\_. 2020c. ShakeMap. Available at <https://pubs.usgs.gov/fs/fs-087-03/FS-087-03-508.pdf> (accessed October 2020).

- \_\_\_\_\_. 2020d. Groundwater. Available at [https://www.usgs.gov/special-topic/water-science-school/science/groundwater-what-groundwater?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/special-topic/water-science-school/science/groundwater-what-groundwater?qt-science_center_objects=0#qt-science_center_objects) (accessed October 2020).
- \_\_\_\_\_. 2020e. Science in Your Watershed – 06 Tennessee Region. Available at <https://water.usgs.gov/wsc/reg/06.html> (accessed December 2020).
- U.S. Global Change Research Program (USGCRP). 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. Available at <https://nca2018.globalchange.gov/> (accessed October 2020).
- U.S. Water Resources Council. 1978. Guidelines for Implementing Executive Order 11988, Floodplain Management. Federal Register 43(29): 6030-6054.
- West Morgan – East Lawrence Water and Sewer Authority. 2020. Available at <https://wmel.org/> (accessed April 2022).
- Whitaker, J. O. 1996. Field guide to North American Mammals. National Audubon Society. Alfred A. Knopf, New York.

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## **Appendix A – Correspondence and Supporting Information**

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## GALM License Provisions

WITNESSETH

IN CONSIDERATION OF THE MUTUAL COVENANTS HEREINAFTER STATED, THE PARTIES HERETO AGREE AS FOLLOWS:

1. **FAIRNESS.** No person shall, on the grounds of race, color, religion, sex, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be subjected to any discrimination under any program activity carried out by the licensee utilizing benefits or assets obtained by reason of the license. In conducting such programs and activities, the licensee shall comply with applicable Federal laws, regulations, and Executive Orders together with any further amendments thereto.
2. **NO AGENTS.** It is expressly understood and agreed that neither TVA nor Licensee will be considered the agent of the other for any purpose under this License. The United States, TVA, and their agents and employees undertake no obligation or duty (in tort, contract, strict liability, or otherwise) to Licensee, or any other party for any damages to property (real or personal) or personal injuries (including death) arising out of or in any way connected with the acts or omissions of Licensee or any other persons.
3. **NO THIRD PARTY BENEFICIARY.** It is understood that this License is in no way a third-party beneficiary agreement. It is entered into solely to regulate the relationship between TVA, the United States of America, and Licensee with respect to the License Premises. The parties do not intend it to create any obligations to any third parties, which are enforceable by such parties.
4. **CONGRESSIONAL INTEREST.** No member or delegate to Congress or Resident Commissioner or any officer, employee, special Government employee, or agent of TVA or Licensee shall be admitted to any share or part of this license or to any benefit that may arise therefrom, but this provision shall not be construed to extend to a corporation or unit of Government contracting for its or for the public's general benefit; nor shall Licensee offer or give, directly or indirectly, to any officer, employee, special Government employee, or agent of TVA any gift, gratuity, favor, entertainment, loan, or any other thing of monetary value, except as provided in 18 C.F.R. 1300.735-12 or -34. Breach of this provision shall constitute a material breach of this license.
5. **NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT/ARCHEOLOGICAL RESOURCES PROTECTION ACT.** Licensee shall not disturb or alter in any way the existing state of any archaeological sites, human remains, funerary objects, sacred objects, objects of cultural patrimony, or any other archaeological resources which may be discovered or identified on or under the easement area. Upon the discovery of any such items, Licensee shall immediately stop all activity in the area of the discovery, make a reasonable effort to protect such items, and notify TVA's Cultural Compliance Staff by telephone at (865) 632-3660. Licensee shall also provide written notification of such discovery to TVA, Cultural Compliance, 400 West Summit Hill Drive, WT 11-D, Knoxville, Tennessee 37902. Licensee shall not resume work in the area of the discovery until approved by TVA.
6. **PROTECTION.** Licensee shall not make or permit or suffer any member of his/her family, employees, agents, guests, or invitees to make any offensive use of the licensed premises, and shall not permit or suffer the commission of waste upon the premises by said parties. Licensee shall refrain from acts, which in the opinion of TVA have a tendency to cause undue soil erosion thereon. Licensee shall make all reasonable efforts to prevent and suppress forest, grass and other fires upon or in the vicinity of the premises, and shall refrain from the cutting or removal of any timber on the premises without proper written authorization by TVA.
7. **LIABILITY.** Licensee shall hold the United States and TVA harmless from any and all liability for personal injuries, property damage, or for loss of life or property suffered or sustained by Licensee, by any member of Licensee's family, or by any other person arising out of or in any way connected with the use or condition of the licensed premises or any means of ingress thereto or egress therefrom, including without limitation any and all liability for such injuries, damage, or loss arising out of or in any way connected with flooding, siltation, soakage, erosion, or any consequences of said conditions whether or not the result of water control projects or operations undertaken are performed by TVA. TVA reserves the right to manipulate the levels of any of its reservoirs in any manner whatsoever, and to drawdown said reservoirs at any time. TVA shall not be liable to Licensee by reason of any injury to person or property or for loss of life or property suffered or sustained in, upon, or about any of the License Premises as a result of the operations of TVA.
8. **SECTION 26a PERMITS.** This License in no way constitutes approval by TVA, within the meaning of Section 26a of the Tennessee Valley Authority Act of 1933, of any structures, utilities, or facilities constructed or to be constructed hereunder. The Licensee will not construct any structures, utilities, or facilities for which approval is required under said Section 26a until plans for such structure, utility, or facility have been submitted to TVA for approval in accordance with established procedures.
9. **PUBLIC ACCESS.** Unless specifically permitted by the terms within this license, Licensee shall not post against or otherwise take action to restrict public entry upon the licensed premises but shall permit reasonable public access over and use of the licensed premises for recreational purposes, including but not limited to hunting and fishing; provided, however, that Licensee, in accepting this condition, does not thereby waive any remedies he may have against any member of the public under state law to recover for damages to crops or property on land covered by this license. Licensee will grant TVA or its agents access across his/her property, when necessary, to conduct official TVA business. TVA reserves the right to restrict public access on certain power properties (i.e. substations). Licensed property may not be used for a paid or organized recreational activity such as camping, managed hunts or fishing tournaments. Some organized events conducted by non-profit organizations and open to the general public may be permissible through TVA's special use license procedures.  
**Motorized Vehicles:** Unless otherwise posted, use of motorized vehicles is prohibited on TVA lands except for specified licensed practices or on maintained public access roads. Licensee may not personally use or permit others to use motorized vehicles for non-agricultural or non-resource management related activities.
10. **TVA ACCESS:** TVA reserves the unrestricted right for itself, and persons authorized by it, to enter upon the premises at any time for the purpose of licensed property inspections, archaeological, historical, and cultural explorations or for any other purpose deemed necessary to carry out Agency business, without liability to Licensee.

- 11. RENTAL RATE.** TVA and licensee will determine and agree to a mutually acceptable rental rate at the time license is initiated. This rate will be based on prevailing rental rates for agricultural use in the vicinity of the licensed tract at the time of initiation. When public auctions are used to award license agreements, annual rental rates will be based on the final accepted bid during the auction. Discounts for resource enhancements and habitat management activities which may be requirements of the license will be incorporated into the annual license cost as shown in section (F) above.
- Payments:** The initial license payment amount, as shown in section (F) above, shall be due on the date the license is signed by the licensee. Payments for each succeeding full year (January 1 to December 31) shall be due as indicated on the annual invoice statement and paid in advance of any licensed activity for each calendar year. The payment amount for each full year, and initial partial year if applicable, are shown in section (F). If deemed necessary by TVA, the licensee shall pay to TVA interest on any overdue amount, at the rate payable by TVA under the Prompt Payment Act (31 U.S.C. 3901-3906). Interest shall run from the date payment is due on the invoice until the date TVA receives payment or the date remittance is postmarked, whichever is earlier. In addition to the interest charge for late payment, Licensee shall pay TVA an administrative fee of Twenty-five Dollars (\$25) for the late payment. Payment of interest and the administrative fee shall be due thirty (30) days after the date of TVA's invoice for said payment. Failure to make any payment as required by this license shall be basis for Termination for Cause (see section 9 below).
- Adjustments:** TVA reserves the right to annually review and adjust the annual license rate for this license agreement. The TVA representative will be responsible for evaluating and initiating any changes and will notify licensee in writing of any rate change on or before the 15th day of November for the next calendar year.
- Credits:** In limited circumstances, the Licensee may upon prior written approval (*Supplemental Agreement to GALM License*) of a TVA representative, conduct work on the licensed property or other TVA tracts that would be considered beneficial to TVA and/or the public as set forth in TVA's written approval. TVA may allow credits on a year to year basis which will reduce the cost of the license. Credible work may include, but is not limited to, road maintenance, drainage improvements, vegetation management or any type of 'land improvements' deemed beneficial. For approved work, the Licensee should submit to TVA documentation showing all labor and materials costs of approved activities on or before September 30 for the preceding 12 months. Credit may then be given by TVA, not to exceed the full year license cost regardless of actual cost of services. Any credits exceeding the annual license cost may be applied to the next license year.
- 12. ASSIGNMENT.** This license or any interest herein shall not be assigned, transferred, or granted by Licensee without the prior written approval of TVA. If approved, Licensee remains responsible for compliance with terms and conditions of this license. Licensee may not receive payment from any third party for use of this property without prior written approval.
- 13. TERMINATION.** TVA reserves the unqualified and unrestricted right to terminate this license to all or any part of the licensed premises at any time, without regard to payment periods, by giving written notice to Licensee.
- Compensation for Loss:** In the event of any such termination, TVA shall determine whether Licensee has sustained a loss as a result of such termination and, if TVA determines that a loss has been suffered, TVA shall determine the amount, if any, which will constitute reasonable compensation to Licensee for such loss; and Licensee agrees to accept the sum so determined as full and final compensation for such loss and shall make no other claims whatsoever for compensation except for the right to a prorated refund for unearned payment upon termination of this license by TVA as provided herein. The findings of TVA, both as to the existence of loss and what constitutes reasonable compensation, therefore shall be final and conclusive upon the parties hereto.
- Termination for Cause:** TVA further reserves the right to terminate this license at any time for noncompliance with the provisions hereof. In such event, no refund of payment or compensation for loss shall be made, and Licensee shall have no interest in any growing crops on the premises.
- Termination by Licensee:** It is agreed that Licensee shall have the right to terminate this license by submitting a written notice of termination of agreement 30 days prior to the actual date of termination. Upon any termination of this license by Licensee, TVA shall have the right to retain any or all advance payments made by Licensee.
- Alternate Termination Clause** (☒ Check box if applicable): Notwithstanding any provisions herein, TVA reserves the right to terminate this license without prior notice and without regard for financial loss of licensee.
- 14. LICENSED AREA:** This agreement gives Licensee permission to conduct vegetation management activities as listed in Section H above within areas defined in Section H and noted on attached map. This agreement gives no rights, written or implied, for vegetation management activities on TVA properties outside these designated areas.
- 15. LIVESTOCK GRAZING AND FENCING.** Where TVA approves or requires fencing, only customary farm-type fencing required to contain livestock within a pasture will be permitted on the licensed premises. The location for such fencing and the type material and construction must be approved in writing by TVA prior to installation. TVA is currently phasing out all livestock grazing activities on TVA managed lands to enhance public use, water quality protection and wildlife benefits. If permanent or rotation grazing activities are discontinued, TVA reserves the right to deny future livestock activity on the properties.
- 16. POLLUTION.** Licensee shall control all emissions of pollutants that might be discharged or released directly or indirectly into the atmosphere, into any stream, lake, reservoir, watercourse, or surface or subterranean waters, or into or on the ground from any part of the easement area, in full compliance with all applicable standards and requirements relating to pollution control of any kind now in effect or hereafter established by or pursuant to federal, state, or local statutes, ordinances, codes, or regulations. To the extent permitted by law, Licensee shall indemnify, defend, and hold harmless Licensee and TVA from any and all claims, costs, or losses that may arise as a result of Licensee's breach of this provision.
- 17. NUTRIENT AND PESTICIDE MANAGEMENT.** Nutrient and pesticide applications will be in accordance with product labels. TVA reserves the right to restrict or deny use of any product based on site-specific conditions. Licensee shall not apply, store or dispose of any animal wastes, including processed municipal wastes, or associated products on TVA properties.
- Soil Testing:** (☒ Check box if applicable) Soil testing will be conducted every 5 years in accordance with recognized procedures and lime and nutrients applied in accordance with recommended rates. Copies of the soil test results will be maintained by the licensee throughout the term of the license.
- 18. COSTS OF RELOCATION.** Any relocation or adjustment of Licensee's equipment or related facilities necessitated by TVA's activities during the Term, or any Renewal Term, of this License shall be performed at the sole expense of Licensee.

- 19. IRRIGATION.** Crop irrigation is not permitted on TVA-managed lands except during periods of state-declared drought emergencies. Licensee must obtain prior written approval from TVA before installing any irrigation equipment on TVA managed lands.
- 20. RIPARIAN/SHORELINE BUFFER:** No vegetation management will be permitted within the riparian buffer, as designated on attached map, of any perennial waterbody (river, stream, wetland, etc.).
- 21. NUISANCE ANIMALS AND DEPREDATION PERMITS.** Licensee may not obtain depredation permits from State Wildlife Agencies for removal of nuisance animals on TVA properties. Licensees may not erect fencing to exclude wildlife from crops. Problems with nuisance animals are to be coordinated with TVA to determine the best course of action.
- 22. TVA APPROVED USES.** Notwithstanding any provisions herein, TVA reserves the right to approve or deny any proposed use or request for use on TVA lands. In addition, TVA must approve the use of any non-native plant species or non-conventional agricultural crops.
- 23. SOD PRODUCTION.** Sod (as a turf grass) shall not be permitted to be grown on or removed from TVA property under any circumstances.
- 24. SITE-SPECIFIC PROVISIONS.** - Licensee will manage these properties in compliance with the following practices:

#### Perennial Hay/Pasture

Grass cover will be mowed at least once annually and be maintained no lower than 3 inches in height. Hay bales must be removed from TVA properties before November 30 of each year or placed in a designated area for winter storage.

Permitted Hay/Pasture Cover (check all that apply)

☒ NWSG ☒ Clover ☒ Timothy ☒ Orchard ☒ Alfalfa ☒ Fescue ☒ Misc. mixture

☐ Other \_\_\_\_\_

Permitted Livestock (check all that apply)

☒ No livestock permitted ☐ Cattle ☐ Horses ☐ Goats/Sheep ☐ Rotational grazing required

☐ Other \_\_\_\_\_

- ☐ Tracts not having sufficient grass and/or legume cover will be established in the type grasses and/or legumes as recommended by TVA. Native warm season grasses are preferred for establishing hay cover. However, cool season grasses such as orchard grass or timothy mixed with legumes are acceptable. Bermudagrass, bahiagrass and zoysia are not be used to establish a hay crop. *Choose an item.*
- ☐ Any approved fencing must be maintained continuously by the licensee at his/her sole risk and expense to meet all TVA requirements. TVA assumes no liability or responsibility for damages caused by or to others or to fences from lake fluctuations or from any other cause.

#### Row Crop

Permitted Crops (check all that apply):

☒ Corn ☒ Sorghum ☒ Millet ☒ Soybean ☒ Wheat ☒ Rye ☒ Oats ☒ Canola ☒ Sunflower

☐ Other \_\_\_\_\_

Rotational crops are encouraged to provide habitat and wildlife food diversity and to help maintain adequate soil fertility (legume rotation).

Conventional tillage practices will only be allowed on those crop fields where soils are determined not to be highly erodible. For fields where soils have been determined to be potentially highly erodible, conservation tillage methods will be required as specified by TVA. No till farming practices are encouraged.

- ☐ No-till practices required.
- ☐ Maximum tillage depth will be \_\_\_\_\_ inches.
- ☒ Crop residue may not be removed from soil surface no more than 45 days prior to spring tillage.
- ☐ Crop residues will be maintained at the \_\_\_\_\_ percent level on fields.
- ☐ With fall tillage, green winter cover crops will be established immediately after tillage.
- ☐ Contour plowing and grassed waterways are to be utilized wherever active erosion is detected. Grassed waterways may be maintained for resource enhancement (see H above).
- ☐ Licensee will plant entire field with an annual winter cover crop (wheat or rye).
- ☐ Licensee will plant \_\_\_\_\_ acres with an annual winter cover crop (wheat or rye).

- 25. MISCELLANEOUS:** a) This Agreement is governed by and is to be construed under Federal law and to the extent not inconsistent with Federal law or to the extent that Federal law does not supply a rule of interpretation or decision as to the specific legal issue in question, the laws of the State of Tennessee without regards to its conflicts of law rules or decisions. This Agreement conveys no property rights, interest or estate in land or title to real property, and grants no exclusive license.
- b) All work conducted by Licensee is entirely at its own risk. In executing this Agreement, Licensee expressly understands and agrees that TVA makes no warranty, express or implied, to Licensee or any third party in connection with this Agreement. TVA expressly disclaims any warranty to Licensee and any third party permitted to use a TVA site under the terms of this Agreement or any means of access thereto or egress therefrom, are safe, adequate, or suitable for the purposes for which the site is intended to be used under this Agreement.
- c) A delay or omission by TVA hereto to exercise any right or power under this Agreement shall not be construed to be a waiver thereof. A waiver by TVA under this Agreement shall not be effective unless it is in writing and signed by TVA. A waiver by a party of a right under or breach of, this Agreement shall not be construed to operate as a waiver of any other or successive rights under, or breaches of, this Agreement.
- d) Licensee agrees that it does not have the power or authority to bind TVA or to assume or create any obligation or responsibility, express or implied, on TVA's part or in TVA's name, or to represent to any person or entity that it has such power or authority.
- e) The remedies provided to TVA in this Agreement are cumulative and not intended to be exclusive of any other remedies to which TVA may be entitled at equity or law. The exercise by TVA of any remedy to which it is entitled shall not preclude or hinder the exercise of any other such remedy nor constitute an election of remedies.
- f) By signing this Agreement, the Licensee and TVA acknowledge this is the entire Agreement between the parties which supersedes all other communications, either oral or written, with respect to the subject matter hereof. Neither TVA nor the Licensee will be bound by, or be liable to the other for any statement, representation, promise, inducement, or understanding not set forth herein. No amendments or modifications to this Agreement shall be valid unless mutually agreed by written Agreement executed by TVA and Licensee. Any costs incurred by either party in implementing this Agreement are the sole responsibility of that party.
- 26. SEVERABILITY.** Except where the manifest purposes of this License may thereby be materially impaired, if any of the provisions or the application hereof to any person or circumstances, shall be invalid or unenforceable, the remainder of this License, or the application of such provision or provisions to person or circumstances other than those as to whom or which it is held invalid or unenforceable, shall not be affected thereby and every provision of this License shall be valid and enforceable to the fullest extent permitted by law.
- 27. NO OFFER TO LICENSEE.** TVA has provided this License to Licensee for review. It is not an offer to License and shall not be binding unless and until it is fully executed and delivered by both parties.
- 28. ADDITIONAL PROVISIONS:**
- 1) Safety Requirements, Attachment I, which may be updated from time-to-time in TVA's sole discretion, are attached hereto and incorporated herein. Licensee shall request updated Safety Requirements annually.
  - 2) Licensee is responsible for all damages to person, property and/or equipment which are caused by Licensee, including any cost for repairs/replacement for damage to TVA property.
  - 3) Upon the termination of this Agreement, Licensee shall quit the Licensed Area and, upon direction from TVA, shall remove its property or equipment from the Licensed Area and repair any damage to the Licensed Area resulting therefrom. Any property or equipment of Licensee not removed from the Licensed Area within thirty (30) days after termination of this Agreement shall be considered abandoned by Licensee and title to such property or equipment shall pass to TVA without any consideration or, at TVA's option, such property or equipment may be removed by TVA at Licensee's sole cost and expense.
  - 4) Sections A - I above are incorporated by reference as if fully set forth as part of the agreed provisions herein.

IN WITNESS whereof, the parties have executed this instrument to be effective on the month, day and year shown in (A) above.

**LICENSEE**

By \_\_\_\_\_  
 Title \_\_\_\_\_  
 Date Signed \_\_\_\_\_

**TENNESSEE VALLEY AUTHORITY**

By \_\_\_\_\_  
 Title \_\_\_\_\_  
 Date Signed \_\_\_\_\_  
 Manager \_\_\_\_\_  
 Date Manager  
 Signed \_\_\_\_\_



## GRASSLANDS AND AGRICULTURAL LANDS MANAGEMENT LICENSEE SAFETY REQUIREMENTS

*on TVA's Power and Commercial Property*

### TVA expects you to...

- ✓ Demonstrate a commitment to safety by exhibiting positive safe behavior at all times.
- ✓ Be responsible for your actions to work safely and intervene if others demonstrate an at-risk behavior.
- ✓ Stop any work you see being performed that you believe is unsafe or at-risk to personal injury.

### Required Personal Protective Equipment (PPE)

**Hardhats** - Approved hardhats, Class E, are to be worn at all times with when working under an overhead hazard - brim facing forward. No painted or altered hardhats allowed.

**Safety glasses** - Safety glasses with fixed side shields (ASNI Z87.1) are required when:

- On-site in an area where they are required
- Working on, with and around equipment/machinery

Note: Safety glasses are not required when inside the protected cab of a tractor/vehicle as long as all the windows are in place.

**Hearing protection** - Hearing protection is required when operating combustion engine equipment and while around other noisy machinery.

### **Clothing and gloves** -

- Cut resistant gloves must be used while working on TVA property.
- General work clothes required:
  - ✓ full length trousers
  - ✓ shirts with 4 inch sleeves minimum (long sleeves as required)
  - ✓ no loose or torn clothing shall be worn
  - ✓ no loose jewelry and long hair must be tied up

### Additional Safety Requirements

**Smoking** - Smoking is not allowed within 50 feet of any TVA building or combustible or flammable area.  
(Allowed in Designated Areas Only)

**Flammable liquids** - Stored flammable liquids must be transported in an approved metal container and not exceed 5 gallon capacity.

## **ATTACHMENT 1, cont.**

**Barricades** - Licensee shall not to cross barricades of any kind.

### **Environmental Expectations**

- **Other than fuel to operate equipment** needed to carry out approved activities, all herbicides, pesticides, fertilizer, fluids, lubricants, adhesives, epoxies, paints, etc., must be approved by TVA before being brought on site and be accompanied with a ***Safety Data Sheet***. Do not leave or stage any fluids or lubricants on TVA property.
- TVA must approve, in advance, any application of herbicides, pesticides, or fertilizer.
- Storm drains must be protected at all times from equipment leaks or product container spills/leaks.

### **Equipment & Vehicle Operation**

- Licensee shall operate vehicle and equipment in a safe manner at all times.
- Licensee shall operate equipment in accordance with the manufacturer's use and safety instructions.
- While vehicles are on-site, Licensee is expected to hold a valid driver's license for any vehicle and trailer operating on site and be responsible for securing the load and observing all traffic rules and regulations.
- Mobile device operations should be avoided when possible and must be operated hands free when not avoidable.
- Licensee shall ensure that any other personnel operating the equipment have the skills and training necessary to safely operate the equipment.

### **Event Reporting**

- In the event of an injury, illness, near miss or environmental event, immediately notify your TVA site contact(s).
- Seek prompt attention from a medical professional for any injury.
- Preserve the accident or event scene after any incident, as much as possible, for further review of the accident/injury site by TVA, as may be applicable.

**Note: Failure to adhere the above-listed conditions, or to promptly report events, may result in termination of the License agreement.**





November 19, 2020

Christopher Davis  
USDA – Natural Resources Conservation Service  
3381 Skyway Drive  
Auburn, AL 36830

**Subject: Request for Farmland Conversion Impact Rating – North Alabama Utility-Scale Solar Facility, Lawrence County, AL**

Dear Mr. Davis,

HDR is working with the Tennessee Valley Authority (TVA) in the preparation of an environmental impact statement (EIS) for the proposed development of the North Alabama Utility-Scale Solar Facility. The solar photovoltaic (PV) facility would have a generating capacity of approximately 200 megawatts alternating current and is proposed for construction on approximately 1,459 acres of a 2,896-acre project site in Lawrence County, Alabama (Figure 1). In compliance with the National Environmental Policy Act (NEPA), the EIS will present a comprehensive analysis of pertinent environmental impacts, including prime or unique farmlands and an analysis of project alternatives. This letter is being submitted under the provisions of the Farmland Protection Policy Act (FPPA).

Enclosed is Form AD-1006, the Farmland Conversion Impact Rating Form, with Parts I, III, and VI completed and a map showing soil types and farmland classification of the proposed project site (Figure 2). To ensure compliance with FPPA and to support the NEPA process, TVA requests that Natural Resources Conservation Service review the enclosed project-specific information and complete Parts II, IV, and V on the enclosed Form AD-1006. TVA will provide notice when the draft EIS is available for distribution, along with a request for comments.

If you have any questions regarding this proposed project, please contact me at 256-614-9007 or [harriet.richardsonseacat@hdrinc.com](mailto:harriet.richardsonseacat@hdrinc.com) or Elizabeth Smith with TVA at [esmith14@tva.gov](mailto:esmith14@tva.gov).

Kind regards,

HDR, Inc.

Harriet L. Richardson Seacat  
*Environmental Project Manager*

Attachments: Form AD-1006 Farmland Conversion Impact Rating Form  
Figure 1: Project Location  
Figure 2: Soils Map

CC: Elizabeth Smith, TVA

<b>PART I</b> (To be completed by Federal Agency)				Date Of Land Evaluation Request			
Name of Project <b>North Alabama Utility-Scale Solar Facility</b>				Federal Agency Involved <b>Tennessee Valley Authority</b>			
Proposed Land Use <b>Solar PV Facility</b>				County and State <b>Lawrence County, Alabama</b>			
<b>PART II</b> (To be completed by NRCS)				Date Request Received By NRCS <b>11/20/2020</b>		Person Completing Form: <b>Eddie E. Davis Jr.</b>	
			<input checked="checked" type="checkbox"/> <input type="checkbox"/>				157
Corn, Wheat, Soybeans		73.3      321,274		29.2      126,544			
LESA		N/A		12/10/2020			
<b>PART III</b> (To be completed by Federal Agency)				Alternative Site Rating			
				Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				1,459			
B. Total Acres To Be Converted Indirectly				0			
C. Total Acres In Site				2,896			
				1756			
				N/A			
				1.38			
				14%			
<b>PART V</b> (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)				81.6			
<b>PART VI</b> (To be completed by Federal Agency) Site Assessment Criteria (Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)			<b>Maximum Points</b>	Site A	Site B	Site C	Site D
1. Area In Non-urban Use			(15)	15			
2. Perimeter In Non-urban Use			(10)	10			
3. Percent Of Site Being Farmed			(20)	10			
4. Protection Provided By State and Local Government			(20)	0			
5. Distance From Urban Built-up Area			(15)	15			
6. Distance To Urban Support Services			(15)	10			
7. Size Of Present Farm Unit Compared To Average			(10)	10			
8. Creation Of Non-farmable Farmland			(10)	10			
9. Availability Of Farm Support Services			(5)	3			
10. On-Farm Investments			(20)	8			
11. Effects Of Conversion On Farm Support Services			(10)	1			
12. Compatibility With Existing Agricultural Use			(10)	1			
TOTAL SITE ASSESSMENT POINTS			160	93	0	0	0
<b>PART VII</b> (To be completed by Federal Agency)							
Relative Value Of Farmland (From Part V)			100	81.6	0	0	0
Total Site Assessment (From Part VI above or local site assessment)			160	93	0	0	0
<b>TOTAL POINTS (Total of above 2 lines)</b>			260	174.6	0	0	0
Site Selected:		Date Of Selection		Was A Local Site Assessment Used?			
				YES <input type="checkbox"/> NO <input type="checkbox"/>			
Reason For Selection:							
Name of Federal agency representative completing this form:						Date:	

(See Instructions on reverse side)

Form AD-1006 (03-02)

## **STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM**

- Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, <http://fppa.nrcs.usda.gov/lesa/>.
- Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at [http://offices.usda.gov/scripts/ndISAPI.dll/oip\\_public/USA\\_map](http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map), or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

## **INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM**

*(For Federal Agency)*

**Part I:** When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

**Part III:** When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

**Part VI:** Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

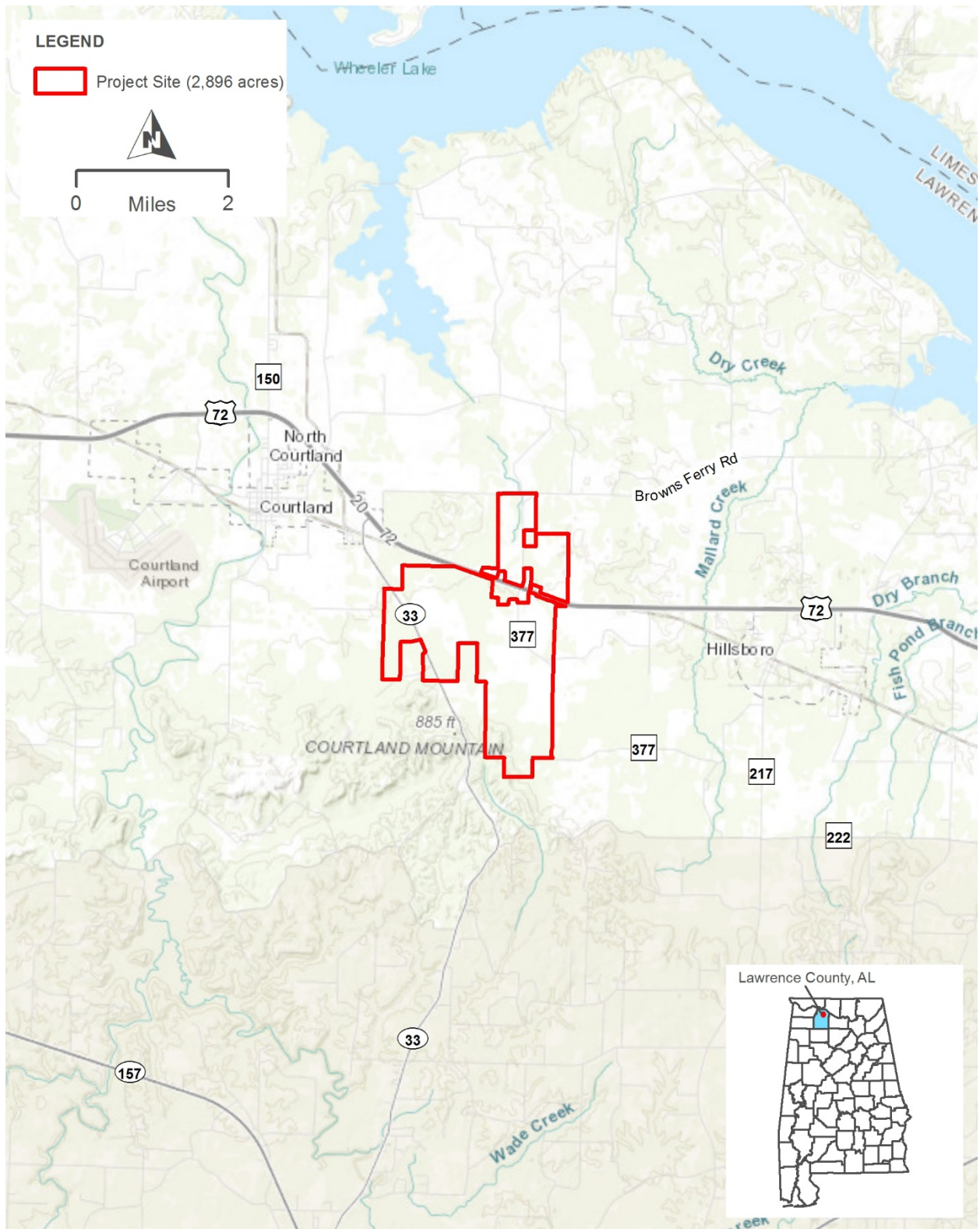
**Part VII:** In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.

Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$
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For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

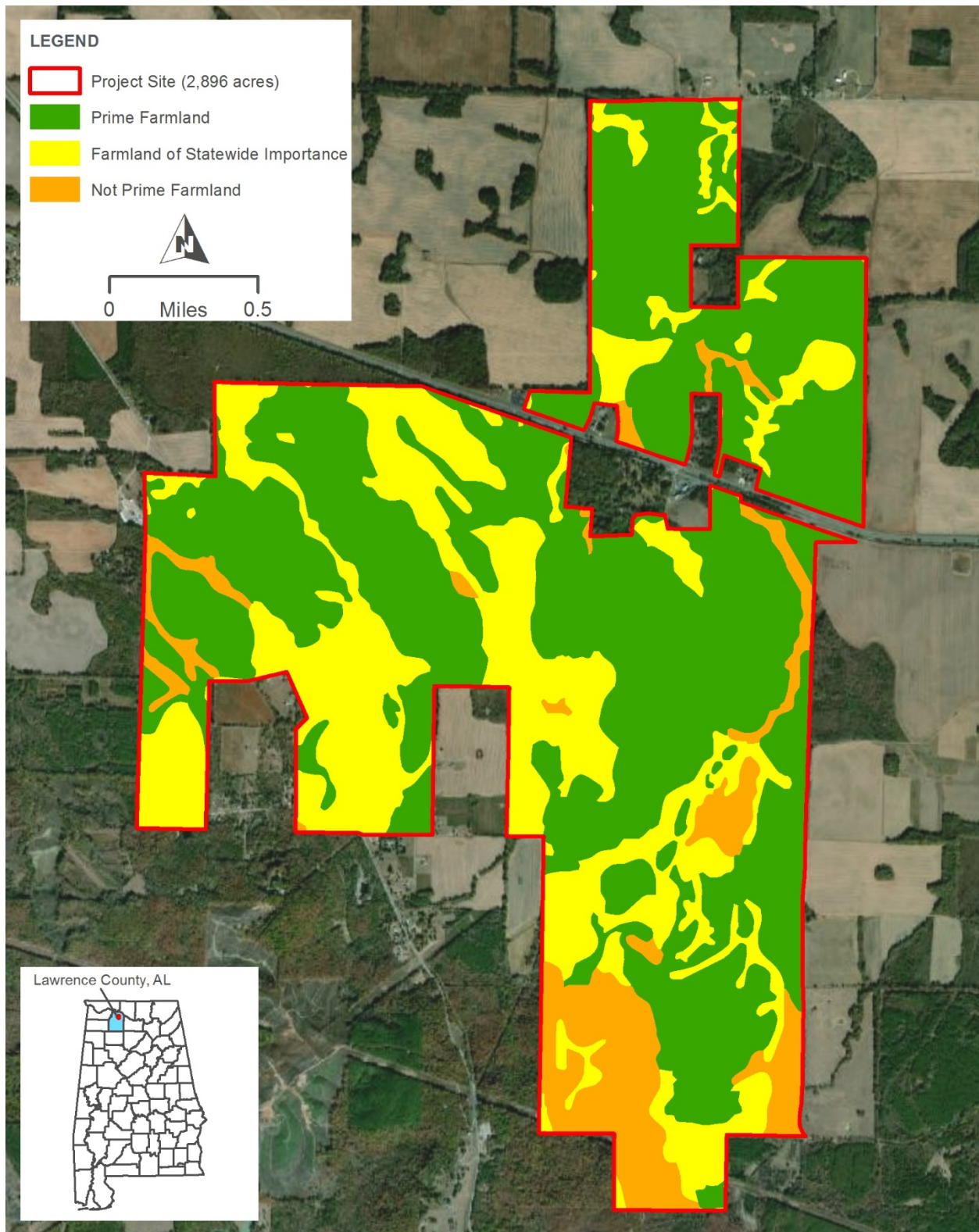
NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.



North Alabama Utility-Scale Solar Facility

Figure 1 – Project Location





North Alabama Utility-Scale Solar Facility

Figure 2 – Prime Farmland

Tennessee Valley Authority

# **Northern Alabama Large Scale Solar Project**

## **Delineation Report**

July 7, 2020

### **Prepared by:**

Schoel Engineering Company, Inc.  
1001 22nd Street South  
Birmingham, AL 35205  
205-323-6166



**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time: 1/27
Assessors/Affiliation:	Project ID:	
Site Name/Description: <u>BuA04</u>	<u>Lehrer-Solar</u>	
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal: very wet wet average dry drought unknown		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:		Source:
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe	Moderate	Slight Absent

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

Justification / Notes:

5X3, silt battery in cem field



## Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January - September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants.      <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

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# **Hydrologic Determination Field Data Sheet** Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody: <u>Wheeler Branch</u>	Date/Time:
Assessors/Affiliation:	Project ID :	
Site Name/Description: <u>BWA02</u>		
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days) :		
Precipitation this Season vs. Normal :    very wet    wet    average    dry    drought    unknown		
Source of recent & seasonal precip data :		
Watershed Size :	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology :	Source:	
Surrounding Land Use :		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) :		
Severe                      Moderate                      Slight                      Absent		

## **Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		( Stream )
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE :** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

**Justification / Notes :** 15X4, Fishy, Silt bottom

BWA03, Trib to BWA02

Put on the Ration

Put on the Ration

Put on the Ration

Put on the Ration

Put on the Ration

Total Points = \_\_\_\_\_

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

Total Points = \_\_\_\_\_

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes :**

**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time: 1/28
Assessors/Affiliation:	Project ID:	
Site Name/Description: BUNNY		
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal: very wet wet average dry drought unknown		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:	Source:	
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes): Severe Moderate Slight Absent		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

**Justification / Notes:**

1x 1, mostly DATES, Silt, BUT fish present in pools

## Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants.      <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

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**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody: <u>Red River</u>	Date/Time:
Assessors/Affiliation:	Project ID :	
Site Name/Description: <u>BLAND</u>		
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal :    very wet    wet    average    dry    drought    unknown		
Source of recent & seasonal precip data :		
Watershed Size :	Photos: Y or N (circle) Number :	
Soil Type(s) / Geology :	Source:	
Surrounding Land Use :		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) :		
Severe                      Moderate                      Slight                      Absent		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE :** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

**Justification / Notes :**

BLAND July 10 2005



## Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January - September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants.      <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

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**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time: 2/17/20
Assessors/Affiliation:		Project ID:
Site Name/Description: BUADZ		Score ONE
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal:		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:	Source:	
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe	Moderate	Slight
		Absent

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**


# Secondary Field Indicator Evaluation

Notes on the River

## A. Geomorphology (Subtotal = 11)

	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	(2)	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	(1)	2	3
4. Sorting of soil textures or other substrate	0	(1)	2	3
5. Active/relic floodplain	0	1	(2)	3
6. Depositional bars or benches	0	(1)	2	3
7. Braided channel	0	(1)	2	3
8. Recent alluvial deposits	0	(0.5)	1	1.5
9. Natural levees	(0)	(1)	2	3
10. Headcuts	0	(1)	2	3
11. Grade controls	0	(0.5)	1	1.5
12. Natural valley or drainageway	(0)	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

NA

## B. Hydrology (Subtotal = 4.5)

	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	(0)	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	(2)	3
16. Leaf litter in channel (January - September)	(1.5)	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	(1)	1.5
19. Hydric soils in stream bed or sides of channel	(No) = 0		Yes = 1.5	

## C. Biology (Subtotal = 5.5)

	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	(2)	1	0
21. Rooted plants in channel <sup>1</sup>	3	(2)	1	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	(0)	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	(1)	2	3
26. Filamentous algae, periphyton	0	(1)	2	3
27. Iron oxidizing bacteria/fungus	0	(0.5)	1	1.5
28. Wetland plants in channel <sup>2</sup>	(0)	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = 21

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : 3/2, sediment, intermitting

County:	Named Waterbody:	Date/Time:
Assessors/Affiliation:		Project ID:
Site Name/Description: <i>Burke</i>		
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal:		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:	Source:	
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe	Moderate	Slight Absent

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / ground water conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with $\geq 2$ month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Secondary Indicator Score (if applicable) =**

## LIVE, DATE

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Tacoma, WA, USA • [kiteintherain.com](http://kiteintherain.com)

# Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae, periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_  
 Under Normal Conditions, Watercourse is a Wet Weather  
 Conveyance if Secondary Indicator Score < 19 points

Notes : \_\_\_\_\_  
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**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time:
Assessors/Affiliation:		Project ID:
Site Name/Description: <u>BNA09</u>		<u>2/18/2019</u>
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal:		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:		Source:
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe      Moderate      Slight      Absent		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

Wetland drain to BNA07, Possible fish  
presence, but it was storming!



# Secondary Field Indicator Evaluation

Return to River

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_  
 Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : \_\_\_\_\_  
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County:		Named Waterbody:		Date/Time: 2/19
Assessors/Affiliation:				Project ID:
Site Name/Description: BLAD				
Site Location:				
USGS quad:		HUC (12 digit):	Lat/Long:	
Previous Rainfall (7-days):				
Precipitation this Season vs. Normal:				
Source of recent & seasonal precip data:				
Watershed Size:		Photos: Y or N (circle) Number:		
Soil Type(s) / Geology:				Source:
Surrounding Land Use:				
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):				
Severe	Moderate	Slight	Absent	

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with $\geq 2$ month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

BWA 11 is a trib to BWA12, 1X, wnc  
BWA 12 is a trib to BWA07, 2X, wnc

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# Secondary Field Indicator Evaluation

Return to River

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae: periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

County:		Named Waterbody:		Date/Time: 2/19
Assessors/Affiliation:				Project ID:
Site Name/Description: BWAIS		Solar One		
Site Location:				
USGS quad:		HUC (12 digit):		Lat/Long:
Previous Rainfall (7-days):				
Precipitation this Season vs. Normal:				
Source of recent & seasonal precip data:				
Watershed Size:			Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:				Source:
Surrounding Land Use:				
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):				
Severe		Moderate		Slight
				Absent

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with $\geq 2$ month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Secondary Indicator Score (if applicable) =**

[illegible]

# Secondary Field Indicator Evaluation

## A. Geomorphology (Subtotal = 0.5)

	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	(1)	2	3
2. Sinuous channel	(0)	1	2	3
3. In-channel structure: riffle-pool sequences	(0)	1	2	3
4. Sorting of soil textures or other substrate	(0)	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Braided channel	(0)	1	2	3
8. Recent alluvial deposits	(0)	0.5	1	1.5
9. Natural levees	(0)	1	2	3
10. Headcuts	(0)	1	2	3
11. Grade controls	0	0.5	(1)	1.5
12. Natural valley or drainageway	(0)	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

## B. Hydrology (Subtotal = 3)

	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	(1)	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January - September)	1.5	1	(0.5)	0
17. Sediment on plants or on debris	0	(0.5)	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	(1)	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

## C. Biology (Subtotal = 2.5)

	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	(1)	0
21. Rooted plants in channel <sup>1</sup>	3	2	(1)	0
22. Crayfish in stream (exclude in floodplain)	(0)	0.5	1	1.5
23. Bivalves/mussels	(0)	1	2	3
24. Amphibians	0	(0.5)	1	1.5
25. Macroinvertebrates (record type & abundance)	(0)	(1)	2	3
26. Filamentous algae; periphyton	(0)	1	2	3
27. Iron oxidizing bacteria/fungus	(0)	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	(0)	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = 8

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes: 3X < 1, Silt Substrate, water in channel but not flowing

will be that feeds forested pond

**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time:
Assessors/Affiliation:	Project ID:	
Site Name/Description: <u>BWA 32</u>		
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal:		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:	Source:	
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe	Moderate	Slight
Severe	Moderate	Absent

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

<u>3X C1 1eq 05 BWA 32</u>

*Rate in the Nation:*

10

No. 395

Total Points = \_\_\_\_\_

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

[illegible]



County:		Named Waterbody:		Date/Time:	
Assessors/Affiliation:				Project ID:	
Site Name/Description:		BNA 34			
Site Location:					
USGS quad:		HUC (12 digit):		Lat/Long:	
Previous Rainfall (7-days):					
Precipitation this Season vs. Normal:					
Source of recent & seasonal precip data:					
Watershed Size:			Photos: Y or N (circle) Number:		
Soil Type(s) / Geology:			Source:		
Surrounding Land Use:					
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):					
Severe		Moderate		Slight	
				Absent	

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with $\geq 2$ month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Secondary Indicator Score (if applicable) =**

3X < 1, silt bottom, Ag field, Partly OATs  
link

JL DARLING LLC  
Tacoma, WA, USA • [RiteintheRain.com](http://RiteintheRain.com)

Rule in the Rules:

A. Geomorphology (Subtotal = )	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )		Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0	
17. Sediment on plants or on debris	0	0.5	1	1.5	
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	
19. Hydric soils in stream bed or sides of channel	No = 0			Yes = 1.5	

C. Biology (Subtotal = )	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae, periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes :**

**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time:
Assessors/Affiliation:	Project ID:	
Site Name/Description:		
Site Location: <u>BW935</u>		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal:		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:	Source:	
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe	Moderate	Slight
Severe	Moderate	Absent

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

5X3, Fish

# Secondary Field Indicator Evaluation

*Field in the Rain*

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_  
 Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes : \_\_\_\_\_  
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**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time: 2/16/20
Assessors/Affiliation:		Project ID:
Site Name/Description: BLWA30		Solar - one
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal:		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:	Source:	
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe	Moderate	Slight Absent

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

3 < 1 WWC Flowing From Ag field into Red branch

BLWA31: some

BLWA33: continuation

BLWA34: continuation

BLWA35: 444

# Secondary Field Indicator Evaluation

Notes on the River

A. Geomorphology (Subtotal = )				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = )				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = )				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = \_\_\_\_\_  
 Under Normal Conditions, Watercourse is a Wet Weather  
 Conveyance if Secondary Indicator Score < 19 points

Notes : \_\_\_\_\_  
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**Hydrologic Determination Field Data Sheet**  
Tennessee Division of Water Pollution Control, Version 1.4

County:	Named Waterbody:	Date/Time: 3/17
Assessors/Affiliation:	Project ID:	
Site Name/Description: BWA36		
Site Location:		
USGS quad:	HUC (12 digit):	Lat/Long:
Previous Rainfall (7-days):		
Precipitation this Season vs. Normal:		
Source of recent & seasonal precip data:		
Watershed Size:	Photos: Y or N (circle) Number:	
Soil Type(s) / Geology:	Source:	
Surrounding Land Use:		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe	Moderate	Slight
Severe	Moderate	Absent

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except <i>Gambusia</i> )		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

**NOTE:** If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

**Overall Hydrologic Determination =**

**Secondary Indicator Score (if applicable) =**

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# Secondary Field Indicator Evaluation

Notes on the River

A. Geomorphology (Subtotal = 12.5)				
	Absent	Weak	Moderate	Strong
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = 4.5)				
	Absent	Weak	Moderate	Strong
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January - September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 8.5)				
	Absent	Weak	Moderate	Strong
20. Fibrous roots in channel <sup>1</sup>	3	2	1	0
21. Rooted plants in channel <sup>1</sup>	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	0.5	1	1.5
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>	0	0.5	1	1.5

<sup>1</sup> Focus is on the presence of upland plants. <sup>2</sup> Focus is on the presence of aquatic or wetland plants.

Total Points = 25.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes: 3X3, Sandy, channel in middle

BWA 37: Tris to this

## Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County:	<b>Lawrence</b>	Named Waterbody:	<b>Spring Creek</b>	Date/Time:	<b>6/16/2020</b>
Assessors/Affiliation:	<b>Schoel Engineering</b>			Project ID:	
Site Name/Description:	<b>TVA Wheeler, AL Solar Project</b>			<b>Stream_01</b>	
Site Location:	<b>Wheeler, AL</b>				
USGS quad:		HUC (12 digit):	<b>60300050105</b>	Lat/Long:	
Previous Rainfall (7-days):	<b>0.00</b>			<b>34.6341</b>	<b>-87.2596</b>
Precipitation this Season vs. Normal:	<div style="border: 2px solid red; padding: 2px;"><b>very wet</b></div>	wet	average	dry	drought      unknown
Source of recent & seasonal precip data: <b>Wunderground &amp; NOAA Research Physical Sciences Division</b>					
Watershed Size:	<b>232 acres</b>	Photos: Y or N (circle)	Number:	<b>15-22</b>	
Soil Type(s) / Geology:	<b>Dowellton silty clay loam</b>			Source: <b>USDA Soil Web</b>	
Surrounding Land Use:	<b>Farmland / forest</b>				
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):					
	<div style="border: 2px solid red; padding: 2px;"><b>Severe</b></div>	Moderate	Slight	Absent	

### Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except <i>Gambusia</i> )	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

**Note: If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

<b>Overall Hydrologic Determination =</b>	<b>Stream</b>
<b>Secondary Indicator Score (if applicable) =</b>	<b>33.0</b>

**Justification / Notes :** Stream\_01 is located in the southwest portion of the site and flows north toward the connecting roadway. The stream channel appears to be significantly oversized. Flowing water was not observed, howe the channel is dominated by pools of standing water. Tadpoles and mosquitoes were observed. Hydric soils were identified at the toe of bank slopes.

## Secondary Field Indicator Evaluation

### Stream\_01

<b>A. Geomorphology</b>	Subtotal: 20.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
1. Continuous bed and bank		0	1	2	3
2. Sinuous channel		0	1	2	3
3. In-channel structure: riffle-pool sequences		0	1	2	3
4. Sorting of soil textures or other substrate		0	1	2	3
5. Active/relict floodplain		0	1	2	3
6. Depositional bars or benches		0	1	2	3
7. Braided channel		0	1	2	3
8. Recent alluvial deposits		0	0.5	1	1.5
9. Natural levees		0	1	2	3
10. Headcuts		0	1	2	3
11. Grade controls		0	0.5	1	1.5
12. Natural valley or drainageway		0	0.5	1	1.5
13. At least second order stream on existing USGS or NRCS map		0		3	

<b>B. Hydrology</b>	Subtotal: 5.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January-September)		1.5	1	0.5	0
17. Sediment on plants or on debris		0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)		0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		0		1.5	

<b>C. Biology</b>	Subtotal: 7.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
20. Fibrous roots in channel <sup>1</sup>		3	2	1	0
21. Rooted plants in channel <sup>1</sup>		3	2	1	0
22. Crayfish in stream (exclude in floodplain)		0	0.5	1	1.5
23. Bivalves/mussels		0	1	2	3
24. Amphibians		0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)		0	1	2	3
26. Filamentous algae; periphyton		0	1	2	3
27. Iron oxidizing bacteria/fungus		0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>		0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points= 33.0**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes:**

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## Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County:	<b>Lawrence</b>	Named Waterbody:	<b>Spring Creek</b>	Date/Time:	<b>6/17/2020</b>
Assessors/Affiliation:	<b>Schoel Engineering</b>			Project ID:	
Site Name/Description:	<b>TVA Wheeler, AL Solar Project</b>			<b>Stream_02</b>	
Site Location:	<b>Wheeler, AL</b>				
USGS quad:	HUC (12 digit):	<b>60300050105</b>		Lat/Long:	
Previous Rainfall (7-days):	<b>0.00</b>			<b>34.6431 -87.2613</b>	
Precipitation this Season vs. Normal:	<div style="display: flex; justify-content: space-around; align-items: center;"> <span style="border: 2px solid red; padding: 2px;"><b>very wet</b></span> <span>wet</span> <span>average</span> <span>dry</span> <span>drought</span> <span>unknown</span> </div>				
Source of recent & seasonal precip data: <b>Wunderground &amp; NOAA Research Physical Sciences Division</b>					
Watershed Size:	<b>25 acres</b>	Photos: Y or N (circle)	Number: <b>101-103</b>		
Soil Type(s) / Geology:	<b>Dowellton silty clay loam</b>			Source: <b>USDA Soil Web</b>	
Surrounding Land Use:	<b>Farmland / forest</b>				
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):					
<div style="display: flex; justify-content: space-around; align-items: center;"> <span style="border: 2px solid red; padding: 2px;"><b>Severe</b></span> <span>Moderate</span> <span>Slight</span> <span>Absent</span> </div>					

### Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except <i>Gambusia</i> )	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

**Note: If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

<b>Overall Hydrologic Determination =</b>	<b>Wet Weather Conveyance</b>
<b>Secondary Indicator Score (if applicable) =</b>	<b>12.0</b>

**Justification / Notes :** Wet weather conveyance that drains a portion of the area south of the road connect the eastern and western portion of the site. Feature drains across the road and connects with Stream\_03.

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## Secondary Field Indicator Evaluation

Stream\_02

<b>A. Geomorphology</b>	Subtotal: 6.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
1. Continuous bed and bank		0	1	2	3
2. Sinuous channel		0	1	2	3
3. In-channel structure: riffle-pool sequences		0	1	2	3
4. Sorting of soil textures or other substrate		0	1	2	3
5. Active/relict floodplain		0	1	2	3
6. Depositional bars or benches		0	1	2	3
7. Braided channel		0	1	2	3
8. Recent alluvial deposits		0	0.5	1	1.5
9. Natural levees		0	1	2	3
10. Headcuts		0	1	2	3
11. Grade controls		0	0.5	1	1.5
12. Natural valley or drainageway		0	0.5	1	1.5
13. At least second order stream on existing USGS or NRCS map		0		3	

<b>B. Hydrology</b>	Subtotal: 1.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January-September)		1.5	1	0.5	0
17. Sediment on plants or on debris		0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)		0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		0		1.5	

<b>C. Biology</b>	Subtotal: 5.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
20. Fibrous roots in channel <sup>1</sup>		3	2	1	0
21. Rooted plants in channel <sup>1</sup>		3	2	1	0
22. Crayfish in stream (exclude in floodplain)		0	0.5	1	1.5
23. Bivalves/mussels		0	1	2	3
24. Amphibians		0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)		0	1	2	3
26. Filamentous algae; periphyton		0	1	2	3
27. Iron oxidizing bacteria/fungus		0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>		0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points= 12.0**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes:**

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## Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County:	Lawrence	Named Waterbody:	Spring Creek	Date/Time:	6/17/2020
Assessors/Affiliation:	Schoel Engineering			Project ID:	
Site Name/Description:	TVA Wheeler, AL Solar Project			Stream_03	
Site Location:	Wheeler, AL				
USGS quad:	HUC (12 digit):	60300050105		Lat/Long:	
Previous Rainfall (7-days):	0.00			34.6435	-87.261
Precipitation this Season vs. Normal:	<div style="border: 1px solid red; padding: 2px;">very wet</div> wet       average       dry       drought       unknown				
Source of recent & seasonal precip data: Wunderground & NOAA Research Physical Sciences Division					
Watershed Size:	34.6 acres	Photos: Y or N (circle)	Number: 104-107		
Soil Type(s) / Geology:	Dowellton silty clay loam			Source: USDA Soil Web	
Surrounding Land Use:	Farmland / forest				
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):					
<div style="border: 1px solid red; padding: 2px;">Severe</div> Moderate       Slight       Absent					

### Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except <i>Gambusia</i> )	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

**Note: If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination =	Stream
Secondary Indicator Score (if applicable) =	30.0

**Justification / Notes :** Stream\_03 is located downstream of Stream\_02. The stream channel appears to be significantly oversized. Flowing water was not observed, however the channel is dominated by pools of standing water. Hydric soils were identified at the toe of bank slopes.

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## Secondary Field Indicator Evaluation

Stream\_03

<b>A. Geomorphology</b>	Subtotal: 17.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
1. Continuous bed and bank		0	1	2	3
2. Sinuous channel		0	1	2	3
3. In-channel structure: riffle-pool sequences		0	1	2	3
4. Sorting of soil textures or other substrate		0	1	2	3
5. Active/relict floodplain		0	1	2	3
6. Depositional bars or benches		0	1	2	3
7. Braided channel		0	1	2	3
8. Recent alluvial deposits		0	0.5	1	1.5
9. Natural levees		0	1	2	3
10. Headcuts		0	1	2	3
11. Grade controls		0	0.5	1	1.5
12. Natural valley or drainageway		0	0.5	1	1.5
13. At least second order stream on existing USGS or NRCS map		0		3	

<b>B. Hydrology</b>	Subtotal: 5.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January-September)		1.5	1	0.5	0
17. Sediment on plants or on debris		0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)		0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		0		1.5	

<b>C. Biology</b>	Subtotal: 7.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
20. Fibrous roots in channel <sup>1</sup>		3	2	1	0
21. Rooted plants in channel <sup>1</sup>		3	2	1	0
22. Crayfish in stream (exclude in floodplain)		0	0.5	1	1.5
23. Bivalves/mussels		0	1	2	3
24. Amphibians		0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)		0	1	2	3
26. Filamentous algae; periphyton		0	1	2	3
27. Iron oxidizing bacteria/fungus		0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>		0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points= 30.0**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes:**

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## Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County:	<b>Lawrence</b>	Named Waterbody:	<b>Spring Creek</b>	Date/Time:	<b>6/24/2020</b>
Assessors/Affiliation:	<b>Schoel Engineering</b>			Project ID:	
Site Name/Description:	<b>TVA Wheeler, AL Solar Project</b>			<b>Stream_04</b>	
Site Location:	<b>Wheeler, AL</b>				
USGS quad:	HUC (12 digit):	<b>60300050105</b>		Lat/Long:	
Previous Rainfall (7-days):	<b>2.12</b>			<b>34.6433</b>	<b>-87.2597</b>
Precipitation this Season vs. Normal:	<div style="border: 2px solid red; padding: 2px;"><b>very wet</b></div>	wet	average	dry	drought    unknown
Source of recent & seasonal precip data: <b>Wunderground &amp; NOAA Research Physical Sciences Division</b>					
Watershed Size:	<b>20.4 acres</b>	Photos: Y or N (circle)	Number:	<b>147-150</b>	
Soil Type(s) / Geology:	<b>Dowellton silty clay loam</b>			Source:	<b>USDA Soil Web</b>
Surrounding Land Use:	<b>Farmland / forest</b>				
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):					
<div style="border: 2px solid red; padding: 2px;"><b>Severe</b></div>		Moderate	Slight	Absent	

### Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except <i>Gambusia</i> )	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

**Note: If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

<b>Overall Hydrologic Determination =</b>	<b>Wet Weather Conveyance</b>
<b>Secondary Indicator Score (if applicable) =</b>	<b>17.5</b>

**Justification / Notes :** Stream\_04 is located downstream of the connecting roadway and flows north to converge with Stream\_05. Flowing water was not observed within the stream channel.

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## Secondary Field Indicator Evaluation

Stream\_04

<b>A. Geomorphology</b>	Subtotal: 10.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
1. Continuous bed and bank		0	1	2	3
2. Sinuous channel		0	1	2	3
3. In-channel structure: riffle-pool sequences		0	1	2	3
4. Sorting of soil textures or other substrate		0	1	2	3
5. Active/relict floodplain		0	1	2	3
6. Depositional bars or benches		0	1	2	3
7. Braided channel		0	1	2	3
8. Recent alluvial deposits		0	0.5	1	1.5
9. Natural levees		0	1	2	3
10. Headcuts		0	1	2	3
11. Grade controls		0	0.5	1	1.5
12. Natural valley or drainageway		0	0.5	1	1.5
13. At least second order stream on existing USGS or NRCS map		0		3	

<b>B. Hydrology</b>	Subtotal: 2.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January-September)		1.5	1	0.5	0
17. Sediment on plants or on debris		0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)		0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		0		1.5	

<b>C. Biology</b>	Subtotal: 5.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
20. Fibrous roots in channel <sup>1</sup>		3	2	1	0
21. Rooted plants in channel <sup>1</sup>		3	2	1	0
22. Crayfish in stream (exclude in floodplain)		0	0.5	1	1.5
23. Bivalves/mussels		0	1	2	3
24. Amphibians		0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)		0	1	2	3
26. Filamentous algae; periphyton		0	1	2	3
27. Iron oxidizing bacteria/fungus		0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>		0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points= 17.5**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes:**

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## Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: <b>Lawrence</b>	Named Waterbody: <b>Spring Creek</b>	Date/Time: <b>6/24/2020</b>
Assessors/Affiliation: <b>Schoel Engineering</b>	Project ID: <b>Stream_05</b>	
Site Name/Description: <b>TVA Wheeler, AL Solar Project</b>		
Site Location: <b>Wheeler, AL</b>		
USGS quad:	HUC (12 digit): <b>60300050105</b>	Lat/Long:
Previous Rainfall (7-days): <b>2.12</b>		<b>34.6435 -87.2597</b>
Precipitation this Season vs. Normal:	<div style="border: 2px solid red; padding: 2px;">very wet</div> wet average dry drought unknown	
Source of recent & seasonal precip data: <b>Wunderground &amp; NOAA Research Physical Sciences Division</b>		
Watershed Size: <b>28 acres</b>	Photos: Y or N (circle) Number: <b>151-156</b>	
Soil Type(s) / Geology: <b>Dowellton silty clay loam</b>	Source: <b>USDA Soil Web</b>	
Surrounding Land Use: <b>Farmland / forest</b>		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
<div style="border: 2px solid red; padding: 2px;">Severe</div> Moderate Slight Absent		

### Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except <i>Gambusia</i> )	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

**Note: If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination =	<b>Stream</b>
Secondary Indicator Score (if applicable) =	<b>24.0</b>

**Justification / Notes :** Stream\_05 is located downstream of Stream\_04. Dense vegetative buffer was observed along the stream banks. Standing water was observed in the stream channel. Hydric soils were identified at tow of bank slopes.

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## Secondary Field Indicator Evaluation

Stream\_05

<b>A. Geomorphology</b>	Subtotal: 12.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
1. Continuous bed and bank		0	1	2	3
2. Sinuous channel		0	1	2	3
3. In-channel structure: riffle-pool sequences		0	1	2	3
4. Sorting of soil textures or other substrate		0	1	2	3
5. Active/relict floodplain		0	1	2	3
6. Depositional bars or benches		0	1	2	3
7. Braided channel		0	1	2	3
8. Recent alluvial deposits		0	0.5	1	1.5
9. Natural levees		0	1	2	3
10. Headcuts		0	1	2	3
11. Grade controls		0	0.5	1	1.5
12. Natural valley or drainageway		0	0.5	1	1.5
13. At least second order stream on existing USGS or NRCS map		0		3	

<b>B. Hydrology</b>	Subtotal: 5.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January-September)		1.5	1	0.5	0
17. Sediment on plants or on debris		0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)		0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		0		1.5	

<b>C. Biology</b>	Subtotal: 6.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
20. Fibrous roots in channel <sup>1</sup>		3	2	1	0
21. Rooted plants in channel <sup>1</sup>		3	2	1	0
22. Crayfish in stream (exclude in floodplain)		0	0.5	1	1.5
23. Bivalves/mussels		0	1	2	3
24. Amphibians		0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)		0	1	2	3
26. Filamentous algae; periphyton		0	1	2	3
27. Iron oxidizing bacteria/fungus		0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>		0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points= 24.0**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes:**

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## Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: <b>Lawrence</b>	Named Waterbody: <b>Mallard Creek</b>	Date/Time: <b>6/26/2020</b>
Assessors/Affiliation: <b>Schoel Engineering</b>	Project ID:	
Site Name/Description: <b>TVA Wheeler, AL Solar Project</b>	<b>Stream_06</b>	
Site Location: <b>Wheeler, AL</b>		
USGS quad:	HUC (12 digit): <b>60300021106</b>	Lat/Long:
Previous Rainfall (7-days): <b>3.41</b>		<b>34.6191 -87.2492</b>
Precipitation this Season vs. Normal:	<div style="border: 2px solid red; padding: 2px;">very wet</div> wet average dry drought unknown	
Source of recent & seasonal precip data: <b>Wunderground &amp; NOAA Research Physical Sciences Division</b>		
Watershed Size: <b>90 acres</b>	Photos: Y or N (circle) Number: <b>187-190</b>	
Soil Type(s) / Geology: <b>Colbert loam</b>	Source: <b>USDA Soil Web</b>	
Surrounding Land Use: <b>Farmland / forest</b>		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
<div style="border: 2px solid red; padding: 2px;">Severe</div> Moderate Slight Absent		

### Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except <i>Gambusia</i> )	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

**Note: If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination =	<b>Stream</b>
Secondary Indicator Score (if applicable) =	<b>27.0</b>

**Justification / Notes :** Stream\_06 was identified north of an existing power line access road. Significant sediment deposition was observed within the stream channel from upstream erosion. This area has been impacted significantly by timbering activities. Wetland\_04 was observed adjacent to Stream\_04.

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## Secondary Field Indicator Evaluation

Stream\_06

<b>A. Geomorphology</b>	Subtotal: 15.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
1. Continuous bed and bank		0	1	2	3
2. Sinuous channel		0	1	2	3
3. In-channel structure: riffle-pool sequences		0	1	2	3
4. Sorting of soil textures or other substrate		0	1	2	3
5. Active/relict floodplain		0	1	2	3
6. Depositional bars or benches		0	1	2	3
7. Braided channel		0	1	2	3
8. Recent alluvial deposits		0	0.5	1	1.5
9. Natural levees		0	1	2	3
10. Headcuts		0	1	2	3
11. Grade controls		0	0.5	1	1.5
12. Natural valley or drainageway		0	0.5	1	1.5
13. At least second order stream on existing USGS or NRCS map		0		3	

<b>B. Hydrology</b>	Subtotal: 5.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January-September)		1.5	1	0.5	0
17. Sediment on plants or on debris		0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)		0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		0		1.5	

<b>C. Biology</b>	Subtotal: 6.0	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
20. Fibrous roots in channel <sup>1</sup>		3	2	1	0
21. Rooted plants in channel <sup>1</sup>		3	2	1	0
22. Crayfish in stream (exclude in floodplain)		0	0.5	1	1.5
23. Bivalves/mussels		0	1	2	3
24. Amphibians		0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)		0	1	2	3
26. Filamentous algae; periphyton		0	1	2	3
27. Iron oxidizing bacteria/fungus		0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>		0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points= 27.0**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes:**

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## Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.4

County: <b>Lawrence</b>	Named Waterbody: <b>Mallard Creek</b>	Date/Time: <b>6/26/2020</b>
Assessors/Affiliation: <b>Schoel Engineering</b>	Project ID:	
Site Name/Description: <b>TVA Wheeler, AL Solar Project</b>	<b>Stream_07</b>	
Site Location: <b>Wheeler, AL</b>		
USGS quad:	HUC (12 digit): <b>60300021106</b>	Lat/Long:
Previous Rainfall (7-days): <b>3.41</b>		<b>34.6166 -87.2476</b>
Precipitation this Season vs. Normal:	<div style="border: 2px solid red; padding: 2px;">very wet</div> wet average dry drought unknown	
Source of recent & seasonal precip data: <b>Wunderground &amp; NOAA Research Physical Sciences Division</b>		
Watershed Size: <b>41 acres</b>	Photos: Y or N (circle) Number: <b>216-217</b>	
Soil Type(s) / Geology: <b>Jefferson fine sandy loam</b>	Source: <b>USDA Soil Web</b>	
Surrounding Land Use: <b>Farmland / forest</b>		
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes):		
Severe <div style="border: 2px solid red; padding: 2px; display: inline-block;">Moderate</div> Slight Absent		

### Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, dominated by upland vegetation / grass	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except <i>Gambusia</i> )	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precipitation in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

**Note: If any Primary Indicators 1-9 = "Yes", then STOP; absent directly contradictory evidence, determination is complete**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.4*

Overall Hydrologic Determination =	<b>Stream</b>
Secondary Indicator Score (if applicable) =	<b>32.5</b>

**Justification / Notes :** Stream\_07 was observed upstream of a pond constructed adjacent to the power RO  
 Flowing water was observed within the stream channel. This area has been significantly impacted by timbering activity  
 Hydric soils were identified at the toe of bank slopes. Wetland\_05 was observed adjacent to Stream\_07.

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## Secondary Field Indicator Evaluation

Stream\_07

<b>A. Geomorphology</b>	Subtotal: 18.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
1. Continuous bed and bank		0	1	2	3
2. Sinuous channel		0	1	2	3
3. In-channel structure: riffle-pool sequences		0	1	2	3
4. Sorting of soil textures or other substrate		0	1	2	3
5. Active/relict floodplain		0	1	2	3
6. Depositional bars or benches		0	1	2	3
7. Braided channel		0	1	2	3
8. Recent alluvial deposits		0	0.5	1	1.5
9. Natural levees		0	1	2	3
10. Headcuts		0	1	2	3
11. Grade controls		0	0.5	1	1.5
12. Natural valley or drainageway		0	0.5	1	1.5
13. At least second order stream on existing USGS or NRCS map		0		3	

<b>B. Hydrology</b>	Subtotal: 5.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
14. Subsurface flow/discharge into channel		0	1	2	3
15. Water in channel and >48 hours since sig. rain		0	1	2	3
16. Leaf litter in channel (January-September)		1.5	1	0.5	0
17. Sediment on plants or on debris		0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)		0	0.5	1	1.5
19. Hydric soils in stream bed or sides of channel		0		1.5	

<b>C. Biology</b>	Subtotal: 8.5	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>
20. Fibrous roots in channel <sup>1</sup>		3	2	1	0
21. Rooted plants in channel <sup>1</sup>		3	2	1	0
22. Crayfish in stream (exclude in floodplain)		0	0.5	1	1.5
23. Bivalves/mussels		0	1	2	3
24. Amphibians		0	0.5	1	1.5
25. Macroinvertebrates (record type & abundance)		0	1	2	3
26. Filamentous algae; periphyton		0	1	2	3
27. Iron oxidizing bacteria/fungus		0	0.5	1	1.5
28. Wetland plants in channel <sup>2</sup>		0	0.5	1	2

<sup>1</sup> Focus is on the presence of upland plants

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points= 32.5**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes:**

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**WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region**

**Project/Site:** N.AL. Solar Site -- South Parcel **City/County:** Wheeler/Lawrence **Sampling Date:** 17-Mar-20  
**Applicant/Owner:** TVA Purchase Option Site **State:** AL **Sampling Point:** W043a  
**Investigator(s):** Britta Lees(PWS)/F.P-Hutcheon **Section, Township, Range:** S 10 T 5S R 7W  
**Landform (hillslope, terrace, etc.):** Flat **Local relief (concave, convex, none):** concave **Slope:** 0.0% / 0.0 °  
**Subregion (LRR or MLRA):** LRR N **Lat.:** 34.62215 **Long.:** -87.24564 **Datum:** NAD83  
**Soil Map Unit Name:** Colbert Loam, Partially Hydric, Moderately well drained **NWI classification:** PFO1/4Ef

**Are climatic/hydrologic conditions on the site typical for this time of year?** Yes ☐ No ☐ (If no, explain in Remarks.)

**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ☒ No ☐

**Are Vegetation** ☐ , **Soil** ☐ , **or Hydrology** ☐ **naturally problematic?** (If needed, explain any answers in Remarks.)

**Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.**

<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
<b>Hydric Soil Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>	
<b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>	
<b>Remarks:</b> Pine plantation wetland with an abundance of sweetgum intermixed; includes linear wide wetland drain to south border of site.	

**Hydrology**

<b>Wetland Hydrology Indicators:</b>		<u>Secondary Indicators (minimum of two required)</u>	
<u>Primary Indicators (minimum of one required; check all that apply)</u>			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Drift deposits (B3)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Aquatic Fauna (B13)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-neutral Test (D5)	
<b>Field Observations:</b>			
Surface Water Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>1</u>	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

# VEGETATION (Five/Four Strata)- Use scientific names of plants.

				Sampling Point: <u>W043a</u>		
		Dominant Species?	Rel.Strat. Cover	Indicator Status		
<b>Tree Stratum</b> (Plot size: <u>50'</u> )		Absolute % Cover				
1.	<u>Pinus taeda</u>	60	<input checked="" type="checkbox"/>	66.7%	FAC	
2.	<u>Liquidambar styraciflua</u>	30	<input checked="" type="checkbox"/>	33.3%	FAC	
3.			<input type="checkbox"/>	0.0%		
4.			<input type="checkbox"/>	0.0%		
5.			<input type="checkbox"/>	0.0%		
6.			<input type="checkbox"/>	0.0%		
7.		0	<input type="checkbox"/>	0.0%		
8.		0	<input type="checkbox"/>	0.0%		
		90	= Total Cover			
<b>Sapling-Sapling/Shrub Stratum</b> (Plot size: _____ )						
1.	<u>Liquidambar styraciflua</u>	15	<input checked="" type="checkbox"/>	100.0%	FAC	
2.			<input type="checkbox"/>	0.0%		
3.			<input type="checkbox"/>	0.0%		
4.			<input type="checkbox"/>	0.0%		
5.			<input type="checkbox"/>	0.0%		
6.		0	<input type="checkbox"/>	0.0%		
7.		0	<input type="checkbox"/>	0.0%		
8.		0	<input type="checkbox"/>	0.0%		
9.		0	<input type="checkbox"/>	0.0%		
10.		0	<input type="checkbox"/>	0.0%		
		15	= Total Cover			
<b>Shrub Stratum</b> (Plot size: _____ )						
1.			<input type="checkbox"/>	0.0%		
2.			<input type="checkbox"/>	0.0%		
3.			<input type="checkbox"/>	0.0%		
4.		0	<input type="checkbox"/>	0.0%		
5.		0	<input type="checkbox"/>	0.0%		
6.		0	<input type="checkbox"/>	0.0%		
7.		0	<input type="checkbox"/>	0.0%		
		0	= Total Cover			
<b>Herb Stratum</b> (Plot size: <u>10'</u> )						
1.	<u>Allium vineale</u>	10	<input checked="" type="checkbox"/>	100.0%	FACU	
2.			<input type="checkbox"/>	0.0%		
3.			<input type="checkbox"/>	0.0%		
4.			<input type="checkbox"/>	0.0%		
5.			<input type="checkbox"/>	0.0%		
6.			<input type="checkbox"/>	0.0%		
7.			<input type="checkbox"/>	0.0%		
8.			<input type="checkbox"/>	0.0%		
9.		0	<input type="checkbox"/>	0.0%		
10.		0	<input type="checkbox"/>	0.0%		
11.		0	<input type="checkbox"/>	0.0%		
12.		0	<input type="checkbox"/>	0.0%		
		10	= Total Cover			
<b>Woody Vine Stratum</b> (Plot size: _____ )						
1.			<input type="checkbox"/>	0.0%		
2.			<input type="checkbox"/>	0.0%		
3.			<input type="checkbox"/>	0.0%		
4.			<input type="checkbox"/>	0.0%		
5.		0	<input type="checkbox"/>	0.0%		
6.		0	<input type="checkbox"/>	0.0%		
		0	= Total Cover			
<b>Dominance Test worksheet:</b>						
Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)						
Total Number of Dominant Species Across All Strata: <u>4</u> (B)						
Percent of dominant Species That Are OBL, FACW, or FAC: <u>75.0%</u> (A/B)						
<b>Prevalence Index worksheet:</b>						
Total % Cover of: _____ Multiply by: _____						
OBL species <u>0</u> x 1 = <u>0</u>						
FACW species <u>0</u> x 2 = <u>0</u>						
FAC species <u>105</u> x 3 = <u>315</u>						
FACU species <u>10</u> x 4 = <u>40</u>						
UPL species <u>0</u> x 5 = <u>0</u>						
Column Totals: <u>115</u> (A) <u>355</u> (B)						
Prevalence Index = B/A = <u>3.087</u>						
<b>Hydrophytic Vegetation Indicators:</b>						
<input type="checkbox"/> Rapid Test for Hydrophytic Vegetation						
<input checked="" type="checkbox"/> Dominance Test is > 50%						
<input type="checkbox"/> Prevalence Index is ≤ 3.0 <sup>1</sup>						
<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)						
<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)						
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.						
<b>Definition of Vegetation Strata:</b>						
<b>Four Vegetation Strata:</b>						
Tree stratum – Consists of woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.						
Sapling/shrub stratum – Consists of woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.						
Herb stratum – Consists of all herbaceous (non-woody) plants, regardless of size, and all other plants less than 3.28 ft tall.						
Woody vines – Consists of all woody vines greater than 3.28 ft in height.						
<b>Five Vegetation Strata:</b>						
Tree - Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).						
Sapling stratum – Consists of woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.						
Shrub stratum – Consists of woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.						
Herb stratum – Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody species, except woody vines, less than approximately 3 ft (1 m) in height.						
Woody vines – Consists of all woody vines, regardless of height.						
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>						
<b>Remarks: (Include photo numbers here or on a separate sheet.)</b>						

\*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

## Soil

Sampling Point: W043a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix			Redox Features					Loc <sup>2</sup>	Texture	Remarks
	Color (moist)		%	Color (moist)		%	Type <sup>1</sup>				
0-9	10YR	5/4	100							Silt Loam	
9-16	2.5Y	6/2	80	2.5YR	4/6	20	D	M		Silt Loam	

<sup>1</sup> Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains <sup>2</sup>Location: PL=Pore Lining. M=Matrix

## Hydric Soil Indicators:

- ☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ 2 cm Muck (A10) (LRR N)  
☐ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Muck Mineral (S1) (LRR N, MLRA 147, 148)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)

- ☐ Dark Surface (S7)  
☐ Polyvalue Below Surface (S8) (MLRA 147,148)  
☐ Thin Dark Surface (S9) (MLRA 147, 148)  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)  
☐ Iron-Manganese Masses (F12) (LRR N, MLRA 136)  
☐ Umbric Surface (F13) (MLRA 136, 122)  
☐ Piedmont Floodplain Soils (F19) (MLRA 148)  
☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (MLRA 147)  
☐ Coast Prairie Redox (A16) (MLRA 147,148)  
☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

<b>Site:</b> S Parcel Solar Site, Swoope Branch W043	<b>Rater(s):</b> Britta Lees/FPH	<b>Date:</b> 3/17/2020
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<b>3.00</b>	<b>3</b>
max 6 pts.	subtotal

## Metric 1. Wetland Area (size)

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☒ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Sources/assumptions for size estimate (list):

### Field Delineation

<b>8</b>	<b>11</b>
max 14 pts.	subtotal

## Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☒ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☒ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

<b>14</b>	<b>25</b>
max 30 pts.	subtotal

## Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☒ Precipitation (1) [unless BR/CM primary source (5)]
- ☒ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☒ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☒ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100-year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☒ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☒ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

Check all disturbances observed

- ☒ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other \_\_\_\_\_

<b>8</b>	<b>33</b>
max 20 pts.	subtotal

## Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☒ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

- ☐ mowing
- ☐ grazing
- ☒ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

<b>33</b>
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Site: S Parcel Solar Site, Swoope Branch W043

Rater(s): Britta Lees/FPH

Date: 3/17/2020

33

subtotal previous page

0

max 10 pts

33

subtotal

0

raw score\*

## Metric 5. Special Wetlands

\*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunks/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threaten species (10); other rare species with global rank G1\*(10), G2\*(5), G3\*(3) [\*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

2

max 20 pts.

35

subtotal

## Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☒ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other \_\_\_\_\_

6b. Horizontal (plan view) interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☒ Low (1) [BR/CM (2)]
- ☐ None (0)

6c. Coverage of invasive plants.

Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

### Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre

[For BR/CM <0.04 ha (0.1 acre)]

1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality

2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality

3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

### Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species

mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species

high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rare, threatened, or endangered species

### Mudflat and Open Water Class Quality

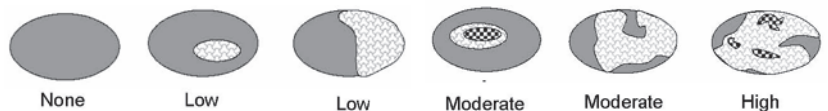
0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]

1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]

2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <0.2 ha (0.5 to 5 acre)]

3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

### Hypothetical Wetland for Estimating Degree of Interspersion



### Microtopography Cover Scale

0 = Absent

1 = Present in very small amounts or if more common of marginal quality

2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality

3 = Present in moderate or greater amounts and of highest quality

35

**GRAND TOTAL**  
(max 100 pts)

0- 29 = Category 1, low wetland function, condition, quality\*\*

30- 59 = Category 2, good/moderate wetland function, condition, quality\*\*

60-100 = Category 3, superior wetland function, condition, quality\*\*

\*\*Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: <http://www.epa.state.oh.us/dsw/401/401.html>



# North Alabama Solar Transmission Line Upgrade Wetland Memo

Date: Tuesday, February 15, 2022

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Project: North Alabama Utility-Scale Solar Facility

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To: Tennessee Valley Authority (TVA)

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From: Lyranda Thiem and Harriet Richardson Seacat, HDR, Inc.

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Subject: Summary of wetland features for the transmission line upgrades associated with the proposed North Alabama Utility-Scale Solar Facility, Lawrence County, Alabama

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Tennessee Valley Authority (TVA) proposes to construct a photovoltaic solar facility known as the North Alabama Utility-Scale Solar Facility (the Project) on approximately 2,896 acres in Lawrence County, Alabama. The Project would connect to the existing TVA Reservation–Mountain Home 161-kV transmission line (TL) and require upgrades on this TL. HDR conducted a jurisdictional waters delineation survey for wetlands in the TL upgrade areas, including TL right-of-way (ROW) and associated access routes necessary for crew and equipment access (Figure 1 and Figure 2). The TL upgrade areas are herein referred to as the “transmission line study area.”

HDR conducted the wetland survey in accordance with the standards and requirements of the U.S. Army Corps of Engineers (USACE) Nashville District (Nashville) and Executive Order 11990, *Protection of Wetlands* and followed the November 2020 TVA *Guidelines for Conducting Biological and Cultural Surveys and Impact Analyses*. Prior to the survey, HDR reviewed the U.S. Fish and Wildlife Service National Wetland Inventory, U.S. Geological Survey (USGS) National Hydrography Dataset, USGS National Land Cover Database, USGS topographic quadrangles, U.S. Department of Agriculture (USDA) Digital Elevation Models, USDA-Natural Resources Conservation Service Web Soil Survey, Federal Emergency Management Agency National Flood Hazard Layer, and publicly available recent aerial images. HDR biologists Lyranda Thiem, Michael Inman, Eric Mularski, and Jake Ivrin performed the survey on November 15 and 16, 2021.

The results of the desktop review and field survey are provided in this technical memorandum.

## 1.0 Project Area Description and Recent Weather Conditions

The transmission line study area consists of agricultural fields, ruderal forest, and maintained TVA ROW. Dominant species within the agricultural fields consist of corn (*Zea mays*). Understory cover in this vegetation community included American elm (*Ulmus americana*), red maple (*Acer rubrum*), black willow (*Salix nigra*), and sweetgum (*Liquidambar styraciflua*). Herbaceous cover in this vegetation community included soft rush (*Juncus effusus*), blunt spike rush (*Eleocharis obtusa*), angelstem beakrush (*Rhynchospora caduca*), smartweed (*Persicaria punctata*), bushy bluestem (*Andropogon glomeratus*), velvet panic grass (*Dichanthelium scoparium*), black raspberry species (*Rubus sp.*), and sunflower species (*Helianthus sp.*).





Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

December 16, 2020

Mr. Bill Pearson  
U.S. Fish and Wildlife Service  
1208 Main Street  
Daphne, Alabama 36526

Dear Mr. Pearson:

**ENDANGERED SPECIES ACT (ESA) SECTION 7 CONCURRENCE REQUEST - NORTH ALABAMA UTILITY-SCALE SOLAR FACILITY AND ASSOCIATED TRANSMISSION UPGRADES (LAWRENCE AND MORGAN COUNTY, ALABAMA)**

The Tennessee Valley Authority (TVA) is proposing to construct a utility scale solar facility on a 2,986 acre site in Lawrence County, Alabama (Figure 1). The solar arrays and other generation infrastructure would occupy about 1,459 acres of the larger parcel and would produce about 200-MW of electricity. TVA would develop the Solar Site with the intent of entering into a 20-year power purchase agreement (PPA) with a qualified company to maintain and operate the facility, while TVA would maintain ownership of the property. At the end of the PPA term, TVA would either let the PPA expire and decommission the facility or, as evaluated under separate environmental review, enter into a new PPA or choose to operate the solar PV facility for an additional period. Along with construction and development of the Solar Site, the increased generation would require upgrades to portions of two existing TVA transmission lines located in Lawrence and Morgan County, Alabama. Comprehensive field surveys have been conducted on the Solar Site, while desktop reviews have been performed for the Transmission Upgrades. The entire scope of work has not yet been defined for the Transmission Upgrades, but TVA is taking a conservative approach and assuming the maximum amount of disturbance for this type of work.

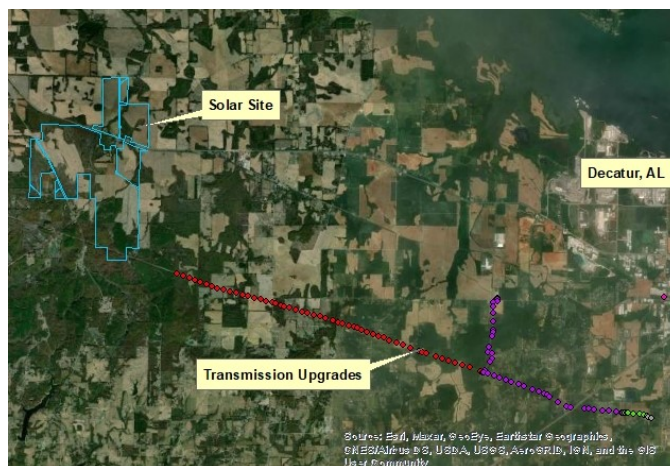


Figure 1. General vicinity of North Alabama Utility Scale Solar Project Site and Transmission Upgrades.

Review of the TVA Regional Natural Heritage database and the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) website indicates 18 species listed under the Endangered Species Act (ESA) have the potential to occur with the project area, which includes the Solar Site and the associated Transmission Upgrades. This query includes all species returned by IPaC and the following federally listed species from the TVA Regional Natural Heritage Database: 1) clams and fishes previously reported from the 10-digit HUC watershed that overlaps the project area and 2) all amphibians, birds, ferns, mammals, plants and reptiles known from Lawrence and Morgan County, Alabama.

These species include five clams (pink mucket, rough pigtoe, sheepsnose mussel, snuffbox mussel, and spectaclecase), two birds (bald eagle and red-cockaded woodpecker), two ferns (Alabama streak-sorus fern and American hart's-tongue fern), three mammals (gray bat, Indiana bat, and northern long-eared bat), and six flowering plants (fleshy-fruit gladeceess, Kral's water-plantain, leafy prairie-clover, lyrate bladderpod, Price's potato-bean, and white fringeless orchid). Designated critical habitats for fleshy-fruit gladeceess also occurs in a small portion of right-of-way (ROW) where Transmission Upgrades would occur.

TVA has determined the proposed project would have *No Effect* on the clams pink mucket, rough pigtoe, sheepsnose mussel, snuffbox mussel, and spectaclecase. These species require riverine habitat that is not present within the footprint of the Solar Site or Transmission Upgrades.

TVA has determined the proposed work would have *No Effect* on the bird species bald eagle and red-cockaded woodpecker. The closest known bald eagle nest is over eight miles distant and no bald eagle nests were documented on the Solar Site during May 2020 field reviews. All proposed project actions are in compliance with the National Bald Eagle Management Guidelines. Red-cockaded woodpeckers prefer open, mature longleaf pine forest, but will use other species of southern pine. These types of pine savanna have been eliminated from northern Alabama where the Solar Site and Transmission Upgrades would occur. No red-cockaded woodpeckers are expected to occur in the action area.

The proposed project would have *No Effect* on the fern species Alabama streak-sorus fern and American hart's-tongue fern, as well as the flowering plants Kral's water-plantain, leafy prairie-clover, lyrate bladderpod, Price's potato-bean, and white fringeless orchid. Field surveys of the Solar Site and desktop reviews of the Transmission Upgrades indicate that these plants are not present within the project area.

TVA has reached a *May Affect, Not Likely to Adversely Affect* determination for gray bat, Indiana bat and northern long-eared bat.

Armstrong Cave, located about 16 miles south of the Solar Site within the Bankhead National Forest, is the closest known gray bat, Indiana bat, and northern long-eared bat hibernacula. Historic records of gray bat and Indiana bat are known from a cave in Lauderdale County, Alabama, within ten miles of the Solar Site. This cave has been inundated by reservoir impoundment. The closest known gray bat hibernacula to the Transmission Upgrades is approximately 5.2 miles distant.

The TVA Regional Natural Heritage Database indicates that two caves have been previously reported within three miles of the Solar Site. The closest of these is approximately 1.9 miles away. Thirty-two caves are known within three miles of the Transmission Upgrades. Three of these caves are within 200 feet of the transmission line segments where work would occur; a 1947 field survey reported unidentified bat species from one of these caves. These three caves are all off the existing ROW and on private property.

May 2020 field surveys, which followed the *Range-Wide Indiana Bat Survey Guidelines*, identified summer roosting habitat for Indiana bat and northern long-eared bat on 338.3 acres of the Solar Site. This suitable habitat occurred more or less evenly across the site and included mature live hardwoods (including white oak and shagbark hickory) and snags. Approximately 83.5 acre of this suitable habitat would be removed in association with proposed actions. Based on desktop review of aerial imagery, suitable summer roosting habitat likely exists along access roads and ROWs associated with the Transmission Upgrades. A conservative, worst-case estimate indicates that up to three acres of suitable bat habitat could be removed for this portion of project work.

Suitable foraging habitat for Indiana bat and northern long-eared bat occurs throughout the forested areas on the Solar Site. Foraging habitat and sources of drinking water for all three species exist in streams, ponds, and wetlands on the Solar Site and along ROWs with proposed Transmission Upgrades.

The following avoidance and minimization measures would be implemented to avoid adverse affects to federally listed bat species:

- The solar array layout was designed to avoid impacts to wetland and streams. Best management practices would be put in place around all water bodies to minimize impacts to hydrology and water quality.
- Suitable summer roosting habitat for Indiana bat and northern long-eared bat would be removed between November 15 and March 15 when bats are not likely to be roosting out on the landscape.

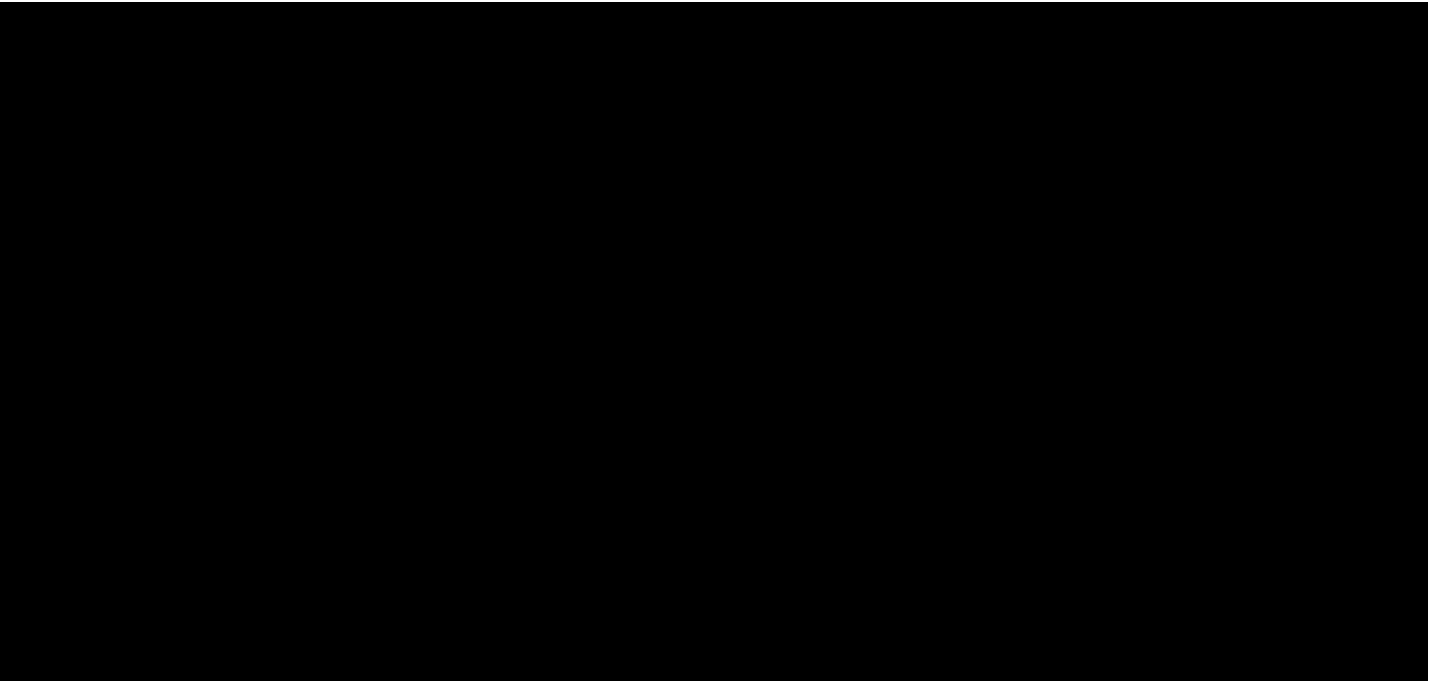
Efforts will be made to survey the three small caves within 200 feet of the Transmission Upgrades prior to proposed activities. If evidence of federally listed bats is observed in these caves or the caves cannot be surveyed and TVA assumes presence of the species, the following avoidance measure would apply:

- Drilling, blasting, or any other activity that involves continuous noise (i.e., longer than 24 hours) greater than 75 decibels measured on the A scale (e.g., loud machinery), within a 0.5 mile radius of documented winter and/or summer roosts (caves), would be conducted when bats are absent from roost sites.

The following avoidance measures would apply regardless of documented presence of federally listed bats in cave:

- Drilling or blasting within a 0.5 mile radius of documented cave would be conducted in a manner that would not compromise the structural integrity or alter the karst hydrology of the cave.
- Herbicide use would be avoided within 200 ft. of portals associated with caves capable of supporting cave-associated species. Herbicides would not be applied to surface water or wetlands unless specifically labeled for aquatic use. Filter and buffer strips would conform to federal and state regulations and label requirements.
- Clearing of vegetation within a 200 ft. radius of documented caves, if needed, would be limited to hand or small machinery (e.g., chainsaws, bush-hog, mowers). This would protect potential recharge areas of cave streams and other karst features that are connected hydrologically to caves.

TVA has reached a *May Affect, Not Likely to Adversely Affect* determination for the flowering plant fleshy-fruit gladeceess. A previously documented occurrence of the species occurs within the L5148-HT transmission line ROW [REDACTED]. This transmission segment is included in the Transmission Upgrades portion of the project. As part of routine monitoring efforts, the entire population was comprehensively mapped by the TVA botanist in April 2020, during the flowering/fruiting season. In addition to fleshy-fruit gladeceess, the Sensitive Resource Area [REDACTED] contains high-quality grassland habitat with multiple state-listed plants.



Mr. Bill Pearson  
Page 5  
December 16, 2020

While TVA does not know the exact scope of work in this Sensitive Resource Area, we can make worse case assumptions for the potential impacts of Transmission Upgrades. The proposed avoidance measures would ensure that fleshy-fruit gladeceess would not be impacted by any work project-related work needed within the Sensitive Resource Area. These avoidance measures would include:

- If practicable, design project to avoid working in the Sensitive Resource Area
- Seasonal work restriction – all construction activities would occur between May 15 and October 31 after this annual species disperses seed in the spring and before it germinates in the autumn
- Temporary fencing would be installed to exclude all construction traffic from areas supporting fleshy fruit gladeceess
- No excavation or pad construction would be used in the Sensitive Resource Area
- No permanent gravel access roads would be installed within the Sensitive Resource Area
- [REDACTED] would be accessed from the west
- [REDACTED] would be accessed from the east
- Access to [REDACTED] would be determined in the field by TVA Transmission and the TVA Botanist; the least impactful alternative would be used
- Matting would be used in wetlands to avoid construction and access related impacts
- Non-native, invasive species would not be intentionally introduced as part of any necessary revegetation efforts; only annual, species would be used for revegetation
- TVA Botanist would be on-site when avoidance measures are installed
- Fencing would be removed by the responsible TVA personnel when all project-related construction is complete

Given the extensive avoidance measures TVA plans to implement throughout the Sensitive Resource Area where flesh-fruit gladeceess occurs, and the relative resilience of the cedar glade habitat that supports it, TVA has also determined the proposed work is *Not Likely to Adversely Affect* designated critical habitat for the species. The designated critical habitat unit that intersects this project occurs wholly within the ROW and the species has presumably been present here since the transmission line was built in 1925. At this site, suitable habitat for the species is only known to occur on the transmission line ROW, which illustrates that the long-term viability of the habitat is not mutually exclusive with transmission line operation and maintenance.

We respectfully request concurrence with our determinations. Should you have any questions or wish to discuss the project in more detail, please contact Adam Dattilo at (865) 309-1645, or me at (865) 310-2336.

Sincerely,



W. Douglas White  
Manager  
Biological Compliance



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

1208-B Main Street  
Daphne, Alabama 36526

**JAN 13 2021**

IN REPLY REFER TO:

2021-I-0266

Mr. W. Douglas White  
Biological Compliance  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, Tennessee 37902

Dear Mr. White:

Thank you for your letter dated December 16, 2020, requesting our concurrence for a 2,986-acre proposed utility-scale solar facility site. The proposed solar facility is located in Lawrence County, Alabama, at the approximate center-point 34°38'50"N latitude and -87°15'38"W longitude. We understand that along with construction and development of the solar site, the increased generation would require upgrades to portions of two existing TVA transmission lines located in Lawrence and Morgan County, Alabama. We have reviewed your information and are providing the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and the Migratory Bird Treaty Act of 1918, as amended (40 Stat. 755; 16 U.S.C. 703 et seq.) (MBTA).

### **Endangered and Threatened Species**

Our review indicates that the following listed species may occur in or near the project area:

- Gray bat (*Myotis grisescens*) – Endangered
- Northern long-eared bat (*Myotis septentrionalis*) – Threatened
- Indiana bat (*Myotis sodalists*) – Endangered
- Fleshy-fruit gladeceess (*Leavenworthia crassa*) – Endangered

Suitable Indiana bat and northern long-eared bat habitat includes forests and woodlots containing potential roost trees, including live trees and/or snags > 5 inches (12.7 centimeters) and > 3 inches dbh (7.6 centimeters), respectively, that have exfoliating bark, cracks, crevices or hollows. Your letter indicates that 338.3 acres within the proposed project site is suitable summer roosting habitat for Indiana bat and northern long-eared bat.

In regards to the three bat species, we understand that the solar array layout was designed to avoid impacts to wetland and streams, best management practices would be put in place around all water



bodies to minimize impacts to hydrology and water quality, and suitable roosting habitat would be removed between November 15 and March 15 when bats are not likely to be roosting on the landscape. Avoidance and minimization measures to reduce any potential impacts to caves, will be implemented to protect any potential cave roosting bats.

In regards to the fleshy-fruit gladeceess, there is designated critical habitat that intersects the project area. *L. crassa* is a glabrous winter annual from 1 to 3 decimeters (4 to 12 inches) tall. This species is a component of glade flora and occurs in association with limestone outcroppings. A previously documented occurrence as well as critical habitat for fleshy-fruit gladeceess occurs within the project ROW and suitable habitat for the species is only known to occur on the transmission line ROW.

We understand that the following proposed avoidance measures would be in place to ensure that fleshy-fruit gladeceess would not be impacted by any work project-related work needed within the Sensitive Resource Area. We understand that these avoidance measures would include:

- If practicable, design project to avoid working in the Sensitive Resource Area
- Seasonal work restriction - all construction activities would occur between May 15 and October 31 after this annual species disperses seed in the spring and before it germinates in the autumn
- Temporary fencing would be installed to exclude all construction traffic from areas supporting fleshy fruit gladeceess
- No excavation or pad construction would be used in the Sensitive Resource Area
- No permanent gravel access roads would be installed within the Sensitive Resource Area
- Structure 273 would be accessed from the west
- Structure 275 would be accessed from the east
- Access to Structure 27 4 would be determined in the field by TVA Transmission and the TVA Botanist; the least impactful alternative would be used
- Matting would be used in wetlands to avoid construction and access related impacts
- Non-native, invasive species would not be intentionally introduced as part of any necessary revegetation efforts; only annual, species would be used for revegetation
- TVA Botanist would be on-site when avoidance measures are installed
- Fencing would be removed by the responsible TVA personnel when all project-related construction is complete

## **MBTA**

Birds to be considered when assessing potential effects of solar facilities include all protected MBTA species (50 CFR 10.13) found within the area. These include individuals that are resident, breeding, overwintering, migrating, staging, roosting, feeding, resting, and otherwise transiting through potential project areas. Particularly close attention should be paid to avian species listed in the Birds of Conservation Concern (BCC), a set of lists generated by the Service identifying migratory birds of high conservation priorities at a variety of spatial scales. The most recent BCC lists were revised in 2008 and can be accessed on-line at: <https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf>



## Best Management Practices (BMP) for Proposed Solar Facilities

The Service supports renewable energy development, but strongly encourages that it proceeds in a manner that is also protective of fish, wildlife, and habitat required by both. If this project proceeds as a solar facility, we offer the following general recommendations to minimize potential impacts to fish and wildlife resources.

- Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods, stringent sediment and erosion control measures, and minimized use of herbicides. Erosion and sedimentation controls should be installed and maintained between the construction site and any nearby, down-gradient surface waters. In addition, we recommend maintaining natural, vegetated buffers on all streams and creeks adjacent to the project site. For specific techniques and additional information regarding BMPs, see the following technical publication: “The Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas” (2018), available from the Alabama Soil and Water Conservation Committee or on-line at: <https://alconsevationdistricts.gov/resources/erosion-and-sediment-control/>.
- Consider establishing vegetative cover on the site that is beneficial to wildlife such as native warm season grasses. Based on the seed mix chosen for the vegetative cover, maintenance such as mowing may be needed. We suggest a maintenance schedule that occurs outside of nesting wildlife season and avoids maintenance between April 1 and October 1. Pesticides, fertilizers, and other chemicals should not be used in wetland areas or near streams.
- If pesticides or chemicals will be used for site maintenance, then stormwater runoff from the site should be directed to bio-retention areas prior to discharge to streams or wetlands to provide additional protection for water quality and aquatic and terrestrial wildlife habitats.
- If overhead transmission lines are present or will be installed, then measures to minimize impacts to birds should be implemented. These can include increasing line visibility, insulating wires to cover exposed connections, and increasing the distance between wires so no contact with ground or other energized wire can be made. For more information see: <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds/collisions/electric-utility-lines.php>

## Conclusion

Based upon a review of our records, our discussions with your staff, and the information provided in your letter, we concur with your determination that the project actions may affect, but are not likely to adversely affect the gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), Indiana bat (*Myotis sodalist*) and the fleshy-fruit gladeceess (*Leavenworthia crassa*) or it's critical habitat.

As long as the above BMPs and the BMPs provided in your plan are strictly adhered to, no further endangered species consultation will be required for this portion of the project unless: 1) the

identified action is subsequently modified in a manner that causes an effect on a listed species or on proposed or designated critical habitat; 2) new information reveals the identified action may affect federally protected species or designated critical habitat in a manner or to an extent not previously considered; or 3) a new species is listed or a critical habitat is designated under the Endangered Species Act that may be affected by the identified action.

We appreciate the opportunity to comment on this project and look forward to working with you in the future. If you have any questions, please contact Ms. Erin Lentz of my staff at [erin\\_lentz@fws.gov](mailto:erin_lentz@fws.gov). Please refer to the reference number located at the top of this letter in future phone calls or written correspondence.

Sincerely,

A handwritten signature in blue ink, appearing to read "William J. Pearson".

William J. Pearson  
Field Supervisor  
Alabama Ecological Services Field Office



400 West Summit Hill Drive, Knoxville, Tennessee 37902

February 10, 2022

Mr. Bill Pearson  
U.S. Fish and Wildlife Service  
1208 Main Street  
Daphne, Alabama 36526

Dear Mr. Pearson:

ENDANGERED SPECIES ACT (ESA) SECTION 7 CONCURRENCE REQUEST - NORTH ALABAMA UTILITY-SCALE SOLAR FACILITY AND ASSOCIATED TRANSMISSION UPGRADES (LAWRENCE AND MORGAN COUNTY, ALABAMA)

On December 16, 2020, the Tennessee Valley Authority (TVA) submitted a letter to your office requesting concurrence with our determinations related to the potential effects of the North Alabama Utility-Scale Solar Facility and associated transmission line upgrades on federally listed plant and animal species. Your office responded on January 13, 2021 concurring with TVA's determination that the proposed project may affect, but is not likely to adversely affect, the gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), Indiana bat (*Myotis sodalis*), and the fleshy-fruit gladeceess (*Leavenworthia crassa*) or it's critical habitat.

In the December 16, 2020 transmittal letter, TVA indicated that the entire scope of the proposed transmission upgrades had not yet been determined. Since that time, TVA has refined the scope of the proposed transmission work and has made design changes to ensure that no project-related work would occur between structures 273-275 on the L5148-HT transmission line at the previously documented fleshy-fruit gladeceess (*Leavenworthia crassa*) site. This change would eliminate the potential to affect the species or designated critical habitat at this location.

In addition, site specific field surveys of potentially effected portions of right-of-way (ROW) and associated access roads were conducted in January 2022. These field surveys indicated that nearly the entire ROW where work would occur is heavily disturbed and incapable of supporting federally listed plant species. TVA botanists did identify one small section of ROW between structures 252 and 253 that intersects an intact limestone glade (Figure 1). At this location, about 50 individual gladeceess plants were observed within the ROW where work would occur. Given the season of survey, it was not possible to determine the species of gladeceess observed. Individuals at the site could be one or more species of *Leavenworthia* that are known to occur in that region of Alabama. The previously documented population of fleshy-fruit gladeceess on the L5148-HT transmission line between structures 273-275 occurs on same ROW about 2.7 miles east southeast of this newly identified site. Seasonal field survey conducted during late March or early April would be needed to confirm the species of the newly identified population of gladeceess.



Figure 1. Sensitive Resource Area on L5148-HT where an unidentified gladeceess (*Leavenworthia* sp.) was observed during January 2022 field surveys of the proposed transmission line upgrades.

To avoid disruptions to project schedule, TVA is proposing to assume the gladeceess present between structure 252-253 on the L5148-HT transmission line is fleshy-fruit gladeceess and to implement the avoidance measures outlined in the original January 13, 2021, concurrence letter sent by your office. These proposed avoidance measures for the sensitive resource area outlined in Figure 1 include:

- Seasonal work restriction – all construction activities would occur between May 15 and October 31 after this annual species disperses seed in the spring and before it germinates in the autumn.
- Temporary fencing would be installed to exclude all construction traffic from areas supporting fleshy fruit gladeceess.
- No excavation or pad construction would be used in the Sensitive Resource Area.

Mr. Bill Pearson  
Page 3  
February 10, 2022

- No permanent gravel access roads would be installed within the Sensitive Resource Area.
- There would be no access routes through the Sensitive Resource Area.
- Non-native, invasive species would not be intentionally introduced as part of any necessary revegetation efforts; only annual, species would be used for revegetation.
- TVA Botanist would be on-site when avoidance measures are installed.
- Fencing would be removed by the responsible TVA personnel when all project-related construction is complete.

Follow-up field surveys would be conducted in late March or early April 2022 to determine if the gladeceess in the ROW is fleshy-fruit gladeceess. If the species is that federally listed taxon, avoidance measures would be implemented as outlined above. If it is not that fleshy-fruit gladeceess, TVA may elect not employ avoidance measure as outlined above. With this avoidance plan, which is identical in practice to that outlined in the original consultation package, TVA believes the proposed transmission line upgrades are not likely to adversely affect fleshy-fruit gladeceess.

Field surveys conducted in January 2022 did not result in any new information that would cause TVA to change its determinations for gray bat, northern long-eared bat, or Indiana bat. TVA continues to believe the proposed project may affect, but is not likely to adversely affect these bat species. Your office concurred with that determination in your letter dated January 13, 2021.

We respectfully request concurrence with our determination related to potential effects on fleshy-fruit gladeceess. Should you have any questions or wish to discuss the project in more detail, please contact Adam Dattilo at (865) 309-1645, or myself at (865) 310-2336.

Sincerely,



W. Douglas White  
Manager  
Biological Compliance

AJD:ABM





## United States Department of the Interior

FISH AND WILDLIFE SERVICE

1208-B Main Street  
Daphne, Alabama 36526

**FEB 25 2022**

IN REPLY REFER TO:

2022-0006436

Event: 2021-I-0266

Mr. W. Douglas White  
Biological Compliance  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, Tennessee 37902

Dear Mr. White:

Thank you for your updated letter received on February 10, 2022, requesting our concurrence for the project design changes regarding the proposed utility-scale solar facility site located in Lawrence and Morgan County, Alabama. We have reviewed your information and are providing the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and the Migratory Bird Treaty Act of 1918, as amended (40 Stat. 755; 16 U.S.C. 703 et seq.) (MBTA).

Based upon a review of our records, our discussions with your staff, and the information provided in your letters, we concur with your determination that the project actions may affect, but are not likely to adversely affect the gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), Indiana bat (*Myotis sodalist*) and the fleshy-fruit gladeceess (*Leavenworthia crassa*) or it's critical habitat.

We understand that the proposed avoidance measures outlined in the original January 13, 2021 concurrence letter would be in place to ensure that fleshy-fruit gladeceess would not be impacted by any project-related work needed if the gladeceess species identified in the ROW is determined to be fleshy-fruit gladeceess during the follow-up field surveys this spring. We look forward to receiving the survey results.

As long as the above BMPs and the BMPs provided in your plan are strictly adhered to, no further endangered species consultation will be required for this portion of the project unless: 1) the identified action is subsequently modified in a manner that causes an effect on a listed species or on proposed or designated critical habitat; 2) new information reveals the identified action may affect federally protected species or designated critical habitat in a manner or to an extent not previously considered; or 3) a new species is listed or a critical habitat is designated under the Endangered Species Act that may be affected by the identified action.

We appreciate the opportunity to comment on this project and look forward to working with you in the future. If you have any questions, please contact Ms. Erin Lentz of my staff at [erin\\_lentz@fws.gov](mailto:erin_lentz@fws.gov). Please refer to the reference number located at the top of this letter in future phone calls or written correspondence.

Sincerely,



William J. Pearson  
Field Supervisor  
Alabama Ecological Services Field Office





Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

December 19, 2019

Ms. Lee Anne Wofford  
Deputy State Historic Preservation Officer  
Alabama Historical Commission  
468 South Perry Street  
Montgomery, Alabama 36130-0900

Dear Ms. Wofford:

THE PROPOSED TENNESSEE VALLEY AUTHORITY (TVA) SOLAR ONE PROJECT,  
LAWRENCE COUNTY, ALABAMA

To diversify our generation fleet and address customer demands for cleaner energy, TVA is taking initial steps toward developing new utility scale solar. This supports TVA's 2019 Integrated Resource Plan that proposed 5 to 14 gigawatts (GW) of new solar over the next 20 years. TVA is proposing to develop a photovoltaic (PV) solar power facility, of up to 300-megawatt (MW) generating capacity. The project would interconnect to existing TVA-owned transmission lines (TL) where a portion of the TLs may need to be upgraded. The facility would be located on an assemblage of parcels making up approximately 3,000 acres owned by a single property owner 3.4 miles east of Courtland, Alabama, along Alabama Highway 20 in Lawrence County. TVA entered in an option to purchase agreement with the property owner for the assemblage of parcels, pending environmental and technical reviews including Section 106 of the National Historic Preservation Act.

TVA determined the area of potential effects (APE) to be the footprint where ground disturbance could occur as a result of the undertaking, as well as the 0.5 mile radius of the project area and within the visual line of site that may have a visual effect to historic properties (Figure 1). The survey area includes two National Register Listed Properties within the 0.5 mile viewshed (Bride's Hill and Joseph Wheeler Plantation [aka Pond Springs]). Six previously recorded archaeological sites (1LA346, 1LA663, 1LA714, 1LA793, 1LA829, and 1LA951), five cultural resources surveys, and a segment of the Trail of Tears (Deas-Whitely Route) are recorded within or in the vicinity of the project area. TVA is proposing to do a Phase I Cultural Resources survey of the APE. For your review, please find enclosed research design for the Phase I Cultural Resources survey by Tennessee Valley Archaeological Research (TVAR). Pursuant to 36 CFR § 800.4(b)(1), TVA finds that the survey design presented here is a reasonable and good faith effort to carry out identification efforts.

By this letter, TVA is initiating consultation regarding the proposed undertaking. TVA is also requesting an onsite meeting with TVA, TVAR and staff from your office.

Ms. Lee Anne Wofford  
Page 2  
December 19, 2019

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places (NRHP).

If you have any questions or comments, please contact Michaelyn Harle by telephone, (865) 632-2248 or by email, [mharle@tva.gov](mailto:mharle@tva.gov). Dr. Harle will follow up with an email regarding the proposal for an onsite meeting.

Sincerely,

A handwritten signature in black ink, appearing to read "Clinton E. Jones".

Clinton E. Jones  
Manager  
Cultural Compliance

MSH:ABM  
Enclosures



**Tennessee Valley Authority**, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

December 19, 2019

of

fficer

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Dear Sir/Madam:

THE PROPOSED TENNESSEE VALLEY AUTHORITY (TVA) SOLAR ONE PROJECT,  
LAWRENCE COUNTY, ALABAMA (34 38.570077 -87 16.073881)

To diversify our generation fleet and address customer demands for cleaner energy, TVA is taking initial steps toward developing new utility scale solar. This supports TVA's 2019 Integrated Resource Plan that proposed 5 to 14 gigawatts (GW) of new solar over the next 20 years. TVA is proposing to develop a photovoltaic (PV) solar power facility, of up to 300-megawatt (MW) generating capacity. The project would interconnect to existing TVA-owned transmission lines (TL) where a portion of the TLs may need to be upgraded. The facility would be located on an assemblage of parcels making up approximately 3,000 acres owned by a single property owner 3.4 miles east of Courtland, Alabama, along Alabama Highway 20 in Lawrence County. TVA entered in an option to purchase agreement with the property owner for the assemblage of parcels, pending environmental and technical reviews including Section 106 of the National Historic Preservation Act.

TVA determined the area of potential effects (APE) to be the footprint where ground disturbance could occur as a result of the undertaking, as well as the 0.5 mile radius of the project area and within the visual line of site that may have a visual effect to historic properties (Figure 1). The survey area includes two National Register Listed Properties within the .5 mile viewshed (Bride's Hill and Joseph Wheeler Plantation [aka Pond Springs]). Six previously recorded archaeological sites (1LA346, 1LA663, 1LA714, 1LA793, 1LA829, and 1LA951), five cultural resources surveys, and a segment of the Trail of Tears (Deas-Whitely Route) are recorded within or in the vicinity of the project area. TVA is proposing to do a Phase I Cultural Resources survey of the APE. For your review, please find enclosed research design for the Phase I Cultural Resources survey by Tennessee Valley Archaeological Research (TVAR). Pursuant to 36 CFR § 800.4(b)(1), TVA finds that the survey design presented here is a reasonable and good faith effort to carry out identification efforts.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places: Absentee Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Cherokee Nation, The Chickasaw Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Jena Band of Choctaw Indians, Kialegee Tribal Town, The Muscogee (Creek) Nation, Poarch Band of Creek Indians, The Seminole Nation of Oklahoma, Shawnee Tribe, Thlopthlocco Tribal Town, and the United Keetoowah Band of Cherokee Indians in Oklahoma.

Sir/Madam  
Page 2  
December 19, 2019

By this letter, TVA is initiating consultation regarding the proposed undertaking. Please respond by January 18, 2020 if you have any comments on the proposed undertaking. If you have any questions, please contact me by phone, (865) 632-2464, or by email, [mmshuler@tva.gov](mailto:mmshuler@tva.gov).

Sincerely,



Marianne Shuler  
Senior Specialist, Archaeologist, and Tribal Liaison  
Cultural Compliance

MSH:ABM  
Enclosures  
cc (Enclosures):

[REDACTED]  
Assistant Director of Cultural  
Preservation  
Eastern Shawnee Tribe of  
Oklahoma

[REDACTED]  
Cultural Preservation Consultant  
Shawnee Tribe

[REDACTED]  
Director, Heritage Department  
Coushatta Tribe of Louisiana

[REDACTED]  
Tribal Historic Preservation Officer  
Historic & Cultural Preservation Department  
The Muscogee (Creek) Nation

[REDACTED]  
Tribal Historic Preservation Officer  
Eastern Band of Cherokee Indians

[REDACTED]  
Section 106 Compliance  
Officer/Environmental Scientist  
United Keetoowah Band of Cherokee  
Indians in Oklahoma

March 9, 2020

Ms. Marianne Shuler, Senior Specialist,  
Archaeologist and Tribal Liaison  
Cultural Compliance  
Tennessee Valley Authority  
400 West Summit Hill Drive  
460 WT 7D-K  
Knoxville, TN 37902

Dear Ms. Shuler:

Thank you for sending proposed scope of work for the upcoming archaeological testing for the proposed development of a photovoltaic solar power facility in Lawrence County, Alabama. We wish to consult under Section 106 of the National Historic Preservation Act.

The Chickasaw Nation concurs that the procedures outlined in the scope of work should adequately test the area to identify any sites. We request to review the cultural resource survey once it is available. In addition, we are not presently aware of any specific historic properties, including those of traditional religious and cultural significance, in the project area. In the event the agency becomes aware of the need to enforce other statutes we request to be notified under ARPA, AIRFA, NEPA, NAGPRA, NHPA and Professional Standards.

Your efforts to preserve and protect significant historic properties are appreciated. If you have any questions, please contact [REDACTED]

Sincerely,

A handwritten signature in black ink, appearing to be "H. J. [unclear]", written over a black rectangular redaction box.

[REDACTED]  
Department of Culture and Humanities

cc: [mmshuler@tva.gov](mailto:mmshuler@tva.gov)





Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

September 1, 2020

Ms. Lee Anne Wofford  
Deputy State Historic Preservation Officer  
Alabama Historical Commission  
468 South Perry Street  
Montgomery, Alabama 36130-0900

Dear Ms. Wofford:

THE PROPOSED TENNESSEE VALLEY AUTHORITY'S (TVA) NORTH ALABAMA SOLAR PROJECT  
(FORMALLY, SOLAR ONE PROJECT), ARCHITECTURAL RESOURCES, LAWRENCE COUNTY,  
ALABAMA

In a letter dated December 19, 2019, TVA initiated consultation with your office regarding our proposal to develop a photovoltaic (PV) solar power facility. In our initiation of consultation letter, we stated that the solar power facility would be up to 300-megawatt (MW) generating capacity. TVA has since reduced that capacity to 200 MW. TVA determined the area of potential effects (APE) to be the footprint where ground disturbance could occur because of the undertaking, as well as the half-mile radius of the project area and within the visual line of site that may have a visual effect to historic properties.

TVA contracted with Tennessee Valley Archaeological Research (TVAR) to conduct the Phase I Cultural Resources survey. As we previously discussed, TVAR split the findings of the Phase I survey for the architectural and archaeological resources into separate reports. The results of the architectural survey titled A Phase I Architectural Survey Associated with the Planned North Alabama Utility Scale Solar Project in Lawrence County, Alabama can be downloaded.

In order to give flexibility in design and to aid in the avoidance of significant resources, TVAR based their viewshed analysis on the assumption that all tracts within the project area would be developed. Hence, TVAR's architectural survey area is larger than the actual APE. TVA used the results of both the architectural and archaeological surveys to aid in the development of the site map shown in Figure 1 identifying areas where development will be avoided. TVAR identified 24 previously recorded historic architectural resources within a half-mile buffer of the project area. Of the 24 properties, ten are no longer extant (Table 4.5 in the enclosed report). Six properties are located outside of the viewshed (Table 4.4). TVA finds that five are ineligible for listing on the National Register of Historic Places (NRHP) based on lack of integrity and/or inability to associate the structures with important persons or events and lack of architectural distinction (Table 4.3).

The remaining three previously recorded architectural resources (079-58, 079-502, and 079-503) are either listed or determined eligible for listing on the NRHP.



- Property 079-58 (Joseph Wheeler Plantation [Pond Spring Plantation]) is listed in the NRHP under Criterion B for its association with General Joseph Wheeler. Based on TVAR's onsite assessment, the proposed project would introduce a visual effect to the property, specifically from the project area on Tracts B (north and south), C (south), K, L, and M. The historic setting of this portion of the property's NRHP boundary has been visually impacted by multiple modern structures (office, warehouse, and storage facilities) associated with a private railroad-related operation. The viewshed of Tract K encompasses the southwestern portion of Pond Spring's NRHP boundary. This area, which is heavily wooded, provides a visual buffer to the property. This area, which is heavily wooded, provides a visual buffer to the property. In addition, the viewshed associated with Tract B has already been compromised by modern structures (houses, large outbuildings, and a tennis court).
- For these reasons, it is the opinion of TVAR that the project, as currently planned for Tracts B (south), C (south), K, L, and M, would introduce a visual effect to the Joe Wheeler Plantation, but the effect would not be adverse. In order to add an extra layer of visual buffer, TVA excluded portions of Tract K that are immediately adjacent to the property boundary (Figure 1). Portions of Tract B located immediately north of U.S. Highway 72 are visible to the Pond Springs grounds, including the area around the earthen mound, the pond, and the fence located in the parking area fronting the Joe Wheeler house. It is the opinion of TVAR that development in Tract B (north), specifically the southern portion of the tract located immediately north of U.S. Highway 72, would have an adverse visual effect on the unique nineteenth century built environment associated with the NRHP-listed Joseph Wheeler Plantation. In order to avoid adverse effects, TVA has provided a buffer and will avoid developing this area visible to Pond Springs (Figure 1). With the visual buffer across highway 72 in place, the only remaining portions of the PV facility that would be visible from the property are located in areas where the property's integrity of setting has already been compromised by modern development. TVA finds that the project, as currently planned, would introduce a visual effect to Pond Springs, but the effect will not be adverse. The proposed undertaking would not compromise the physical integrity of the property or diminish its architectural or historical significance, for which it is NRHP-listed.
- Property 079-502 (Bride's Hill) was listed into the NRHP as part of a thematic listing of Tidewater Cottages within the Tennessee Valley under Criterion C for their architectural significance. The property's nomination form also lists eligibility under Criteria A and B for its significance in the areas of exploration and early settlement with its establishment as a large, slave-holding cotton plantation and its early owner, Robert H. Dandridge. The viewshed encompasses both the cottage and the property's NRHP boundary. However, the historic setting of the property has been compromised by various above-ground intrusions constructed outside the property's period of significance, including two barns within the property's NRHP boundary, multiple single-family dwellings in proximity, and several above ground utilities in the area. Additionally, the proposed undertaking will not be physically located within the property's current NRHP boundary. For these reasons, TVA finds that the project, as currently planned, would introduce a visual effect to Bride's Hill, but the effect will not be adverse.
- Property 079-503 (American Store) is an early example of a rural community store and TVA finds the property eligible for the NRHP. Based on TVAR's in-field assessment, the proposed project would introduce a visual effect to the property. However, the historic setting of the

Ms. Lee Anne Wofford  
Page 3  
September 1, 2020

property has been compromised due to the proximity of multiple single-family dwellings and several above ground utilities constructed outside the property's period of significance. Furthermore, the proposed undertaking will not be physically located within the property's proposed NRHP boundary nor will it result in alteration of the property. TVA finds that the project, as currently planned, would introduce a visual effect to the American Store, but the effect will not be adverse. The proposed undertaking would not compromise the physical integrity of the property or diminish its historical significance, for which it is recommended eligible for the NRHP.

TVAR documented 14 newly recorded properties (La00001-La00014). TVA finds that 13 properties (La00002-La00014) are not eligible for the NRHP due to their lack of architectural distinction or loss of integrity resulting from modern alterations or damage. TVA finds property La00001, a segment of the former Tuscumbia, Courtland, and Decatur Railroad, eligible for NRHP listing under Criterion A for its association with the Cherokee Trail of Tears, specifically, the routes of the Deas (June 11, 1838) and Whiteley (July 21, 1838) detachments. The proposed project would introduce a visual effect to the property. However, the historic setting of the property has been compromised at various points along the proposed NRHP boundary by modern development, including expansion of U.S. Highway 72, a transmission line corridor, and several modern buildings. Furthermore, the proposed undertaking will not be physically located within the property's proposed NRHP boundary nor will it result in alteration of the railroad alignment. TVA finds that the project, as currently planned, would introduce a visual effect to the original alignment associated with Railroad, but the effect will not be adverse.

Pursuant to 36 CFR Part 800.5(c) we are notifying you of TVA's finding of no adverse effect to architectural historic properties; providing the documentation specified in § 800.11(e); and inviting you to review the finding. Also, we are seeking your agreement with TVA's eligibility determinations and finding that the undertaking as currently planned will have no adverse effects on architectural historic properties. TVA will provide a separate letter and report with the results of the archaeological survey.

Please contact Michaelyn Harle by email, [mharle@tva.gov](mailto:mharle@tva.gov) with your comments.

Sincerely,



Clinton E. Jones  
Manager  
Cultural Compliance

MSH:ABM  
Enclosures



# ALABAMA HISTORICAL COMMISSION

468 South Perry Street  
Montgomery, Alabama 36130-0900

Lisa D. Jones  
Executive Director  
State Historic Preservation Officer

Tel: 334-242-3184  
Fax: 334-242-1083

November 9, 2020

Clinton E. Jones  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, TN 37902

Re: AHC 2020-1259  
TVA North Alabama Utility Scale Solar Project (formerly Solar One)  
Architectural Assessment Report  
Lawrence County

Dear Mr. Jones:

Upon review of the architectural assessment for the above referenced undertaking by Tennessee Valley Archaeological Research, we offer the following technical comments:

- 1.) 079-58 Pond Spring (AHC owned site, NRHP-listed): We agree that the proposed undertaking will represent an adverse visual effect. Pond Spring can also be considered a cultural landscape. (<https://www.nps.gov/tps/how-to-preserve/briefs/36-cultural-landscapes.htm>)
- 2.) 079-493: We agree that this structure is not eligible for the NRHP.
- 3.) 079-496: We agree that this structure is not eligible for the NRHP.
- 4.) 079-468: We agree that this structure is not eligible for the NRHP.
- 5.) 079-502-503-504: These resources should be evaluated together since they are within the same NRHP boundary. Even if 503 and 504 aren't mentioned in the nomination, there seems to be an obvious connection. The nomination's Period of Significance could be expanded to adequately address these properties. For 502 and 503, we disagree that the properties have lost integrity of setting. It is our office's opinion that the project would be an adverse visual effect to 502, 503, and 504. This property might also be considered a cultural landscape.
- 6.) LA00001: We agree it is eligible for the NRHP; however, we disagree that the property has lost integrity of setting. This property might also be considered a cultural landscape.
- 7.) LA00002 through LA00013: We agree that these structures are not eligible for the NRHP.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Leanne Waller-Trupp at 334.230.2653 or [Leanne.Trupp@ahc.alabama.gov](mailto:Leanne.Trupp@ahc.alabama.gov). Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford  
Deputy State Historic Preservation Officer



# ALABAMA HISTORICAL COMMISSION

468 South Perry Street  
Montgomery, Alabama 36130-0900

Lisa D. Jones  
Executive Director  
State Historic Preservation Officer

Tel: 334-242-3184  
Fax: 334-242-1083

LAW/LWT/EDS/eds



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

October 2, 2020

Ms. Lee Anne Wofford  
Deputy State Historic Preservation Officer  
Alabama Historical Commission  
468 South Perry Street  
Montgomery, Alabama 36130-0900

Dear Ms. Wofford:

THE PROPOSED TENNESSEE VALLEY AUTHORITY'S (TVA) NORTH ALABAMA  
SOLAR PROJECT (FORMALLY, SOLAR ONE PROJECT), ARCHAEOLOGICAL  
RESOURCES, LAWRENCE COUNTY, ALABAMA

In a letter dated December 19, 2019, TVA initiated consultation with your office regarding our proposal to develop a photovoltaic (PV) solar power facility of up to 300-megawatt (MW) generating capacity. TVA determined the area of potential effects (APE) to be the footprint where ground disturbance could occur because of the undertaking, as well as the half-mile radius of the project area and within the visual line of site that may have a visual effect to historic properties.

TVA contracted with Tennessee Valley Archaeological Research (TVAR) to conduct the Phase I Cultural Resources survey. TVA previously provided you the results of the architectural survey. The results of the archaeological survey can be downloaded.

TVAR documented and assessed 63 archaeological sites including one previously recorded site (1LA714) and 62 newly recorded sites (1LA981-1LA1042). Of these 63 sites, 40 (1LA714, 1LA983, 1LA984, 1LA986, 1LA988, 1LA991, 1LA992, 1LA993, 1LA994, 1LA996, 1LA997, 1LA1000, 1LA1004, 1LA1005, 1LA1006, 1LA1007, 1LA1009, 1LA1010, 1LA1011, 1LA1012, 1LA1013, 1LA1017, 1LA1018, 1LA1019, 1LA1020, 1LA1021, 1LA1023, 1LA1024, 1LA1026, 1LA1027, 1LA1028, 1LA1029, 1LA1032, 1LA1033, 1LA1034, 1LA1038, 1LA1039, 1LA1040, 1LA1041, and 1LA1042) are recommended ineligible for the National Register of Historic Places (NRHP) based on lack of integrity and little research value. Seven sites (1LA982, 1LA987, 1LA999, 1LA1001, 1LA1014, 1LA1015 and 1LA1025) [REDACTED], and TVA finds that the investigated portions of these sites would not contribute to their respective resources' NRHP eligibility.

TVA finds the remaining sites potentially eligible or of undetermined eligibility for the NRHP:

- Five of these sites (1LA985, 1LA995, 1LA1008, 1LA1030 and 1LA1031) are associated with precontact occupations that have the potential to yield important information regarding the area's precontact period under Criterion D.
- Eight sites (1LA981, 1LA1002, 1LA1003, 1LA1016, 1LA1022, 1LA1035, 1LA1036, and 1LA1037) are associated with historic occupations of the area and have the potential to yield important information regarding the area's local historic period under Criterion D.
- Sites 1LA898 and 1LA990 represent several homesteads and farmsteads associated with the former community of Wheeler (also referred to as Wheeler Station). TVA finds that these two sites hold the potential for research regarding local and regional history of rural lifeways during the late 1800s and early 1900s in northern Alabama under Criterion D. Site 1LA989 also contains significant pre-contact occupation as well that is potentially eligible.
- The remaining historic site (1LA998) contains three above-ground features,

[REDACTED]. TVA finds that the site holds the potential for research regarding local and regional history of rural lifeways in northern Alabama under Criterion D.

TVAR identified three locations within the survey area that are potential sensitive cultural resource areas. These areas include one unnamed cemetery located [REDACTED], a section of bluff line containing several unevaluated rock shelters [REDACTED], and one purported [REDACTED] earthen mound [REDACTED]. Surface inspection of the agricultural field surrounding the purported mound and shovel testing in the immediate vicinity of the mound, did not produce a single [REDACTED] artifact. Based on the absence of [REDACTED] artifacts near the mound, coupled with a review of historic and modern aerial images, TVAR suggests that the mound is a possible pre-1992 push pile resulting from historic or modern land-use. TVAR suggest avoidance unless additional testing is conducted to better ascertain the age and function of the area.

In addition to the 63 archaeological sites, TVAR identified 252 non-site cultural resources (NSCR) within the survey area. Nineteen NSCRs are associated exclusively with post-1970 activities. The remaining 233 NSCRs were associated with pre-1970 activities, including pre-contact (n=125), pre-contact and historic (n=10), historic (n=88), and historic with a modern association (n=10). TVA finds that these NSCRs offer little research potential beyond the findings of the Phase I survey.

TVA will avoid all 15 archaeological sites determined eligible or undetermined for listing on NRHP and the unnamed cemetery with at least a 30-meter buffer (Figure 1). No

ground-disturbing activities will take place in connection with this undertaking inside the buffer. TVA would also avoid both the bluff line [REDACTED] and the earthen mound [REDACTED] because of their undetermined eligibility status and their respective areas being unsuitable for construction.

Although exact locations have not been identified, for some of the environmental and cultural avoidance areas shown in Figure 1, TVA is proposing to manage up to 150 acres as a species rich meadow. These restoration zones would be situated in areas that currently support row crop agriculture or in areas that have been logged by the current landowner. No forestland would be cleared to create the pollinator habitat zones and no soil disturbance is anticipated with this work. In areas that are currently in agricultural production, restoration sites would be seeded with up to 35 species of native grasses and wildflowers. Species would be selected to ensure that flowering plants are available to pollinators during as much of the growing season as possible. The restoration zones would be maintained with a combination of annual winter mowing and periodic selective application of herbicide to woody species. Where appropriately distant from solar arrays, TVA is considering prescribed fire as a management tool. The prescribed fire would not take place where above ground features were identified and any required break lines would not be cut within the boundaries of the eligible or potentially eligible sites. Pollinator restoration work in recently logged areas would rely on prescribed fire to encourage native wildflowers and grasses. If prescribed fire is required, a plan will be submitted to TVA archaeologists prior for review in order to ensure that no sensitive resources would be affected. In these areas, seeding and selective use of herbicide may be used to increase species diversity and control non-native weeds, respectively.

With the avoidance plan in place, TVA finds that proposed project would have no effect to archaeological sites eligible or potentially eligible to the NRHP. TVA also finds that proposed pollinator vegetation plan would not affect historic properties and in fact may be beneficial to the site as it minimizes the erosion that is taking place within the agricultural fields. TVA is considering entering into a 20-year Power Purchase Agreement (PPA) with a qualified company to maintain and operate the facility under the PPA. If TVA chooses this option, TVA will reopen consultation with your office.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding properties within the proposed project's APE that may be of religious and cultural significance to them and eligible for the NRHP.

Pursuant to 36 CFR Part 800.4(d)(1) we are notifying you of TVA's finding of no historic properties affected, providing the documentation specified in § 800.11(d); and inviting you to review the finding. In addition, we are seeking your agreement with TVA's eligibility determinations and finding that the undertaking as currently planned will have



Ms. Lee Anne Wofford  
Page 4  
October 2, 2020

no adverse effects on architectural historic properties. TVA will provide a separate letter and report with the results of the archaeological survey.

Please contact Michaelyn Harle by email, [mharle@tva.gov](mailto:mharle@tva.gov) with your comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Clinton E. Jones".

Clinton E. Jones  
Manager  
Cultural Compliance

MSH:ABM  
Enclosures



# ALABAMA HISTORICAL COMMISSION

468 South Perry Street  
Montgomery, Alabama 36130-0900

Lisa D. Jones  
Executive Director  
State Historic Preservation Officer

Tel: 334-242-3184  
Fax: 334-242-1083

November 9, 2020

Clinton E. Jones  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, TN 37902

Re: AHC 2021-0007  
TVA North Alabama Utility Scale Solar Project (formerly Solar One)  
Archaeological Assessment Report  
Lawrence County

Dear Mr. Jones:

Upon review of the above referenced project, we recognize the high level of effort put forth by Tennessee Valley Authority and Tennessee Valley Archaeological Research in this investigation. We offer the following technical comments:

- 1.) For all archaeological site plans in Chapters 5 and 6, please add the location of surface collection points as designated in the Appendix C, Artifact Inventory. The lack of this information makes the interpretation of site boundaries difficult, at best.
- 2.) A limited scale metal detector sweep/survey around the Civil War era artifacts at NSCR-C34, NSCR-031, and at archaeological site 1LA1025 may prove useful to determine if these artifacts are truly isolated finds, or skirmish/picket locations, which are notoriously difficult to interpret through either shovel testing and/or surface visual examination (e.g., see Geier et al. 2014).
- 3.) For late nineteenth to mid-twentieth century historical sites, it seems likely that these sites were part of the tenant system for the plantations at Pond Spring and Bride's Hill. For example, before his death, Joe Wheeler is known to have controlled over 19,000-acres surrounding Pond Spring. Although these sites may not be individually eligible for the National Register of Historic Places, they may contribute to the eligibility of the overall cultural landscape. We recommend that their eligibility be considered as part of a larger district.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Eric Sipes at 334.230.2667 or [Eric.Sipes@ahc.alabama.gov](mailto:Eric.Sipes@ahc.alabama.gov). Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford  
Deputy State Historic Preservation Officer

LAW/SGH/EDS/WJL/eds

Geier, Clarence R., Douglas D. Scott, and Lawrence E. Babits (Eds.)  
2014 From These Honored Dead: Historical Archaeology of the American Civil War. University Press of Florida, Gainesville.



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902

October 5, 2020

[REDACTED]  
Tribal Historic Preservation Officer  
Eastern Shawnee Tribe of Oklahoma  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Division of Historic Preservation  
Department of Culture & Humanities  
The Chickasaw Nation  
[REDACTED]

[REDACTED]  
Manager  
Historic & Cultural Preservation Department  
The Muscogee (Creek) Nation  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Alabama-Coushatta Tribe of Texas  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Thlopthlocco Tribal Town  
[REDACTED]

[REDACTED]  
Tribal Administrator  
Kialegee Tribal Town  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Absentee Shawnee Tribe of Indians of  
Oklahoma  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Poarch Band of Creek Indians  
Regulatory Affairs Division  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Coushatta Tribe of Louisiana  
[REDACTED]

[REDACTED]  
Interim Tribal Historic Preservation Officer  
The Seminole Nation of Oklahoma  
[REDACTED]

[REDACTED]  
Cultural Preservation Assistant  
Alabama-Quassarte Tribal Town  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Jena Band of Choctaw Indians  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Shawnee Tribe  
[REDACTED]  
[REDACTED]

[REDACTED]  
Tribal Historic Preservation Officer  
Cherokee Nation  
[REDACTED]  
[REDACTED]

[REDACTED]  
Director of Historic Preservation  
United Keetoowah Band of Cherokee  
Indians in Oklahoma  
[REDACTED]  
[REDACTED]

[REDACTED]  
Historic Preservation Specialist  
Tribal Historic Preservation Office  
Eastern Band of Cherokee Indians  
[REDACTED]  
[REDACTED]

Dear Sir/Madam:

THE PROPOSED TENNESSEE VALLEY AUTHORITY'S (TVA) NORTH ALABAMA SOLAR PROJECT (FORMALLY, SOLAR ONE PROJECT), ARCHAEOLOGICAL RESOURCES, LAWRENCE COUNTY, ALABAMA

In a letter dated December 19, 2019, TVA initiated consultation with your office regarding our proposal to develop a photovoltaic (PV) solar power facility of up to 300-megawatt (MW) generating capacity. TVA determined the area of potential effects (APE) to be the footprint where ground disturbance could occur because of the undertaking, as well as the half-mile radius of the project area and within the visual line of site that may have a visual effect to historic properties.

TVA contracted with Tennessee Valley Archaeological Research (TVAR) to conduct the Phase I Cultural Resources survey. TVA previously provided you the results of the architectural survey. The results of the archaeological survey can be downloaded in two volumes at:

[TVA NAUSS Archaeology Consultation Rpt Vol1 high res.pdf](#) and  
[TVA NAUSS Archaeology Consultation Rpt Vol2 high res.pdf](#)

TVAR documented and assessed 63 archaeological sites including one previously recorded site (1LA714) and 62 newly recorded sites (1LA981-1LA1042). Of these 63 sites, 40 (1LA714, 1LA983, 1LA984, 1LA986, 1LA988, 1LA991, 1LA992, 1LA993, 1LA994, 1LA996, 1LA997, 1LA1000, 1LA1004, 1LA1005, 1LA1006, 1LA1007, 1LA1009, 1LA1010, 1LA1011, 1LA1012, 1LA1013, 1LA1017, 1LA1018, 1LA1019, 1LA1020, 1LA1021, 1LA1023, 1LA1024, 1LA1026, 1LA1027, 1LA1028, 1LA1029, 1LA1032, 1LA1033, 1LA1034, 1LA1038, 1LA1039, 1LA1040, 1LA1041, and 1LA1042) are recommended ineligible for the National Register of Historic Places (NRHP) based on lack of integrity and little research value. Seven sites (1LA982, 1LA987, 1LA999, 1LA1001, 1LA1014, 1LA1015 and 1LA1025) [REDACTED], and TVA finds that the investigated portions of these sites would not contribute to their respective resources' NRHP eligibility.

TVA finds the remaining sites potentially eligible or of undetermined eligibility for the NRHP:

- Five of these sites (1LA985, 1LA995, 1LA1008, 1LA1030 and 1LA1031) are associated with pre-contact occupations that have the potential to yield important information regarding the area's pre-contact period under Criterion D.

- Eight sites (1LA981, 1LA1002, 1LA1003, 1LA1016, 1LA1022, 1LA1035, 1LA1036, and 1LA1037) are associated with historic occupations of the area and have the potential to yield important information regarding the area's local historic period under Criterion D.
- Sites 1LA898 and 1LA990 represent several homesteads and farmsteads associated with the former community of Wheeler (also referred to as Wheeler Station). TVA finds that these two sites hold the potential for research regarding local and regional history of rural lifeways during the late 1800s and early 1900s in northern Alabama under Criterion D. Site 1LA989 also contains significant [REDACTED] that is potentially eligible.
- The remaining historic site (1LA998) contains three above-ground features, [REDACTED]  
[REDACTED]  
[REDACTED] TVA finds that the site holds the potential for research regarding local and regional history of rural lifeways in northern Alabama under Criterion D.

TVAR identified three locations within the survey area that are potential sensitive cultural resource areas. These areas include one unnamed cemetery [REDACTED], a section of bluff line containing several unevaluated rock shelters [REDACTED], and one purported [REDACTED] earthen mound [REDACTED]. Surface inspection of the agricultural field surrounding the purported mound and shovel testing in the immediate vicinity of the mound, did not produce a single [REDACTED] artifact. Based on the absence of [REDACTED] artifacts near the mound, coupled with a review of historic and modern aerial images, TVAR suggests that the mound is a possible pre-1992 push pile resulting from historic or modern land-use. TVAR suggest avoidance unless additional testing is conducted to better ascertain the age and function of the area.

In addition to the 63 archaeological sites, TVAR identified 252 non-site cultural resources (NSCR) within the survey area. Nineteen NSCRs are associated exclusively with post-1970 activities. The remaining 233 NSCRs were associated with pre-1970 activities, including pre-contact (n=125), pre-contact and historic (n=10), historic (n=88), and historic with a modern association (n=10). TVA finds that these NSCRs offer little research potential beyond the findings of the Phase I survey.

TVA will avoid all 15 archaeological sites determined eligible or undetermined for listing on NRHP and the unnamed cemetery with at least a 30-meter buffer (Figure 1). No ground-disturbing activities will take place in connection with this undertaking inside the buffer. TVA would also avoid both the bluff line [REDACTED] and the earthen mound [REDACTED] because of their undetermined eligibility status and their respective areas being unsuitable for construction.

Although exact locations have not been identified, for some of the environmental and cultural avoidance areas shown in Figure 1, TVA is proposing to manage up to 150 acres as a species

rich meadow. These restoration zones would be situated in areas that currently support row crop agriculture or in areas that have been logged by the current landowner. No forestland would be cleared to create the pollinator habitat zones and no soil disturbance is anticipated with this work. In areas that are currently in agricultural production, restoration sites would be seeded with up to 35 species of native grasses and wildflowers. Species would be selected to ensure that flowering plants are available to pollinators during as much of the growing season as possible. The restoration zones would be maintained with a combination of annual winter mowing and periodic selective application of herbicide to woody species. Where appropriately distant from solar arrays, TVA is considering prescribed fire as a management tool. The prescribed fire would not take place where above ground features were identified and any required break lines would not be cut within the boundaries of the eligible or potentially eligible sites. Pollinator restoration work in recently logged areas would rely on prescribed fire to encourage native wildflowers and grasses. If prescribed fire is required, a plan will be submitted to TVA archaeologists prior for review in order to ensure that no sensitive resources would be affected. In these areas, seeding and selective use of herbicide may be used to increase species diversity and control non-native weeds, respectively.

With the avoidance plan in place, TVA finds that proposed project would have no effect to archaeological sites eligible or potentially eligible to the NRHP. TVA also finds that proposed pollinator vegetation plan would not affect historic properties and in fact may be beneficial to the site as it minimizes the erosion that is taking place within the agricultural fields. TVA is considering entering into a 20-year Power Purchase Agreement (PPA) with a qualified company to maintain and operate the facility under the PPA. If TVA chooses this option, TVA will reopen consultation with your office.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the APE that may be of religious and cultural significance and are eligible for the NRHP: Absentee Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Cherokee Nation, The Chickasaw Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Jena Band of Choctaw Indians, Kialegee Tribal Town, The Muscogee (Creek) Nation, Poarch Band of Creek Indians, The Seminole Nation of Oklahoma, Shawnee Tribe, Thlopthlocco Tribal Town, and United Keetoowah Band of Cherokee Indians in Oklahoma.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36CFR 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4 (a)(4)(b).

Please respond by November 4, 2020 if you have any comments on the proposed undertaking.

Sir/Madam  
Page 4  
October 5, 2020

If you have any questions, please contact me by phone, (865) 253-1265, or by email, [mmshuler@tva.gov](mailto:mmshuler@tva.gov).

Sincerely,



Marianne Shuler  
Senior Specialist, Archaeologist, and Tribal Liaison  
Cultural Compliance

MSH:ABM  
Enclosures  
cc (Enclosures):

[REDACTED]  
Assistant Director of Cultural Preservation  
Eastern Shawnee Tribe of Oklahoma

[REDACTED]  
Cultural Preservation Consultant  
Shawnee Tribe

[REDACTED]  
Tribal Historic Preservation Officer  
Historic & Cultural Preservation Department  
The Muscogee (Creek) Nation

[REDACTED]  
Tribal Historic Preservation Officer  
Eastern Band of Cherokee Indians



# A Phase I Architectural Survey Associated with the Planned North Alabama Utility Scale Solar Project in Lawrence County, Alabama



# A Phase I Archaeological Survey Associated with the Planned North Alabama Utility Scale Solar Project in Lawrence County, Alabama



Tennessee  
Valley  
Archaeological  
Research



400 West Summit Hill Drive, Knoxville, Tennessee 37902

May 14, 2021

Ms. Lee Anne Wofford  
Deputy State Historic Preservation Officer  
Alabama Historical Commission  
468 South Perry Street  
Montgomery, Alabama 36130-0900

Dear Ms. Wofford:

THE PROPOSED TENNESSEE VALLEY AUTHORITY'S (TVA) NORTH ALABAMA SOLAR PROJECT (FORMALLY, SOLAR ONE PROJECT), ADDENDUM REPORT, LAWRENCE COUNTY, ALABAMA (AHC # 2021-0007) (TVA TRACKING NUMBER – CID 78110)

TVA previously consulted with your office regarding the findings of the archaeological and architectural surveys associated with the North Alabama Utility Scale Solar project. Tennessee Valley Archaeological Research (TVAR) updated the original report based on your feedback. The updated phase 1 archaeological report and the updated architectural report can be downloaded.

You requested that a limited scale metal detector sweep/survey around the [REDACTED] at NSCR-C34, NSCR-031, and at archaeological site 1LA1025. [REDACTED]

[REDACTED] TVAR conducted a metal detection survey at site 1LA1025. The updated Phase I Archaeological report contains the results of this additional work. The metal detection survey encompassed 11,650 square meters and resulted [REDACTED]

[REDACTED] Based on this additional fieldwork, TVA maintains that the investigated portion of site 1LA1025 within the area of potential effects (APE) lacks integrity and the proposed undertaking would not have an adverse effect to the site.

Due to additional design layout requests, TVA revised the APE to include selected areas within Tract D (7.5 acres) and Tract K (20 acres) that were not investigated during the previous large-scale archaeological survey conducted in 2020. TVAR conducted additional field investigations between February 1 and 3, 2021 and no additional resources were identified. The results of this additional survey are also provided in the updated Phase I Archaeological report.

Building on the information resulting from TVAR's Phase I Cultural Resources survey, TVA designed the planned solar array disturbance footprint (approximately 1,459 acres) to minimize impact to both archaeological resources and historic properties. Your office agreed with TVA

that 079-493, 079-496, 079-468, and LA00002 through LA00013 are not eligible for the National Register of Historic Places (NRHP). In your response to the architectural and archaeological surveys, you requested that historic architectural properties 079-58 (Wheeler Plantation/Pond Springs Plantation), 079-502 (Bride's Hill), 079-503 (Coleman Terry's Store/ American Store), 079-504 (a rectangular plan, one-story, central passage cottage owned constructed by Coleman Terry), LA0001 (the segment of the former Tuscumbia, Courtland, and Decatur (TC&D) Railroad), and late nineteenth to mid-twentieth century historic archaeological sites be evaluated within the context of a cultural landscape. To address your comments, TVA contracted with TVAR to produce the addendum report titled, *Assessment of Cultural Resources Associated with the Planned North Alabama Utility Scale Solar in Lawrence County, Alabama*, which can be downloaded.

The addendum report provides TVAR's additional archival research and historic landscape reconstruction conducted using the methodology developed in consultation with your office. TVAR assessed the architectural and archaeological sites within the context of a rural historic landscape as defined in National Register Bulletin 30, *Guidelines for Evaluating and Documenting Rural Historic Landscapes*.

Since the exact layout of the planned solar facility was unknown at the time of the TVAR's architectural survey conducted in 2020, TVAR generated individual viewshed models for each of the 15 survey tracts to provide flexibility in project design and aid in the avoidance of significant historic properties. Building on the results of TVAR's architectural survey, TVA designed the planned solar array footprint to minimize impact to four historic properties either listed on or considered eligible for the NRHP. As part of this additional documentation, TVAR included updated visual effect assessments for four properties either listed on (079-58 and 079-502) or considered eligible for (079-503 and LA0001) the NRHP. In addition, TVA contracted with HDR to conduct photo simulations from the location of the four listed or eligible properties where the solar panels would be visible. These simulations are provided in the addendum report.

Based on this additional research, TVAR is recommending the establishment of a Wheeler Station Rural Historic District (WSRHD), inclusive of both historic archaeological and architectural resources, covering approximately 4,275 acres that encompasses and extends outside of the archaeological and architectural APEs. The proposed period of significance for the WSRHD is 1818-1955, which reflects the continuous agricultural use of the property for 137 years, and TVAR recommends the district eligible under Criteria A, B, C, and D. Properties 079-58 and 079-502 are associated with the initial development of the plantation era landscape in Lawrence County between 1820 and 1840. There are areas located within the original bounds of these properties, as well as the overall proposed WSRHD encompassing the planned project footprint, that appear to retain vestiges of the rural historic landscape that first developed between 1820 and 1840 and continued into the 1950s, including open agricultural fields and tree lines along property boundaries. Although most of the original build environment (buildings and structures) associated with the development of the proposed WSRHD has been effectively removed or significantly altered by post-1955 cultural processes, the agricultural fields have remained largely intact since the 1930s, and likely since the plantation era (1818-1865).

- TVAR recommends 079-504 ineligible for the NRHP. Your office disagrees with this recommendation. TVA maintains that the structure lacks integrity based on the construction of a 1960s addition to the back of the dwelling and the introduction of modern materials such as vinyl siding and metal windows. As 079-504 does not retain integrity, TVA finds that the property is neither individually eligible nor a contributing property to the WSRHD. In addition, based on the revised viewshed analysis 079-504 is no longer within the proposed solar array's viewshed; views to the solar panels would be blocked by vegetation and property 079-503.
- Your office agreed with TVA that LA00001 is eligible for the NRHP, but disagreed with TVA that the property has lost integrity of setting. Based on additional research, TVAR recommends LA00001 a contributing resource to the potential WSRHD district. TVA designed the solar facility to minimize viewshed effects to this historic property. Under the current design only the panels on the easternmost part of the project would be visible from the district. As stated above, there are some vestiges of the landscape within the entire APE that have remained unaltered during the period of significance of the property. However, large portions of this original landscape have been altered due to various above-ground intrusions outside the period of significance including land-use activities (primarily clear-cutting) and modern development (e.g., expansion of U.S. Highway 72, a transmission line corridor, and several modern buildings). This has diminished the property's integrity of setting and feeling. The photo-simulation of the proposed solar array (Figure 3.18 in the enclosed report) also demonstrates that the small portion of the project footprint that will be visible from LA00001 will be minimal and the view has been previously affected by the construction of U.S. Highway 72 and the Glen Allen Railroad, Inc. distribution center. TVA maintains that the proposed undertaking would not further diminish LA00001's integrity despite the potential effects to the larger WSRHD landscape.
- In regards to 079-58, based on the overall revised viewshed model, coupled with TVAR's in-field assessment and HDR's visual simulation, only one planned block of solar panels, located approximately 270 meters southeast of the property's NRHP boundary, would be visible from the property. As the visual simulation (presented in Figure 3.16 in the enclosed report) illustrates, the planned solar panel block would be marginally visible from the northeastern grounds of the property, and visibility of the planned solar panel block would diminish further as one moves to the northwest within the property grounds. The view toward the planned solar panels from within the northeastern grounds of the property has been comprised by infrastructure (major visual intrusion) associated with the Glen Allen Railroad, Inc. Distribution Center. Lastly, the resource-specific viewshed model for the Joe Wheeler House indicates that none of the planned solar panel blocks would be visible (all outside the viewshed) from the second floor of the structure. For the reasons outlined above, TVA maintains that the proposed undertaking would not further diminish 079-58's integrity despite the potential effects to the larger WSRHD landscape.

- In regards to Property 079-502, based on the overall revised viewshed model, coupled with TVAR's in-field assessment and visual simulation, two planned solar panel blocks located approximately 350 meters and 650 meters southwest of the cottage would be visible. The property's southern boundary (open agricultural field) falls within the viewshed of a third planned solar panel block located approximately 40 meters south of the property's boundary. As the visual simulation presented in Figure 3.14 in the enclosed report demonstrates, the planned solar panel block would be minimally visible from the cottage. The historic setting of the property has been compromised by various above-ground intrusions constructed after the property's period of significance (as well as the period of significance for the proposed), including multiple single-family dwellings and several above ground utilities in the area. TVA maintains that the proposed undertaking would not further diminish 079-502's integrity despite the potential effects to the larger WSRHD landscape.
- In regards to 079-503, the nearest planned solar panel block would be located approximately 415 meters southwest of the property. As the visual simulation, presented in Figure 3.14, demonstrates the planned solar panel block would be minimally visible from the store. As the case for property 079-502, the historic setting of property 079-503 has been diminished by various above-ground intrusions constructed after the property's period of significance, including a manufactured home, multiple single-family dwellings, and several above ground utilities. TVA maintains that the proposed undertaking would not further diminish 079-503's integrity despite the potential effects to the larger WSRHD landscape.
- Twenty-five archaeological sites are either exclusively (n=13) or predominately (n=12) associated with historic occupations, and one site contains two spatially distinct artifact concentrations associated with precontact and historic occupations (with some overlap). [REDACTED]  
[REDACTED] TVAR recommends eleven sites (1LA981, 1LA989, 1LA990, 1LA998, 1LA1002, 1LA1003, 1LA1016, 1LA1022, 1LA1035, 1LA1036, and 1LA1037) are eligible for the NRHP under Criteria A and D as contributing resources to the proposed WSRHD. All eleven sites are located outside the planned solar array footprint as currently proposed.

### Effect finding

Per our discussion, TVA designed the proposed undertaking to avoid physical alterations and avoid or minimize viewshed effects to the four properties either listed on (079-58 and 079-502) or considered eligible for (079-503 and LA0001) the NRHP. Furthermore, all archaeological sites considered undetermined or eligible for the NRHP, including those recommended contributing to the eligibility of the WSRHD, will be avoided.

Based on TVAR's analysis, 82 percent (1,459 acres) of the disturbance footprint of the planned solar facility will be located within acreage associated with the rural historic landscape that is a

character-defining feature of the proposed WSRHD. The disturbance footprint would physically alter the cultural landscape of the proposed WSRHD and would introduce new elements to the historically rural landscape including solar panel blocks, a substation, a battery energy storage system, gravel access roads, and chain-link fencing. In addition, TVAR's analysis indicates that infrastructure associated with the disturbance footprint would alter the visual integrity of the proposed WSRHD, as well viewsheds and views within the district (approximately 1,563 acres), via the addition of physical elements to the landscape that are not in keeping with the character of the rural historic landscape, mainly as such relates to the arrangement of agricultural fields.

As stated in the addendum report, as part of TVA's Environmental Impact Statement (which can be downloaded here, [North Alabama Utility-Scale Solar Project \(tva.com\)](https://www.tva.com/north-alabama-utility-scale-solar-project)) an auditory and traffic assessment was conducted. The only auditory changes expected would be temporary and associated with the construction of the facility. The majority of the construction activities would not mark a significant difference in the noise levels. The activity most likely to have a change in noise levels (approximately 90 to 95 decibels) would be pile driving during construction of the solar arrays. While noise related to pile driving may be perceptible in portions of the proposed WSRHD, the noise would not be at sustained levels and temporary and would not alter characteristics that qualify the district, or its contributing elements, for the NRHP. While there may be a slight increase in traffic during the construction (approximately 24 -36 months), overall, this slight increase would be temporary and would not result in any long-term atmospheric effects on the integrity of the proposed WSRHD. The construction traffic would generally not interfere with visitor or periodic event traffic associated with property 079-58. The property is directly accessed from U.S. Highway 72, and access to the proposed Undertaking would be available from multiple directions and a variety of roads. TVA plans to conduct a pre-construction traffic study to ensure that the activities related to the construction of the undertaking would not disrupt normal traffic patterns in the area. If disruption should occur due to the undertaking's related activities, TVA would implement mitigation measures to address these traffic flow issues.

Potential post-construction atmospheric effects related to the operation and maintenance of the solar facility would include the introduction of operational lighting. Both the substation and battery energy storage system would have permanent lighting to facilitate night access. The lights would be fully shielded or would have internal low-glare optics, such that no light is emitted from the fixtures at angles above the horizontal plane, to minimize impacts to surrounding areas. In addition, to minimize or eliminate effects from glare and reflection associated with the operation of the solar arrays, TVA plans to install anti-reflective PV panels.

Although TVA modified the undertaking in order to avoid or minimize effects to individual contributing historic properties, the proposed undertaking would alter the historic characteristics that qualify the proposed rural landscape district for the NRHP by diminishing its integrity of design, setting, materials, workmanship, feeling, and association. Thus the undertaking, as currently planned, would cause an adverse effect on the proposed WSRHD.

Pursuant to 36 CFR Part 800.6(c), TVA proposes to enter into a Memorandum of Agreement (MOA) with your office to mitigate the adverse effects of this Undertaking. In order to mitigate



Ms. Lee Anne Wofford  
Page 6  
May 14, 2021

the effects, TVA is proposing developing public outreach material, in the form of signage or another type of public interpretative material that would reinforce or enhance existing heritage educational programs or heritage tourism initiatives. Please provide us with any ideas or suggestions you may have regarding a mitigation plan.

TVA is seeking your agreement with,

- TVA's eligibility determinations;
- TVA's finding that the undertaking as currently planned would not result in effects to the archaeological sites either considered undetermined or determined eligible for the NRHPA;
- TVA's finding that the undertaking would not adversely effect historic structures 079-58, 079-502, 079-503, and LA0001;
- TVA's recommendation regarding the WSRHD and contributing and noncontributing resources;
- The undertaking as currently planned would have an adverse effect on WSRHD; and
- TVA's proposal to enter into an MOA for the resolution of the undertaking's adverse effects.

Please contact Michaelyn Harle by email, [mharle@tva.gov](mailto:mharle@tva.gov), with your comments.

Sincerely,



Clinton E. Jones  
Manager  
Cultural Compliance

MSH:ABM  
Enclosures



400 West Summit Hill Drive, Knoxville, Tennessee 37902

May 14, 2021

Mr. Paul Barton  
Tribal Historic Preservation Officer  
Eastern Shawnee Tribe of Oklahoma

[REDACTED]

Ms. Karen Brunso  
Tribal Historic Preservation Officer  
Division of Historic Preservation  
Department of Culture & Humanities  
The Chickasaw Nation

[REDACTED]

Ms. RaeLynn Butler  
Manager  
Historic & Cultural Preservation Department  
The Muscogee (Creek) Nation

[REDACTED]

Mr. Bryant Celestine  
Tribal Historic Preservation Officer  
Alabama-Coushatta Tribe of Texas

[REDACTED]

Mr. Galen Cloud  
Tribal Historic Preservation Officer  
Thlopthlocco Tribal Town

[REDACTED]

Mr. David Cook  
Tribal Administrator  
Kialegee Tribal Town

[REDACTED]

Ms. Devon Frazier  
Tribal Historic Preservation Officer  
Absentee Shawnee Tribe of Indians of  
Oklahoma

[REDACTED]

Mr. Larry Haikey  
Tribal Historic Preservation Officer  
Poarch Band of Creek Indians  
Regulatory Affairs Division

[REDACTED]

Dr. Linda Langley  
Tribal Historic Preservation Officer  
Coushatta Tribe of Louisiana

[REDACTED]

Ms. Janice Lowe  
Cultural Preservation Assistant  
Alabama-Quassarte Tribal Town

[REDACTED]

Mr. Edwin Marshall  
Tribal Historic Preservation Officer  
The Seminole Nation of Oklahoma

[REDACTED]

Ms. Alina J. Shively  
Tribal Historic Preservation Officer  
Jena Band of Choctaw Indians

[REDACTED]

Ms. Tonya Tipton  
Tribal Historic Preservation Officer  
Shawnee Tribe  
[REDACTED]

Ms. Whitney Warrior  
Director of Historic Preservation  
United Keetoowah Band of Cherokee  
Indians in Oklahoma  
[REDACTED]

Ms. Elizabeth Toombs  
Tribal Historic Preservation Officer  
Cherokee Nation  
[REDACTED]

Mr. Stephen Yerka  
Historic Preservation Specialist  
Tribal Historic Preservation Office  
Eastern Band of Cherokee Indians  
[REDACTED]

Dear Sir/ Madam:

THE PROPOSED TENNESSEE VALLEY AUTHORITY'S (TVA) NORTH ALABAMA SOLAR PROJECT (FORMALLY, SOLAR ONE PROJECT), ADDENDUM REPORT, LAWRENCE COUNTY, ALABAMA (TVA TRACKING NUMBER – CID 78110)

In a letter dated October 5, 2020, TVA consulted with your office regarding the results of the Phase I survey and our findings of effect regarding the proposed findings of the archaeological and architectural surveys associated with the North Alabama Utility Scale Solar project. TVA received no concerns from federally recognized Tribes. TVA did receive comments from the Alabama State Historic Preservation Office (AL SHPO) disagreeing with some of TVA's findings. Their comments and our responses are discussed below. By this letter, TVA is providing you the updated reports and additional documentation including the results from an additional phase 1 archaeological survey of two additional tracts. The updated phase 1 archaeological report can be downloaded at:

[http://www.tvaresearch.com/download/TVA\\_NAUSS\\_Project\\_Revised\\_Archaeological\\_Rpt.pdf](http://www.tvaresearch.com/download/TVA_NAUSS_Project_Revised_Archaeological_Rpt.pdf)

and the updated architectural report can be downloaded at:

[http://www.tvaresearch.com/download/TVA\\_NAUSS\\_Project\\_Revised\\_Architectural\\_Rpt.pdf](http://www.tvaresearch.com/download/TVA_NAUSS_Project_Revised_Architectural_Rpt.pdf)

[REDACTED]

recovered from the site. Based on this additional fieldwork, TVA maintains that the investigated portion of site 1LA1025 within the area of potential effects (APE) lacks integrity and the proposed undertaking would not have an adverse effect to the site.

Due to additional design layout requests, TVA revised the APE to include selected areas within Tract D (7.5 acres) and Tract K (20 acres) that were not investigated during the previous large-scale archaeological survey conducted in 2020. TVAR conducted additional field investigations between February 1 and 3, 2021 and no additional resources were identified. The results of this additional survey is also provided in the revised report.

Building on the information resulting from TVAR's Phase I Cultural Resources survey, TVA designed the planned solar array disturbance footprint (approximately 1,459 acres) to minimize impact to both archaeological resources and historic properties. The AL SHPO agreed with TVA that 079-493, 079-496, 079-468, and LA00002 through LA00013 are not eligible for the National Register of Historic Places (NRHP). In their response to the architectural and archaeological surveys, they requested that historic architectural properties 079-58 (Wheeler Plantation/Pond Springs Plantation), 079-502 (Bride's Hill), 079-503 (Coleman Terry's Store/American Store), 079-504 (a rectangular plan, one-story, central passage cottage owned constructed by Coleman Terry), LA0001 (the segment of the former Tuscumbia, Courtland, and Decatur (TC&D) Railroad), and late nineteenth to mid-twentieth century historic archaeological sites be evaluated within the context of a cultural landscape. To address AL SHPO's comments, TVA contracted with TVAR to produce the addendum report titled, *Assessment of Cultural Resources Associated with the Planned North Alabama Utility Scale Solar in Lawrence County, Alabama*, which can be downloaded at:  
[http://www.tvaresearch.com/download/TVA\\_NAUSS\\_Project\\_Assessment\\_Rpt.pdf](http://www.tvaresearch.com/download/TVA_NAUSS_Project_Assessment_Rpt.pdf).

The addendum report provides TVAR's additional archival research and historic landscape. TVAR assessed the architectural and archaeological sites within the context of a rural historic landscape as defined in National Register Bulletin 30, *Guidelines for Evaluating and Documenting Rural Historic Landscapes*.

Since the exact layout of the planned solar facility was unknown at the time of the TVAR's architectural survey conducted in 2020, TVAR generated individual viewshed models for each of the 15 survey tracts to provide flexibility in project design and aid in the avoidance of significant historic properties. Building on the results of TVAR's architectural survey, TVA designed the planned solar array footprint to minimize impact to four historic properties either listed on or considered eligible for the NRHP. As part of this additional documentation, TVAR included updated visual effect assessments for four properties either listed on (079-58 and 079-502) or considered eligible for (079-503 and LA0001) the NRHP. In addition, TVA contracted with HDR to conduct photo simulations from the location of the four listed or eligible properties where the solar panels would be visible. These simulations are provided in the addendum report.

Based on this additional research, TVAR is recommending the establishment of a Wheeler Station Rural Historic District (WSRHD), inclusive of both historic archaeological and architectural resources, covering approximately 4,275 acres that encompasses and extends outside of the archaeological and architectural APEs. The proposed period of significance for the WSRHD is 1818-1955, which reflects the continuous agricultural use of the property for 137 years, and TVAR recommends the district eligible under Criteria A, B, C, and D. Properties 079-58 and 079-502 are associated with the initial development of the plantation era landscape in Lawrence County between 1820 and 1840. There are areas located within the original bounds of these properties, as well as the overall proposed WSRHD encompassing the planned project footprint, that appear to retain vestiges of the rural historic landscape that first developed between 1820 and 1840 and continued into the 1950s, including open agricultural fields and



tree lines along property boundaries. Although most of the original build environment (buildings and structures) associated with the development of the proposed WSRHD has been effectively removed or significantly altered by post-1955 cultural processes, the agricultural fields have remained largely intact since the 1930s, and likely since the plantation era (1818-1865).

- TVAR recommends 079-504 ineligible for the NRHP. The AL SHPO disagreed with this recommendation. TVA maintains that the structure lacks integrity based on the construction of a 1960s addition to the back of the dwelling and the introduction of modern materials such as vinyl siding and metal windows. As 079-504 does not retain integrity, TVA finds that the property is neither individually eligible nor a contributing property to the WSRHD. In addition, based on the revised viewshed analysis 079-504 is no longer within the proposed solar array's viewshed; views to the solar panels would be blocked by vegetation and property 079-503.
- The AL SHPO disagreed with TVA that LA00001 is eligible for the NRHP, but disagreed with TVA that the property has lost integrity of setting. Based on additional research, TVAR recommends LA00001 a contributing resource to the potential WSRHD district. TVA designed the solar facility to minimize viewshed effects to this historic property. Under the current design only the panels on the easternmost part of the project would be visible from the district. As stated above, there are some vestiges of the landscape within the entire APE that have remained unaltered during the period of significance of the property. However, large portions of this original landscape have been altered due to various above-ground intrusions outside the period of significance including land-use activities (primarily clear-cutting) and modern development (e.g., expansion of U.S. Highway 72, a transmission line corridor, and several modern buildings). This has diminished the property's integrity of setting and feeling. The photo-simulation of the proposed solar array (Figure 3.18 in the enclosed report) also demonstrates that the small portion of the project footprint that will be visible from LA00001 will be minimal and the view has been previously affected by the construction of U.S. Highway 72 and the Glen Allen Railroad, Inc. distribution center. TVA maintains that the proposed undertaking would not further diminish LA00001's integrity despite the potential effects to the larger WSRHD landscape.
- In regards to 079-58, based on the overall revised viewshed model, coupled with TVAR's in-field assessment and HDR's visual simulation, only one planned block of solar panels, located approximately 270 meters southeast of the property's NRHP boundary, would be visible from the property. As the visual simulation (presented in Figure 3.16 in the enclosed report) illustrates, the planned solar panel block would be marginally visible from the northeastern grounds of the property, and visibility of the planned solar panel block would diminish further as one moves to the northwest within the property grounds. The view toward the planned solar panels from within the northeastern grounds of the property has been comprised by infrastructure (major visual intrusion) associated with the Glen Allen Railroad, Inc. Distribution Center. Lastly, the resource-specific viewshed model for the Joe Wheeler House indicates that none of the

planned solar panel blocks would be visible (all outside the viewshed) from the second floor of the structure. For the reasons outlined above, TVA maintains that the proposed undertaking would not further diminish 079-58's integrity despite the potential effects to the larger WSRHD landscape.

- In regards to Property 079-502, based on the overall revised viewshed model, coupled with TVAR's in-field assessment and visual simulation, two planned solar panel blocks located approximately 350 meters and 650 meters southwest of the cottage would be visible. The property's southern boundary (open agricultural field) falls within the viewshed of a third planned solar panel block located approximately 40 meters south of the property's boundary. As the visual simulation presented in Figure 3.14 in the enclosed report demonstrates, the planned solar panel block would be minimally visible from the cottage. The historic setting of the property has been compromised by various above-ground intrusions constructed after the property's period of significance (as well as the period of significance for the proposed), including multiple single-family dwellings and several above ground utilities in the area. TVA maintains that the proposed undertaking would not further diminish 079-502's integrity despite the potential effects to the larger WSRHD landscape.
- In regards to 079-503, the nearest planned solar panel block would be located approximately 415 meters southwest of the property. As the visual simulation, presented in Figure 3.14, demonstrates the planned solar panel block would be minimally visible from the store. As the case for property 079-502, the historic setting of property 079-503 has been diminished by various above-ground intrusions constructed after the property's period of significance, including a manufactured home, multiple single-family dwellings, and several above ground utilities. TVA maintains that the proposed undertaking would not further diminish 079-503's integrity despite the potential effects to the larger WSRHD landscape.
- Twenty-five archaeological sites are either exclusively (n=13) or predominately (n=12) associated with historic occupations, and one site contains two spatially distinct artifact concentrations associated with precontact and historic occupations (with some [REDACTED] recommends eleven sites (1LA981, 1LA989, 1LA990, 1LA998, 1LA1002, 1LA1003, 1LA1016, 1LA1022, 1LA1035, 1LA1036, and 1LA1037) are eligible for the NRHP under Criteria A and D as contributing resources to the proposed WSRHD. All eleven sites are located outside the planned solar array footprint as currently proposed.

### Effect finding

Per our discussion, TVA designed the proposed undertaking to avoid physical alterations and avoid or minimize viewshed effects to the four properties either listed on (079-58 and 079-502)

or considered eligible for (079-503 and LA0001) the NRHP. Furthermore, all archaeological sites considered undetermined or eligible for the NRHP, including those recommended contributing to the eligibility of the WSRHD, will be avoided.

Based on TVAR's analysis, 82 percent (1,459 acres) of the disturbance footprint of the planned solar facility will be located within acreage associated with the rural historic landscape that is a character-defining feature of the proposed WSRHD. The disturbance footprint would physically alter the cultural landscape of the proposed WSRHD and would introduce new elements to the historically rural landscape including solar panel blocks, a substation, a battery energy storage system, gravel access roads, and chain-link fencing. In addition, TVAR's analysis indicates that infrastructure associated with the disturbance footprint would alter the visual integrity of the proposed WSRHD, as well viewsheds and views within the district (approximately 1,563 acres), via the addition of physical elements to the landscape that are not in keeping with the character of the rural historic landscape, mainly as such relates to the arrangement of agricultural fields.

As stated in the addendum report, as part of TVA's Environmental Impact Statement (which can be downloaded here, [North Alabama Utility-Scale Solar Project \(tva.com\)](https://www.tva.com/north-alabama-utility-scale-solar-project)) an auditory and traffic assessment was conducted. The only auditory changes expected would be temporary and associated with the construction of the facility. The majority of the construction activities would not mark a significant difference in the noise levels. The activity most likely to have a change in noise levels (approximately 90 to 95 decibels) would be pile driving during construction of the solar arrays. While noise related to pile driving may be perceptible in portions of the proposed WSRHD, the noise would not be at sustained levels and temporary and would not alter characteristics that qualify the district, or its contributing elements, for the NRHP. While there may be a slight increase in traffic during the construction (approximately 24 -36 months), overall, this slight increase would be temporary and would not result in any long-term atmospheric effects on the integrity of the proposed WSRHD. The construction traffic would generally not interfere with visitor or periodic event traffic associated with property 079-58. The property is directly accessed from U.S. Highway 72, and access to the proposed Undertaking would be available from multiple directions and a variety of roads. TVA plans to conduct a pre-construction traffic study to ensure that the activities related to the construction of the undertaking would not disrupt normal traffic patterns in the area. If disruption should occur due to the undertaking's related activities, TVA would implement mitigation measures to address these traffic flow issues.

Potential post-construction atmospheric effects related to the operation and maintenance of the solar facility would include the introduction of operational lighting. Both the substation and battery energy storage system would have permanent lighting to facilitate night access. The lights would be fully shielded or would have internal low-glare optics, such that no light is emitted from the fixtures at angles above the horizontal plane, to minimize impacts to surrounding areas. In addition, to minimize or eliminate effects from glare and reflection associated with the operation of the solar arrays, TVA plans to install anti-reflective PV panels.

Although TVA modified the undertaking in order to avoid or minimize effects to individual contributing historic properties, the proposed undertaking would alter the historic characteristics



Sir/Madam  
Page 6  
May 14, 2021

that qualify the proposed rural landscape district for the NRHP by diminishing its integrity of design, setting, materials, workmanship, feeling, and association. Thus the undertaking, as currently planned, would cause an adverse effect on the proposed WSRHD.

Pursuant to 36 CFR Part 800.6(c), TVA proposes to enter into a Memorandum of Agreement (MOA) to mitigate the adverse effects of this Undertaking. In order to mitigate the effects, TVA is proposing developing public outreach material, in the form of signage or another type of public interpretative material that would reinforce or enhance existing heritage educational programs or heritage tourism initiatives.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the APE that may be of religious and cultural significance and are eligible for the NRHP: Absentee Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Cherokee Nation, The Chickasaw Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Jena Band of Choctaw Indians, Kialegee Tribal Town, The Muscogee (Creek) Nation, Poarch Band of Creek Indians, The Seminole Nation of Oklahoma, Shawnee Tribe, Thlopthlocco Tribal Town, and United Keetoowah Band of Cherokee Indians in Oklahoma.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36CFR 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4 (a)(4)(b).

Please respond by June 13, 2021 if you have any comments on the proposed undertaking. If you have any questions, please contact me by phone, (865) 632-2464, or by email, [mmshuler@tva.gov](mailto:mmshuler@tva.gov).

Sincerely,



Marianne Shuler  
Senior Specialist, Archaeologist, and Tribal Liaison  
Cultural Compliance

Sir/Madam  
Page 7  
May 14, 2021

MSH:ABM

Enclosures

cc (Enclosures):

Ms. Sheila Bird  
Cultural Preservation Consultant  
Shawnee Tribe  
[REDACTED]

Ms. Erica Gorsuch  
Assistant THPO/Section 106 Coordinator  
United Keetoowah Band of Cherokee Indians in Oklahoma  
[REDACTED]

Ms. Corain Lowe-Zepeda  
Tribal Historic Preservation Officer  
Historic & Cultural Preservation Department  
The Muscogee (Creek) Nation  
[REDACTED]

Mr. Russell Townsend  
Tribal Historic Preservation Officer  
Eastern Band of Cherokee Indians  
[REDACTED]

June 3, 2021

Ms. Marianne Shuler, Senior Specialist,  
Archaeologist and Tribal Liaison  
Cultural Compliance  
Tennessee Valley Authority  
400 West Summit Hill Drive  
460 WT 7D-K  
Knoxville, TN 37902

Dear Ms. Shuler:

Thank you for sending the letter and the amended Phase I cultural resource survey regarding the construction of a solar project in Lawrence County, Alabama (CID 78110). We wish to consult under Section 106 of the National Historic Preservation Act.

The Chickasaw Nation supports the proposed undertaking and is not presently aware of any specific historic properties, including those of traditional religious and cultural significance, in the project area. In addition we do not want to participate in the development of an MOA for the adverse effect to historic properties effected. In the event the agency becomes aware of the need to enforce other statutes we request to be notified under ARPA, AIRFA, NEPA, NAGPRA, NHPA and Professional Standards.

Your efforts to preserve and protect significant historic properties are appreciated. If you have any questions, please contact Ms. Karen Brunso, tribal historic preservation officer, at (580) 272-1106, or by email at [karen.brunso@chickasaw.net](mailto:karen.brunso@chickasaw.net).

Sincerely,

Lisa John, Secretary  
Department of Culture and Humanities

cc: [mmshuler@tva.gov](mailto:mmshuler@tva.gov)

**Harle, Michaelyn S**

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**From:** Section106 [REDACTED]  
**Sent:** Friday, June 18, 2021 10:04 AM  
**To:** Shuler, Marianne M <[mmshuler@tva.gov](mailto:mmshuler@tva.gov)>  
**Subject:** Re: TVA-North Alabama Solar-UPDATE-LawrenceCoAL-CID78110-14May2021

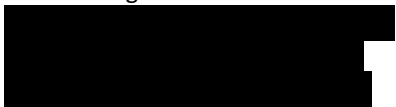
**This is an EXTERNAL EMAIL from outside TVA. THINK BEFORE you CLICK links or OPEN attachments. If suspicious, please click the “Report Phishing” button located on the Outlook Toolbar at the top of your screen.**

Good morning Ms. Shuler,

Thank you for sending the correspondence regarding the proposed North Alabama Utility Solar project update including the proposed MOA. The Muscogee Nation agrees with the recommendations of avoiding all undetermined or eligible sites. Although the proposed WSRHD is comprised mostly of historic resources, the Muscogee Nation concurs that it is significant for listing in the NRHP and that the undertaking would cause an adverse effect to the proposed WSRHD. Since this is a proposed historic district, I am not sure if the Muscogee Nation would participate in the MOA; however, could you please provide a copy of it? I will talk with RaeLynn and see what she thinks.

Thank you,

**Robin Soweka, Jr.**  
Cultural Resource Specialist, Historic and Cultural Preservation Department  
The Muscogee Nation

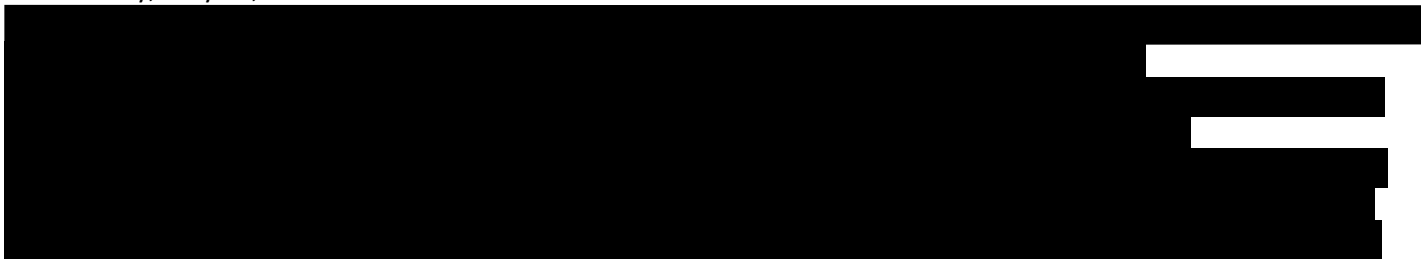


MuscogeeNation.com



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**From:** Shuler, Marianne M <[mmshuler@tva.gov](mailto:mmshuler@tva.gov)>  
**Sent:** Friday, May 14, 2021 2:40 PM



[REDACTED]

**Subject:** TVA-North Alabama Solar-UPDATE-LawrenceCoAL-CID78110-14May2021

Good Afternoon

By this email I am sending the attached letter regarding TVA's proposed North Alabama Utility solar project located in Lawrence County, Alabama. TVA previously consulted with your office in October of 2020. The AL SHPO had comments and TVA is providing you these comments and our responses in the enclosed letter.

The following reports can be downloaded at the links below.

The updated phase 1 archaeological report can be downloaded at:

[REDACTED]

and the updated architectural report can be downloaded at:

[REDACTED]

*Assessment of Cultural Resources Associated with the Planned North Alabama Utility Scale Solar in Lawrence County, Alabama,*  
which can be downloaded at: [REDACTED]

Please let me know by June 13 if you have any questions or comments on the proposed undertaking.

Thanks

Marianne

**Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.**

**Marianne Shuler**

Senior Specialist, Archaeologist & Tribal Liaison

Cultural Compliance

Tennessee Valley Authority

400 W. Summit Hill Drive

Knoxville, TN 37902

(865)253-1265 (w)

[mmshuler@tva.gov](mailto:mmshuler@tva.gov)



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# ALABAMA HISTORICAL COMMISSION

468 South Perry Street  
Montgomery, Alabama 36130-0900

Lisa D. Jones  
Executive Director  
State Historic Preservation Officer

Tel: 334-242-3184  
Fax: 334-242-1083

June 29, 2021

Clinton E. Jones  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, TN 37902

Re: AHC 2021-0007 (also 2020-1259)  
TVA North Alabama Utility Scale Solar Project  
Revised Archaeological and Architectural Assessment Reports  
Lawrence County

Dear Mr. Jones:

Upon review of the revised cultural resources assessment reports (archaeology and architecture), we find that we agree with the findings of both reports. Per your letter of 14 May 2021:

- We concur with TVA's eligibility determinations as presented in the two assessment reports;
- We concur with TVA's finding that the undertaking as currently planned would not result in effects to the archaeological sites either considered undetermined or determined eligible for the National Register of Historic Places (NRHP);
- We concur with TVA's finding that the undertaking would not adversely affect historic structures 079-58, 079-502, 079-503, and LA0001;
- We agree with TVA's recommendation that the Wheeler Station Rural Historic District (WSRHD) is eligible for the NRHP, and we further agree with the proposed contributing and noncontributing resources;
- We agree that the undertaking as currently planned would have an adverse effect on the WSRHD.

Given the federal determination of adverse effect to the NRHP eligible WSRHD, we agree with TVA's proposal to enter into a Memorandum of Agreement (MOA) for the resolution of the undertaking's adverse effects. We look forward to the draft MOA, as well as the proposed mitigation measures.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact me at 334.230.2659 or [LeeAnne.Wofford@ahc.alabama.gov](mailto:LeeAnne.Wofford@ahc.alabama.gov). Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford  
Deputy State Historic Preservation Officer

LAW/SGH/EDS/WJL/eds



400 West Summit Hill Drive, Knoxville, Tennessee 37902

February 9, 2022

Ms. Lee Anne Wofford  
Deputy State Historic Preservation Officer  
Alabama Historical Commission  
468 South Perry Street  
Montgomery, Alabama 36130-0900

Dear Ms. Wofford:

TENNESSEE VALLEY AUTHORITY'S (TVA) MOUNTAIN HOME 161-KILOVOLT (KV)  
OVERHEAD GROUND WIRE REPLACEMENT PROJECT, LAWRENCE COUNTY, ALABAMA  
(34.6006951 -87.1896009) (TVA TRACKING NUMBER - CID 82180)

TVA proposes to install overhead ground wire on a portion of the existing Reservation-Mountain Home transmission line (TL) (L5148) to support the communication needs for TVA's North Alabama Solar Project. As part of the undertaking, splice cases will be installed on existing structures 249, 272, 291, and 308; cross bracing and cross arms will be added to existing structures along the fiber route; and structures 249, 251, 283, and 302 will be replaced with new poles to support the fiber. Additionally, access routes to the work areas may require some modification, such as the addition of gravel or minor grading.

TVA determined the area of potential effects to be the approximately 7.5 mile by 100 foot wide TL right of way (ROW) where work would be performed and the 2.9 mile long access routes (ARs) outside the TL ROW. If these ARs are either a paved or gravel road or driveway, the APE would narrow to the width of the existing road. The structures that require upgrades or replacements range from an install date of the 1980's through the early 2000's. The proposed undertaking does not have the potential for visual effects on aboveground resources, as the proposed poles will not be appreciably higher than the existing poles (consistent with item E-7 in Appendix A of TVA's Section 106 PA).

TVA contracted with Tennessee Valley Archaeological Research (TVAR) to conduct a Phase I Archeological resources survey of the APE. The resulting report titled *A Phase I Archeological Survey for the Tennessee Valley Authority's Reservation-Mountain Home 161 kV Transmission Line Project in Lawrence County, Alabama* can be downloaded.

During the current survey, TVAR revisited one previously recorded archaeological site 1LA951 and identified two archaeological sites (1LA1051 and 1LA1052) and seven isolated finds. Site 1LA951, previously recommended ineligible, was not relocated within the current APE. TVAR recommends that sites 1LA1051, [REDACTED] and 1LA1052, [REDACTED], within the survey area lack integrity and research potential. As the



Ms. Lee Anne Wofford  
Page 2  
February 9, 2022

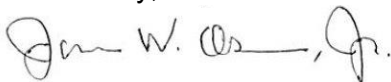
sites likely extend outside the survey area and were not fully delineated due to the constraints of the TL ROW, TVAR recommends that the National Register of Historic Places (NRHP) eligibility of sites 1LA1051 and 1LA1052 should be considered unassessed. However, TVAR recommends that TVA's project plans would not pose an adverse effect to the identified portions of 1LA1051 or 1LA1052 within the area of proposed disturbance. TVA has reviewed the enclosed report and agrees with the authors' findings and recommendations. TVA finds that the proposed undertaking would have no adverse effects to historic properties.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding properties within the proposed project's APE that may be of religious and cultural significance to them and eligible for the NRHP.

Pursuant to 36 CFR Part 800.5(c) we are notifying you of TVA's finding of no adverse effect to historic properties, providing the documentation specified in § 800.11(d); and inviting you to review the finding. Also, we are seeking your agreement with TVA's eligibility determinations and finding that the undertaking as currently planned will have no adverse effects on historic properties.

Please contact Michaelyn Harle by email, [mharle@tva.gov](mailto:mharle@tva.gov), with your comments.

Sincerely,

A handwritten signature in dark ink, appearing to read "James W. Osborne, Jr.", with a stylized flourish at the end.

James W. Osborne Jr.  
Manager  
Cultural Compliance

MSH:ABM  
Enclosures



# ALABAMA HISTORICAL COMMISSION

468 South Perry Street  
Montgomery, Alabama 36130-0900

Lisa D. Jones  
Executive Director  
State Historic Preservation Officer

Tel: 334-242-3184  
Fax: 334-242-1083

March 3, 2022

James Osborne Jr.  
TVA  
400 West Summit Hill Drive  
Knoxville, TN 37902

Re: AHC 22-0368  
Mountain Home 161-Kilovolt (KV) Overhead Ground Wire Replacement Project  
Lawrence County

Dear Mr. Osborne:

Upon review of the cultural resources assessment provided for the above referenced undertaking, we find that we agree with TVA's determination of effect for this project. Although archaeological sites 1La1051 and 1La1052 remain unevaluated for the National Register of Historic Places (NRHP), the portions within the Area of Potential Effect (APE) do not contribute to the sites' NRHP eligibility. The remaining sites and isolated finds in the APE are not eligible for the NRHP. Thus, we agree with your finding of no adverse effect to historic properties for this undertaking.

Consultation with the State Historic Preservation Office does not constitute consultation with Tribal Historic Preservation Offices, other Native American tribes, local governments, or the public. If archaeological materials are encountered during construction, the procedures codified at 36 CFR 800.13(b) will apply. Archaeological materials consist of any items, fifty years old or older, which were made or used by man. These items include but are not limited to, stone projectile points (arrowheads), ceramic sherds, bricks, worked wood, bone and stone, metal, and glass objects. The federal agency or the applicant receiving federal assistance should contact our office immediately. If human remains are encountered, the provisions of the Alabama Burial Act (Code of Alabama 1975, §13A-7-23.1, as amended; Alabama Historical Commission Administrative Code Chapter 460-X-10 Burials) should be followed. This stipulation shall be placed on the construction plans to ensure contractors are aware of it.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Eric Sipes at 334.230.2667 or [Eric.Sipes@ahc.alabama.gov](mailto:Eric.Sipes@ahc.alabama.gov). Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,

Lee Anne Wofford  
Deputy State Historic Preservation Officer

LAW/EDS/nj



August 6, 2021

Tennessee Valley Authority  
Generation Projects & Fleet Services  
1101 Market Street LP5B-C  
Chattanooga, Tennessee 37402-2801

Attention: Mr. Robert Kulisek, PE, PMP


Reference: **Report of Preliminary Geotechnical Exploration**  
**TVA Lagrande Property Site**  
Lawrence County, Alabama  
S&ME Project No. 212482

Dear Mr. Kulisek:

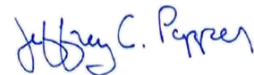
S&ME, Inc. (S&ME) is pleased to submit the following completed Report of Preliminary Geotechnical Exploration conducted at the project site in Lawrence County, Alabama. This report has been prepared in accordance with S&ME Revised Proposal No.212482, dated March 29, 2021 and as authorized by TVA Purchase Order No. 6793526. The following report presents our findings and recommendations for the proposed construction. Should you have any questions regarding this report, or if we can be of any further assistance, please contact us at your convenience.

Sincerely,

**S&ME, Inc.**



Jonathan M. Smolen, PE (TN)  
Senior Geotechnical Engineer



Jeffrey Pepper, PE  
Principal Engineer  
Alabama License No. 30081



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## **Appendix B – Scoping Documentation and Public Comments**

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of a transaction originated from the Exchange floor. Further, increasing the cap from \$700 to \$1,100 for the reversal and conversion, jelly roll and box spread strategies does not impose an undue burden on competition because all members may qualify for the new qualification by aggregating all options classes to qualify for the increased cap in the merger and short stock interest, reversal and conversion, jelly roll and box spread strategies

*C. Self-Regulatory Organization's Statement on Comments on the Proposed Rule Change Received From Members, Participants, or Others*

No written comments were either solicited or received.

**III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action**

The foregoing rule change has become effective pursuant to Section 19(b)(3)(A)(ii) of the Act.<sup>25</sup>

At any time within 60 days of the filing of the proposed rule change, the Commission summarily may temporarily suspend such rule change if it appears to the Commission that such action is: (i) Necessary or appropriate in the public interest; (ii) for the protection of investors; or (iii) otherwise in furtherance of the purposes of the Act. If the Commission takes such action, the Commission shall institute proceedings to determine whether the proposed rule should be approved or disapproved.

**IV. Solicitation of Comments**

Interested persons are invited to submit written data, views, and arguments concerning the foregoing, including whether the proposed rule change is consistent with the Act. Comments may be submitted by any of the following methods:

*Electronic Comments*

- Use the Commission's internet comment form (<http://www.sec.gov/rules/sro.shtml>); or
- Send an email to [rule-comments@sec.gov](mailto:rule-comments@sec.gov). Please include File Number SR-Phlx-2020-02 on the subject line.

*Paper Comments*

- Send paper comments in triplicate to Secretary, Securities and Exchange Commission, 100 F Street NE, Washington, DC 20549-1090.
- All submissions should refer to File Number SR-Phlx-2020-02. This file number should be included on the subject line if email is used. To help the Commission process and review your

comments more efficiently, please use only one method. The Commission will post all comments on the Commission's internet website (<http://www.sec.gov/rules/sro.shtml>). Copies of the submission, all subsequent amendments, all written statements with respect to the proposed rule change that are filed with the Commission, and all written communications relating to the proposed rule change between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5 U.S.C. 552, will be available for website viewing and printing in the Commission's Public Reference Room, 100 F Street NE, Washington, DC 20549, on official business days between the hours of 10:00 a.m. and 3:00 p.m. Copies of the filing also will be available for inspection and copying at the principal office of the Exchange. All comments received will be posted without change. Persons submitting comments are cautioned that we do not redact or edit personal identifying information from comment submissions. You should submit only information that you wish to make available publicly. All submissions should refer to File Number SR-Phlx-2020-02 and should be submitted on or before February 20, 2020.

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.<sup>26</sup>

**J. Matthew DeLesDernier,**

*Assistant Secretary.*

[FR Doc. 2020-01647 Filed 1-29-20; 8:45 am]

**BILLING CODE 8011-01-P**

**TENNESSEE VALLEY AUTHORITY**

**North Alabama Utility-Scale Solar Environmental Impact Statement**

**AGENCY:** Tennessee Valley Authority.

**ACTION:** Notice of Intent.

**SUMMARY:** The Tennessee Valley Authority (TVA) intends to prepare an Environmental Impact Statement (EIS) for the proposed TVA-developed solar facility in Lawrence County, Alabama. The purpose of this EIS is to address the potential environmental effects associated with building, operating, and maintaining the solar facility, North Alabama Utility-Scale Solar Project, in Lawrence County, Alabama. The proposed facility would encompass approximately 3,000 acres. Public comments are invited concerning both

the scope of the EIS and environmental issues that should be addressed as part of this EIS.

**DATES:** Comments must be received or postmarked by March 2, 2020.

**ADDRESSES:** Written comments should be sent to Elizabeth Smith, NEPA Specialist, Tennessee Valley Authority, 400 W Summit Hill Drive #WT11B, Knoxville, Tennessee 37902. Comments may be sent electronically to [esmith14@tva.gov](mailto:esmith14@tva.gov).

**FOR FURTHER INFORMATION CONTACT:** Contact Elizabeth Smith by email at [esmith14@tva.gov](mailto:esmith14@tva.gov), by phone at (865) 632-3053, or by mail at the address above.

**SUPPLEMENTARY INFORMATION:** This notice is provided in accordance with the Council on Environmental Quality's regulations (40 CFR parts 1500 to 1508), TVA's procedures for implementing the National Environmental Policy Act (NEPA), and Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR part 800).

The proposed North Alabama Utility-Scale Solar facility, hereafter referred to as the project, would occupy two sites: Wheeler North and Wheeler South. The sites together encompass approximately 3,000 acres, and are located entirely in Lawrence County, Alabama. The Wheeler North site is within the city limits of Wheeler, Alabama, and is located approximately 3.6 miles southeast of Courtland, Alabama. The southern edge of the Wheeler North site is paralleled by US Highway 72. The Wheeler North site is mostly cultivated crop fields with portions of forested areas. The Wheeler South site is the larger of the two sites and runs along the eastern portion of State Highway 33 with County Road 85 running west in the southwest portion of the site. The Wheeler South site is located 0.21 miles southwest of Wheeler, Alabama and 2.25 miles southeast of Courtland, Alabama. The Wheeler South site is mostly forested with portions of cultivated crop fields and wooded private residences. Two power line easements run through the Wheeler South site.

**Background**

TVA is a federal agency and instrumentality of the United States of America, created in 1933 by an act of Congress to foster the social and economic well-being of the residents of the Tennessee Valley region. As part of its diversified energy strategy, TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind,

<sup>25</sup> 15 U.S.C. 78s(b)(3)(A)(ii).

<sup>26</sup> 17 CFR 200.30-3(a)(12).



biomass, fossil fuel, and nuclear. In June 2019, TVA released the final 2019 Integrated Resource Plan (IRP) and associated Environmental Impact Statement, which updated the 2015 IRP. The 2019 IRP is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. The target supply mix adopted by TVA in the 2019 IRP envisions the addition of up to 14 GW of solar by 2038.

### Alternatives

In addition to a No Action Alternative, this EIS will address alternatives that meet the purpose and need for the project. In evaluating alternatives, TVA will also consider the availability of other potential sites where the project could be located. For the proposed site, TVA plans to consider the establishment of a reduced footprint so that impacts to cultural and/or biological resources could be avoided. The EIS will also evaluate ways to mitigate impacts that cannot be avoided. The description and analysis of these alternatives in the EIS will inform decision makers, other agencies, and the public about the potential for environmental impacts associated with the proposed solar facility. TVA solicits comment on whether there are other alternatives that should be assessed in the EIS.

### Proposed Resources and Issues To Be Considered

Public scoping is integral to the process for implementing NEPA and ensures that (1) issues are identified early and properly studied, (2) issues of little significance do not consume substantial time and effort, and (3) the analysis of identified issues is thorough and balanced. This EIS will identify the purpose and need of the project and will contain descriptions of the existing environmental and socioeconomic resources within the area that could be affected by the proposed solar facility, including the documented historical, cultural, and environmental resources. Evaluation of potential environmental impacts to these resources will include, but not be limited to, water quality, air quality, soil erosion, floodplains, aquatic and terrestrial ecology, threatened and endangered species, botany, wetlands, visual resources, transportation, safety, land use, historic and archaeological resources, recreation, geology, solid and hazardous waste, and socioeconomic and environmental justice issues. The final range of issues to be addressed in the environmental review will be determined, in part, from scoping comments received. TVA is

particularly interested in public input on other reasonable alternatives that should be considered in the EIS. The preliminary identification of reasonable alternatives and environmental issues in this notice is not meant to be exhaustive or final.

### Public Participation

The public is invited to submit comments on the scope of this EIS no later than the date identified in the **DATES** section of this notice. Federal, state and local agencies and Native American Tribes are also invited to provide comments. After consideration of comments received during the scoping period, TVA will develop and distribute a scoping document that will summarize public and agency comments that were received and identify the schedule for completing the EIS process. Following analysis of the issues, TVA will prepare a draft EIS for public review and comment; the draft EIS is scheduled for completion in 2021. In finalizing the EIS and in making its final decision, TVA will consider the comments that it receives on the Draft EIS.

**Authority:** 40 CFR 1501.7.

**M. Susan Smelley,**

*Director, Environmental Compliance and Operations.*

[FR Doc. 2020-01604 Filed 1-29-20; 8:45 am]

**BILLING CODE 8120-08-P**

## DEPARTMENT OF TRANSPORTATION

### Federal Motor Carrier Safety Administration

[Docket No. FMCSA-2014-0071]

### Hours of Service of Drivers: McKee Foods Transportation, LLC, Application for Exemption

**AGENCY:** Federal Motor Carrier Safety Administration (FMCSA), DOT.

**ACTION:** Notice of application for renewal of exemption; request for comments.

**SUMMARY:** FMCSA announces that it has received an application from McKee Foods Transportation, LLC (MFT) for a renewal of its exemption from the hours-of-service (HOS) regulation pertaining to the use of a sleeper berth. The exemption renewal would allow MFT team drivers to take the equivalent of 10 consecutive hours off duty by splitting sleeper berth time into two periods totaling 10 hours, provided neither of the two periods is less than 3 hours. MFT currently holds an exemption for the period March 27,

2015, through March 27, 2020. FMCSA requests public comment on MFT's application for exemption. The application for a renewal is available for review in the docket referenced at the beginning of this notice.

**DATES:** Comments must be received on or before March 2, 2020.

**ADDRESSES:** You may submit comments identified by Federal Docket Management System (FDMS) Number FMCSA-2014-0071 by any of the following methods:

- *Federal eRulemaking Portal:* [www.regulations.gov](http://www.regulations.gov). Follow the online instructions for submitting comments.
- *Mail:* Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue SE, West Building, Ground Floor, Room W12-140, Washington, DC 20590-0001.
- *Hand Delivery or Courier:* West Building, Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* 1-202-493-2251.

• Each submission must include the Agency name and the docket number for this notice. Note that DOT posts all comments received without change to [www.regulations.gov](http://www.regulations.gov), including any personal information included in a comment. Please see the *Privacy Act* heading below.

**Docket:** For access to the docket to read background documents or comments, go to [www.regulations.gov](http://www.regulations.gov) at any time or visit Room W12-140 on the ground level of the West Building, 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., ET, Monday through Friday, except Federal holidays. The on-line Federal Docket Management System is available 24 hours each day, 365 days each year.

**Privacy Act:** In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its rulemaking process. DOT posts these comments, without edit, including any personal information the commenter provides, to [www.regulations.gov](http://www.regulations.gov), as described in the system of records notice (DOT/ALL-14 FDMS), which can be reviewed at [www.dot.gov/privacy](http://www.dot.gov/privacy).

**FOR FURTHER INFORMATION CONTACT:** Mr. Richard Clemente, FMCSA Driver and Carrier Operations Division; Office of Carrier, Driver and Vehicle Safety Standards; Telephone: (202) 366-4225. Email: [MCPSD@dot.gov](mailto:MCPSD@dot.gov). If you have questions on viewing or submitting material to the docket, contact Docket Services, telephone (202) 366-9826.

**SUPPLEMENTARY INFORMATION:**



## IMPEACHMENT TRIAL

# Bolton book takes center stage

By Lisa Mascaro, Eric Tucker and Zeke Miller

The Associated Press

WASHINGTON President Donald Trump's impeachment trial shifted swiftly to pointed, back and forth questioning Wednesday as Republicans strained to contain the fallout over John Bolton's forthcoming book, which threatens their hopes of ending the trial with a quick acquittal.

The day started simply enough. Three Republican senators asked Trump's legal team: If there was more than one motive for Trump's conduct in Ukraine, as he pushed for political investigations of Joe Biden, should the Senate still consider the Biden pressure an abuse of power?

White House lawyer Pat Philbin responded there's nothing wrong with the president acting on a personal as well as national interest. He declared the

charge against Trump "absurd."

Democratic Leader Chuck Schumer sparked lively debate asking whether the Senate could really render a fair verdict without calling Bolton or acting White House Chief of Staff Mick Mulvaney to testify.

"There's no way to have a fair trial without witnesses," responded Rep. Adam Schiff, the Democrat leading the prosecution for the House.

"Don't wait for the book. Don't wait 'til March 17, when it is in black and white to find out the answer to your question," Schiff told the Senate.

That publication date is now in doubt. The White House on Wednesday released a letter to Bolton's attorney objecting to "significant amounts of classified information" in the manuscript, including at the top secret level. Bolton and his attorney have insisted that the book

does not contain any classified information.

The White House action could delay the book's publication if Bolton, who resigned last September, Trump says he was fired, is forced to revise his draft.

Wednesday's questions ping-ponged in a spirited hours-long debate, a last gasp at closing arguments from the House prosecutors and Trump's defense ahead of critical voting this week.

Fielding the written questions, Chief Justice John Roberts asked them of Trump's accusers and defenders.

Senate Majority Leader Mitch McConnell privately told senators he doesn't yet have the votes to brush back Democratic demands for witnesses now that revelations from Bolton have roiled the trial.

Republican ideas for dealing with Bolton and his book were fizzling almost as soon as they arose

among them, a witness "swap" with Democrats or issuing a subpoena for Bolton's manuscript.

GOP senators are sternly warned by party leaders that calling Bolton as a witness could entangle the trial in lengthy legal battles and delay Trump's expected acquittal.

Philbin made exactly that case in his response to Democrats' first question: "This institution will effectively be paralyzed for months on end," he said.

Republican Sen. Susan Collins of Maine tried to give fresh momentum to a one-for-one witness deal saying it's "very important that there be fairness, that each side be able to select a witness or two." But Democrats dismissed those offers, especially as Republicans want to draw Joe Biden's son, Hunter, deeper into the proceedings.

"It's irrelevant. It's a distraction," said Schumer.

Bolton writes in a



White House deputy counsel Patrick Philbin answers the first question from the majority during the impeachment trial against President Donald Trump in the Senate at the U.S. Capitol on Wednesday. [SENATE TELEVISION VIA AP]

forthcoming book that Trump told him he wanted to withhold military aid from Ukraine until it helped with investigations into Democratic rival Joe Biden. That assertion, if true, would undercut a key defense argument and go to the heart of one of the two articles of impeachment against the president.

"I think Bolton probably has something to offer us," said Sen. Lisa Murkowski, R-Alaska. She met privately Wednesday with McConnell.

Trump disagreed in a tweet Wednesday in which he complained that Bolton, after he left the White House, "goes out

and IMMEDIATELY writes a nasty & untrue book. All Classified National Security."

The uncertainty about witnesses arises days before crucial votes on the issue. In a Senate split 53-47 in favor of Republicans, at least four GOP senators must join all Democrats to reach the 51 votes required to call witnesses, decide whom to call or do nearly anything else in the trial.

Collins, Murkowski and Utah Sen. Mitt Romney signaled an interest in calling Bolton or other witnesses and questions and answers at times appeared directed directly at them.

## ALLIANCE

From Page A1

board. Then a couple years later, they started 'Cash for College,' which was the big FAFSA (Free Application for Federal Student Aid) push. It has taken the schools a while to get that done, but we pursued it and we depend heavily on our resources in the community to help us work on that."

The alliance report

pointed out that help was offered to those families encountering difficulties in what can be a complicated application process for federal student aid.

Ryan said Sheffield High's push to improve, the students became excited about the possibility of going to college, and became less fearful of the process involved.

"We work hard to keep them motivated, believing they can achieve a college

education," she said.

Sheffield Superintendent Keith Davis said the highlighting of Sheffield in the Business Alliance of Alabama report makes a strong statement: "We expect our students to perform at the highest level and are committed to providing opportunities for them to do that."

The Alabama Commission on Higher Education maintains the data on how many of those students

actually follow through and enroll in college.

Ryan said Sheffield's numbers are much improved in that category as well.

The report, which also takes into account research findings by the Public Affairs Research Council and A+ Education Partnership, looked at the state's career and technical education programs. It encourages policymakers to develop a more meaningful

college and career readiness measurement.

Alabama Workforce Council Chairman Tim McCartney applauds the state's ambitious goal of training 500,000 skilled workers, but added that preparing workers must come first.

"It is equally important the workers gain the critical skills they need to be competitive in the workplace," he said.

Career Technical

Education certification is the fastest growing method in the state for students to earn the college and career readiness designation.

However, the report's findings show a need for all certificates to rise to the level of rigor that demonstrates that state of readiness.

*lisa.singleton\_rickman@TimesDaily.com or 256 740 5735. Twitter@TDLRickman.*

## PERMITS

From Page A1

Currently, each county has its own permit system which is run through the sheriff's office. Alabama citizens can get an one-year or five-year permit if he or she has not been convicted of any disqualifying crimes.

Convictions of any Class A or B felony involving serious physical injuries, such as murder, rape, robbery, burglary or kidnapping, prohibit a permit.

The Bureau of Alcohol, Tobacco and Firearms (ATF) announced last year that Alabama's concealed carry permits would no longer be accepted as proof of a criminal background check at federally licensed gun shops.

An investigation from the U.S. Department of Justice discovered that some sheriffs were issuing permits to people without a full background check, or even when the National Instant Criminal Background Check System denied the application.

Robertson said he thinks this new database would restore the ATF's faith in Alabama's permit system.

"With this system, I believe the ATF will start accepting them again," Robertson said.

Gun rights groups, however, believe Robertson's bill is an unnecessary burden to law-abiding gun owners in Alabama.

"Why is it always that the law-abiding citizen has to go through more hoops

and have their name added to another registry when they are not the problem?"

Chuck Wright, a board member for BamaCarry, asked Alabama Daily News.

Wright is also worried about the third-party vendor meant to design and maintain the database could potentially share private information about gun-owning Alabamians.

"There is going to be a third party that administers that," Wright said. "That means you're going to have people who are not law enforcement who will have that information."

But Robertson says this new database is not about creating a registry of gun owners in the state.

"We're not collecting any information that's different from what has been done for many years," Robertson said. "We're not collecting any information in reference to your weapon or what they would be carrying."

Wright said current permit-carrying citizens shouldn't have to submit to changes when it's the state's problem to fix.

"All it is, is for the state to fix something at the cost of citizens and it's going to take money away from sheriffs," Wright said.

Currently, each county sheriff sets up their own permit costs and those funds go to support their offices.

House Bill 39 would also create a lifetime permit that law-abiding citizens could purchase for \$200. Sheriffs would still be allowed to set

the price for the one-year and five-year permits.

Robertson said he expects some sheriffs to have a problem with the bill since it could possibly cut their revenue from gun permits, but he wants to make sure everyone has easier access to gun permits.

"Many people are sick of coming year after year to pay for something they have to renew when they know they haven't been arrested for anything," Robertson said. "My goal is to lessen the burden on the average citizen."

To lessen the revenue loss, Robertson said the bill also includes a \$50 court fee for anyone, no matter if they have a concealed carry permit or not, who is convicted of domestic violence, a violent felony, or is involuntarily committed by a probate judge. Those funds would be split between the courts and sheriffs.

"If sheriffs are concerned about losing funding, I get that, but I want to help fund them through the criminals, not the good guys when they simply want to carry their weapon and are law-abiding," Robertson said.

The bill stipulates the funds from the lifetime permits can only go toward maintaining the database. Robertson did not have an estimate of how much it would cost to maintain it.

Dana Ellis, chapter leader of the Alabama chapter of Moms Demand Action, a gun safety advocacy group, told Alabama Daily

Development, or BUILD, grant can be applied for this year.

The Lauderdale County Commission received a \$14.9 BUILD grant with the help of U.S. Sen. Richard Shelby to widen U.S. 72 from Indian Springs to west of the Shoal Creek Bridge.

Barnes said they also may consider an Infrastructure For Rebuilding America or INFRA grant to fund the construction.

*russ.corey@timesdaily.com or 256 740 5738. Twitter@TD\_RussCorey*

the best locations along the rail line that passes through Tusculumbia and Sheffield, then narrowing those locations to the three best.

Discussions with the stakeholders, primarily the cities of Sheffield and Tusculumbia, will be held and a final location will be selected. Volkert will then provide a cost projection for the overpass and assist in applying for grant money to construct the overpass.

The timeline is structured so a Better Utilizing Investments to Leverage

News they want to make sure Alabama's permitting system is effective in protecting citizens.

"A strong permitting system is an essential part of responsible gun ownership," Ellis said. "We plan to keep an eye on this bill as we learn more about how it would affect our permitting system."

In previous years, some Alabama lawmakers have tried to do away with

carrying permits altogether, and make Alabama a "constitutional carry" state, but those efforts have failed to get passed in the State House multiple times.

Sen. Gerald Allen, R-Tuscaloosa, has pre-filed the bill again this year.

Sheriffs and various law enforcement have said concealed carry permits are a necessary tool that they use to keep the public safe.

Ellis said their organization is also concerned about possible upcoming constitutional carry legislation.

"Overall, we'd prefer that lawmakers focus their attention on policies that would help reduce gun violence in Alabama, like extreme risk protection orders that give law enforcement the tools to remove guns in crisis situations," Ellis said.

## Request for Public Comment



### North Alabama Utility-Scale Solar Project Environmental Impact Statement

The Tennessee Valley Authority (TVA) intends to prepare an Environmental Impact Statement (EIS) for the proposed TVA-developed solar facility in Lawrence County, Alabama. The purpose of this EIS is to address the potential environmental effects associated with building, operating and maintaining a solar facility, the North Alabama Utility-Scale Solar Project, in Lawrence County, Alabama. The proposed facility would encompass approximately 3,000 acres. Public comments are invited concerning both the scope of the EIS and environmental issues that should be addressed as part of this EIS.

This EIS will identify the purpose and need of the project and will contain descriptions of the existing environmental and socioeconomic resources within the area that could be affected. Evaluation of potential cumulative environmental impacts to these resources would include, but not be limited to, water quality, soil erosion, floodplains, aquatic and terrestrial ecology, threatened and endangered species, botany, wetlands, land use, historic and archaeological resources, as well as solid and hazardous waste, safety, socioeconomic, and environmental justice issues.

In addition to a No Action Alternative, this EIS will address alternatives that meet the purpose and need for the project. In evaluating alternatives, TVA also will consider the availability of other potential sites where the project could be located. For the proposed site, TVA plans to consider the establishment of a reduced footprint so that impacts to cultural and/or biological resources could be avoided. The EIS also will evaluate ways to mitigate impacts that cannot be avoided. The description and analysis of these alternatives in the EIS will inform decision-makers, other agencies and the public about the potential for environmental impacts associated with the proposed solar facility. TVA solicits comment on whether there are other alternatives that should be assessed in the EIS.

#### Submitting Comments

TVA invites you to submit comments on the scope of this EIS no later than Feb. 28, 2020. Any comments received, including names and addresses, will become part of the administrative record and will be available for public inspection.

Comments should be sent to:  
Tennessee Valley Authority  
ATTN: Elizabeth Smith, NEPA Specialist  
400 W. Summit Hill Drive, WT 11B-K, Knoxville, TN 37902

Email Comments Here: [esmith14@tva.gov](mailto:esmith14@tva.gov)  
For additional information: 865-632-3053

## STUDY

From Page A1

Barnes said representatives of Volkert have spent time in the area with members of the County Road Department and state Rep. Andrew Sorrell, R-Muscle Shoals, who supports the overpass effort.

"Hopefully, they will complete the transportation study in four or five months and after that go after grant opportunities," Barnes said.

Creekmore said the study involves finding



North Alabama Utility-Scale Solar EIS Scoping Report- Public Comments Summary

EIS Edit Warranted? (Y/N)	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
n/a	NOI	Public and Agency Involvement	The U.S. Geological Survey has no comment until the EIS is ready for review.	James Michael Norris, Manager of Environmental Document Review Program, USGS	TVA encourages USGS to comment on the upcoming Draft EIS.
n/a	NOI	Public and Agency Involvement	Request for more information on the "complete requirements" to participate.	Tommy Sykes	TVA encourages members of the public to participate in the NEPA process by providing comments on the EIS.
n/a	NOI	Public and Agency Involvement	Statement that complete answers to inquiries on the project site would be appreciated.	Ellen Hampton	In the course of planning the Project, TVA developed a communications schedule that warranted initial discussions with the landowner of the potential project site; the landowner then provided information to leasees of the property. Prior to these actions, the potential use of the project site as a solar facility was not released to the public.
n/a	NOI	Alternatives	Suggestion that other site locations be considered. Two commenters suggested that the former International Paper Company pulp & paper mill on the river in Courtland, the Muscle Shoals Reservation, the Colbert Steam Plant, the Widows Creek Steam Plant, or other former industrial or impervious sites be considered, due to selection of these sites being more environmentally beneficial than converting agricultural land to industrial. One commenter suggested that pasture land be considered instead of land used for row crops due to the topography being suitable for solar but less impactful to the local agricultural industry. Another commenter inquired whether a lease option was considered along with the stated intent to purchase the project site.	Phillip Badger; Tom Gerow, Jr.; Steve McGouyrk; Tommy Sykes	In the EIS, TVA will consider other potential sites where the Project could be located and will describe the potential project sites considered during the extensive site selection process. Potential sites include TVA-owned brownfield and greenfield properties as well as properties owned by other entities located in northern Alabama, western Tennessee, and northern Mississippi, due to the favorable topography in these areas.
n/a	NOI	Environmental Impacts, General	Request for information about the environmental impacts of the solar facility.	Tommy Sykes	The environmental impacts of the solar facility, including those associated with the cultural, social, and natural environment, will be assessed in the EIS being developed for the Project.
n/a	NOI	Land Use	Request that TVA not convert agricultural land to industrial, indicating that the project would constitute conversion of another large acreage of prime agricultural land in the region.	M J Aday	TVA will evaluate if development of the Project Site as a solar facility is compatible with current land use regulations. Potential impacts from changing land use within the Project Site from agricultural to industrial will be discussed in the EIS.
n/a	NOI	Prime Farmland	Concern for conversion of prime agricultural land due to loss of farm production, due to not being environmentally beneficial, and because of the limitation of suitable farm land in the Tennessee Valley. Statement that another Lauderdale County solar facility has a reputation as being one of the biggest areas of prime farmland in the Tennessee Valley and that the current project might repeat that "mistake."	M J Aday; Phillip Badger; Tom Gerow, Jr.; Steve McGouyrk	In accordance with Farmland Protection Policy Act evaluation procedures, TVA will complete a U.S. Department of Agriculture (USDA) Farmland Conversion Impact Rating Form for the Project Site in coordination with the USDA Natural Resource Conservation Service. Potential impacts to prime farmland will be discussed in the EIS.

North Alabama Utility-Scale Solar EIS Scoping Report- Public Comments Summary

EIS Edit Warranted? (Y/N)	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
n/a	NOI	Groundwater	Concern for the impact of the solar facility on groundwater and water supply in the Project vicinity.	Ellen Hampton	The environmental impacts of the proposed solar facility, including those associated with groundwater and water supply, will be assessed in the EIS being developed for the Project. The analysis will include evaluation of water needs during construction, operation, and maintenance of the solar facility, including the decision to use groundwater wells throughout the Project Site or water trucks to deliver water to the Project Site.
n/a	NOI	Biological Resources (Vegetation)	Statement that the use of forestry/timber lands would remove these from forestry production and would not be environmentally beneficial.	Tom Gerow, Jr.	TVA will evaluate the environmental impact of tree clearing for the Project versus taking no action in the EIS.
n/a	NOI	Air Quality	Statement that removing forests reduces the sequestration of CO2 from the atmosphere.	Tom Gerow, Jr.	TVA will evaluate the Project impact to GHGs and climate change in accordance with NEPA requirements as reflected in regulations, recent CEQ guidance, and case law pertaining to this portion of the review. This evaluation will include consideration of the potential loss of carbon sequestration due to the Project.
n/a	NOI	Cultural	NPS requested ongoing coordination in the project due to the proximity of the Deas-Whiteley Route of the Trail of Tears National Historic Trust and two National Register of Historic Places properties, Bride's Hill and the Joseph Wheeler Plantation District. NPS specifically offered to provide TVA with copies of the congressionally designated alignment of the Trail of Tears for the impact analysis. NPS additionally indicated that the project would be located in the Muscle Shoals National Heritage Area. NPS stated that they did not anticipate requesting Cooperating Agency status under the National Environmental Policy Act, but they may request to be a consulting party under the National Historic Preservation Act.	Ben West, Chief, Planning and Compliance Division, NPS	In December 2019, TVA initiated consultation under Section 106 of the National Historic Preservation Act with the Alabama Historical Commission and federally recognized tribes that have an interest in the Project vicinity. TVA held an onsite meeting with AHC staff to discuss the Project and the cultural resources survey. The layout and size of the proposed solar facility is pending the results of the cultural resources survey and other environmental reviews, as TVA intends to design the Project so that environmental resources, including cultural resources, are avoided to the maximum extent possible.
n/a	NOI	Cumulative Effects	Request for information on potential problems with solar facilities in the local region.	Tommy Sykes	The cumulative effects of the proposed solar facility, including those associated with past, present, and future projects in the Project Site vicinity, will be assessed in the EIS being developed for the Project.
Y	DEIS	Proposed Action Alternative (Site Design)	Request for information on "planted setbacks" and concern for visual effects to travelers on US 72 and the community, generally.	Lori Boston; Carol Coffey; Tim Guyse	The appearance and visibility of the proposed solar facility from the area surrounding the Project Site, including US 72 and other public roads, are described in detail in EIS Sections 3.7 and 3.10. Section 3.7 of the Final EIS also includes photographs showing the Project Site from nearby key observation points as well as photo-renderings showing the expected changes in the appearance of the Project Site from these key observations points following construction of the facility.

EIS Edit Warranted? (Y/N)	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
N	DEIS	Alternatives	Suggestion that other site locations and/or other power sources (nuclear, hydro, or coal) be considered. Two commenters suggested specific sites, such as the "International Paper site," or general site locations, such as rooftops and urban areas, be considered. A third commenter followed up with an article and discussion of other sources disputing the reliability of solar and other renewables. Three commenters compared the Project to the early February 2021 loss of power in Texas during a winter storm event, suggesting that the Project would result in high cost, unreliable energy.	John Bell; Carol Coffey; Tim Guyse; Connie Liverett	Section 2.3 of the EIS describes the process TVA used in selecting the Project Site. As described in Chapter 1 of the EIS, TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, coal, natural gas, and nuclear. In June 2019, TVA completed an Integrated Resource Plan (IRP) and associated Environmental Impact Statement (EIS). The 2019 IRP identified the various resources that TVA intends to use to meet the energy needs of the TVA region over a 20-year planning period, while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts. The 2019 IRP recommends the expansion of solar generating capacity of up to 14,000 megawatts (MW) by 2038. The Project would partially fulfill the renewable energy goals established in the 2019 IRP by providing cost-effective renewable energy. In planning its energy portfolio, TVA considered the intermittent availability of solar generation and is compensating for this by operating a diverse portfolio of types of generation, an adequate reserve margin to compensate for the loss of individual generating facilities, and a well-maintained interconnected transmission grid.
N	DEIS	Mitigation Measures	Request for information on the mitigation measures to be employed to ensure that there would not be a noticeable increase in herbicides in groundwater and streams.	Galia Peleg	The mitigation measures and best management practices that would be implemented by TVA, the eventual facility operator, and any associated contractors are described in Section 2.5 of the EIS. The descriptions of the anticipated impacts of the proposed action in Chapter 3 of the EIS incorporate the implementation of these mitigation measures and best management practices.
N	DEIS	Prime Farmland; Socioeconomics	Concern for the loss of prime agricultural acres and effects to and the viability of the surrounding community if the Project were built.	Carol Coffey; Tim Guyse	Effects to prime farmland was one of the factors considered during the site selection process, as described in Section 2.3 of the EIS. The evaluation of the proposed action on prime farmland using the USDA Form AD-1006 rating system, as described in Section 3.2.2 of the EIS, considers impacts to the project site as well as the larger surrounding farming community. While prime farmland impacts would be adverse for the duration of the Project, and those effects could indirectly affect the rural agricultural community, with decommissioning and removal of the solar facility, the Project Site could be returned to agricultural use with little loss of soil productivity and insignificant long-term effects on agricultural production.
N	DEIS	Water Resources	Request for information on possible water runoff as a result from installing solar panels (impervious surfaces).	Carol Coffey; Galia Peleg	The solar panels would be installed in north-south parallel rows and would rotate along this north-south axis towards the east or west as they track the movement of the sun. When in a flat (i.e., not rotated) position at mid-day, they would intercept rainfall from an area approximately approximately 3.4 feet wide. At maximum tilt, early in the morning and late in the afternoon, they would intercept rainfall from an area no more than two feet wide under wind-free conditions. This rain shadow area from which rainfall would be intercepted would be reduced under windy conditions. Rainfall hitting the panels would run off the lowest edge of the panels onto the vegetated ground below. Changes to groundwater infiltration and surface water runoff, as described in EIS Section 3.4.1, would be minimal following installation of the PV panels and revegetation of the project site. The possible increase in concentrated stormwater flow would be properly treated with either implementation of best management practices or by diverting the stormwater discharge to Project sedimentation basins and proper design of the stormwater conveyances to ensure adequate drainage.
N	DEIS	Water Resources	Statement that the proposed alternative does not address the ways in which the Tuscumbia-Fort Payne aquifer is replenished and whether permeable surface water is a significant source of its recharging.	Galia Peleg	As described in Section 3.4.1 and 3.17.3.3 of the EIS, the Tuscumbia-Fort Payne aquifer is recharged by water that infiltrates and percolates through the overlying unconsolidated material until it enters the bedrock and aquifer. The Tuscumbia-Fort Payne aquifer is known to have high recharge rates and high pumping rate for wells installed in the aquifer. As stated in Section 3.4 of the EIS, no direct adverse impacts to groundwater would be anticipated as a result of the Proposed Action given the characteristics of the aquifer. See the response to Comment No. 17 (the preceding comment in this table).

## North Alabama Utility-Scale Solar EIS Scoping Report- Public Comments Summary

EIS Edit Warranted? (Y/N)	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
N	DEIS	Threatened and Endangered Species; Wetlands	Statement that "EPA recommends that any additional conservation measures identified by the USFWS during consultation be included in the final EIS and/or ROD."	Mark Fite, Director of Strategic Programs Office, EPA	Section 1.4.4 of the EIS describes the USFWS consultations that occurred in relation to the Project. These are also presented in Section 3.5.4, where the effects to federally listed and state-listed are discussed.
N	DEIS	Wetlands	Statement that "EPA recommends any contractor working on site use BMPs and address any potential impacts to off-site streams and waterways" and that "site grading, excavation, and construction plans should include implementable measures to prevent erosion and sediment runoff from the project site during and after construction."	Mark Fite, Director of Strategic Programs Office, EPA	Section 2.5 of the EIS lists mitigation measures and best management practice. These measures would be employed by TVA, the solar facility operator, and all associated contractors during all phases of the construction and operation of the solar facility.
N	DEIS	Biological Resources	Request that the EIS should address in greater detail the roles that beavers play in the Tuscumbia Darter's habitat loss.	Carol Coffey	Beavers can be either beneficial or harmful, depending on the specific system in question. Although Tuscumbia darters are found in low numbers downstream of the Project footprint, this species is much more dependent on the 'spring run' habitat that is just downstream of the pond spring head. No beaver activity was observed at that location. This stream reach will be monitored for the life of the Project and if beaver activities hinder darter habitat then TVA and its partners will take any necessary actions to resolve the problem. Any beaver activity further downstream is not directly affecting prime Tuscumbia darter/round-rib elimia habitat at this time.
N	DEIS	Biological Resources (Vegetation)	Statement that "short vegetation" should be grown under the panels to reduce erosion and stabilize the moisture in the soil to prevent the footings from shifting.	Gordon Niessen	As described in Section 2.2.2 of the EIS, low-growing, native and/or non-invasive grasses and herbaceous plants would be planted and maintained under the solar panels. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the preconstruction conditions or the site is stable.
N	DEIS	Threatened and Endangered Species	Concern for the removal of 84 acres of potentially suitable summer roosting habitat for Indiana bat and northern long-eared bat.	Janice Barrett	TVA has designed the proposed solar facility in a manner that avoids and minimizes impacts to environmental resources, including habitat for tree-dwelling endangered or threatened bats, to the maximum extent possible. Per TVA's commitment in its Endangered Species Act Section 7 consultation with the U.S. Fish and Wildlife Service, trees would be removed in winter when endangered species of bats would not be present on the Project Site. A relatively large amount of forest would remain on the Project Site following construction.
N	DEIS	Cultural	Concern that archaeological sites would be affected by the project. One commenter stated, from the perspective of an avocational archaeologist, "there are numerous archaeological resources that will be destroyed" by the project.	Tim Guyse; Carol Coffey	As stated in Section 3.10 of the EIS and in compliance with the National Historic Preservation Act (NHPA), TVA designed the Project to avoid adverse effects or impacts to listed, eligible, undetermined, or potentially sensitive cultural resources. TVA would avoid all 16 archaeological sites determined eligible for listing on NRHP and the unnamed cemetery with at least a 100-foot buffer. TVA would also avoid the bluff line and the potential mound due to their undetermined eligibility status. Under Section 106 of the NHPA, TVA has consulted with AHC and federally recognized Indian tribes regarding TVA's NRHP eligibility determinations, findings of effect, and to develop avoidance and minimization efforts.
N	DEIS	Cultural	Concern why some architectural/aboveground cultural resources were studied and seemingly not others. One commenter indicated that only three locations were identified, yet many other locations exist in the area, including Wheeler Grove Baptist Church and the old Wheeler Elementary School. Another commenter mentioned a "house of historical significance in the middle of the proposed site" in Sunnybrook that should be considered in the study.	Carol Coffey; Tim Guyse	The survey for archaeological and above-ground cultural resources was designed and conducted in accordance with NHPA requirements and in consultation with the Alabama State Historic Preservation Office. The design and results of the survey are described in detail in Section 3.10 of the EIS. The survey was comprehensive and in the event that any cultural resources that were overlooked during the survey are discovered during the construction or operation of the solar facility, TVA will implement measures to avoid impacting those resources until their significance has been evaluated.

EIS Edit Warranted? (Y/N)	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
Y	DEIS	Cultural	<p>Request for additional information on the Trail of Tears, including the boundaries of the eligible segment, if impacts to the setting and feeling of the trail were considered, if any of the nearby historic resources date to a similar period as the trail, and if there would be restoration buffers between the trail alignment and the solar facility that may create a visual buffer.</p> <p>Following receipt of TVA's response, NPS responded that the information was appreciated and the official comment submitted into the NPS internal tracking system was that they did not anticipate any significant impacts to the Trail of Tears due to the Project.</p>	Meg Frisbie, Cultural Resources Specialist, National Trails, National Park Service	TVA provided a response to the NPS reviewer that is included in the appendices of the Final EIS. In the response, TVA summarized the NRHP status of the segment of the Trail of Tears that bisects the Project Site and its historical significance in the areas of ethnic heritage, military, and economics/transportation, during the period between 1832 and 1930. TVA indicated that the Alabama SHPO, a role served by the Alabama Historical Commission, similarly requested information on the association of the nearby cultural resources and the potential visual effects to surrounding historic properties, and TVA has responded to that request by engaging its contractors in additional documentation to consider the area as a potential rural historic district and in producing renderings of the proposed solar facility from several key aboveground historic properties, including the Trail of Tears. TVA has concluded that portions of the Project vicinity should be considered a historic district with a period of significance between 1818 and 1955. Portions of this rural historic district are intact, but other portions are fragmented in terms of both setting and feeling. In relation to the Trail of Tears, given the small portion of the resource that will be visible to the solar arrays, the obstruction of US 72, the establishment of a land buffer, and the low profile of the solar array, TVA maintains that, while there will be a visual effect, the effect is minimal.
Y	DEIS	Waste	Concern for waste associated with the solar facility and for battery disposal at the Project's end of life. One commenter indicated that the batteries may only have a 20-year life. Two commenters mentioned that disposing in area landfills may be an issue.	John Bell; Carol Coffey; Tim Guyse; Connie Liverett	<p>Section 3.12 of the EIS discusses waste management practices that the Project would follow. Generally, TVA and the facility operator would implement appropriate measures throughout the construction and operation of the Project to properly manage wastes. Consequently, the Proposed Action would not result in adverse effects from waste management.</p> <p>At this time, TVA is uncertain whether the Battery Energy Storage System will be constructed. If it is, the prevention of leaks would be handled onsite through appropriate containment and spill prevention measures. Other wastes, including batteries that are replaced during facility operation or when the system is decommissioned, will be disposed of offsite and/or recycled in accordance with manufacturer recommendations and appropriate regulations and industry best practices. See EIS Table 3-12.</p>
N	DEIS	Public Health and Safety	Question of whether the solar panels will cause any electromagnetic interruptions.	Lori Boston	According to a study published by North Carolina State University, solar photovoltaic technologies and solar inverters do not pose significant human health risks. Photovoltaic systems do generate electromagnetic fields (EMF). However, EMF produced by electricity has enough energy to produce heat but not enough to remove electrons from a molecule or damage DNA. Humans are exposed to EMF on an ongoing basis from such household items as refrigerators and microwave ovens with no impact to human health. Moreover, distance from the EMF source, such as provided by the solar panel setbacks and security fencing proposed to surround separate portions of the Project, renders the exposure to EMF insignificant and, therefore, not harmful to human health. The strength of the EMF present at the perimeter of a solar facility within a building is substantially lower than the typical exposures to EMF from household sources. The National Institute for Occupational Safety and Health, part of the Centers for Disease Control and Prevention, has a comprehensive webpage with links to scientific information and fact sheets on EMF ( <a href="https://www.cdc.gov/niosh/topics/emf/default.html">https://www.cdc.gov/niosh/topics/emf/default.html</a> ).



North Alabama Utility-Scale Solar EIS Scoping Report- Public Comments Summary

EIS Edit Warranted? (Y/N)	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
Y	DEIS	Socioeconomics	Request for information on how TVA will address potential land/property depreciation and property value impacts. One commenter stated that property owners "adjacent to the solar farm can expect land/property depreciation" and wondered how TVA will address this issue.	Lori Boston; Carol Coffey; Jamie Wallace	The Project is not expected to negatively affect area property values due to Project-implemented avoidance buffers. As discussed in the Visual Resources section of the EIS, Section 3.7, long-range views from residential farm complexes, historic properties, and churches in the Project Area are generally limited by mature trees framing property boundaries, nearby fields, and roads. These findings are supported by Figures 3-15, 3-16, and 3-17 in Section 3.7 of the Final EIS, which present renderings of the proposed solar facility from key observation points.
N	DEIS	General	Statement of general support for the project, including people who live near the Project Site.	Linda Gibson; Mike Ezell; Gordon Niessen	Comment noted.
N	DEIS	General	Alluded to concerns for Project construction impacts due to experiences from the solar facility in Colbert County, Alabama. The commenter listed the following complaints about the Colbert County facility: 24-hour noise; bright lights; large trucks damaging a minor road and creating mud and dust that is damaging their vehicles; and disrespectful employees.	Jamie Wallace	Construction details are given in Section 2.2.2 and impacts are addressed in the Affected Environment section for each resource area.
N	Other	General	Concern that a public comment period was not seemingly associated with the solar facility in Colbert County, Alabama. The commenter indicated that the 2000-plus-acre solar farm surrounds their property, and they did not know such a facility was eminent until the land was purchased.	Jamie Wallace	A draft of the EA for the solar facility in Colbert County (Muscle Shoals Solar) was released for 30-day public review and comment on July 15, 2019. It was also posted on TVA's public NEPA review website. A Notice of Availability, including request for comments on the Draft EA, was published in the Sunday edition of The Times Daily (ran on 7/21/19), which serves the Muscle Shoals area. Comments were accepted through August 15, 2019, via TVA's website, mail, and/or email. TVA has forwarded your concerns to the project manager for Muscle Shoals Solar.
N	DEIS	General	Request for the approximate location of the project.	Mike Ezell	The project area is illustrated in EIS Figures 1-1 and 2-1.
N	DEIS	General	Statement of concern about taxpayer dollars funding this project. One commenter suggested the "tax-payer outlay" would occur again in 20 years.	Connie Liverett; Carol Coffey	TVA is a corporate agency of the United States that receives no taxpayer funding. TVA derives virtually all of its revenues from sales of electricity to business customers and local power companies. Funding will be provided through TVA capital allocations generated by electricity sales throughout the TVA service area.
N	DEIS	General	Statement of concern about this project being built for Google. One commenter asked why would "we want to turn this over to Google." Another commenter indicated that this project would be a "great windfall for Google."	Connie Liverett; Carol Coffey	Unlike several other large solar generating facilities that TVA has announced in recent years, this facility is not designed to provide energy for a particular end user, such as Google, Facebook, or General Motors. The entities that will construct and operate the proposed solar facility have not yet been selected.
N	DEIS	General	Statement of concern about a Belgium company managing the project.	Connie Liverett; Carol Coffey	The entities that will construct and operate the proposed solar facility have not yet been determined.

TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	


PC #	PC-0001
Contact Date	1/8/2019 @ 1pm
Contact Name	David Coffee
Relationship	Neighbor

Contact Notes		
<p>Contact concerns</p> <ul style="list-style-type: none"> <li>- House is located north of 72 (old school house).</li> <li>- Concern over land use as his is looking to retire and doesn't want to live next to a power plant             <ul style="list-style-type: none"> <li>o Doesn't want to invest money in the house unnecessarily</li> </ul> </li> <li>- Biggest concern is over noise level</li> <li>- 4/17/2020 – Expressed concerns over lack of information (he said he gets all his information from local “gossip”. Also had concerns that he would not be given a chance to know what’s going on or provide public comment prior to construction. Requested more frequent communications on project progress.</li> <li>- 9/15/2020 – Mr. Coffee reached out to the owner property manager and requested the TVA Point of Contact (POC) because he could not find the contact information previously provided. He expressed concern over property boundary markers being removed during archeological investigation.</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>- Contact was very polite and understood the business transaction involved</li> <li>- Indicated that any heads up that could be provided would be appreciated since he’s looking at long-term retirement planning for him and his wife.</li> </ul>		
Contact Information		
<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;"></td> <td style="width: 50%;">Phone: [REDACTED]</td> </tr> </table>		Phone: [REDACTED]
	Phone: [REDACTED]	

Response
<ul style="list-style-type: none"> <li>- Explained that TVA would spend 1.5-2 years investigating the property for future use, and plans will not be developed until the environmental, cultural, and historical investigations have been performed</li> <li>- Expressed understanding for concerns and indicated that any future plans would take the concern over noise into consideration.</li> <li>- 1/15/2020 - left a message for a follow up conversation to explain the nature of the solar project.</li> <li>- 4/17/2020 – Follow up conversation concerning archeological digs taking place on Mr. Coffee’s land. Discussed current project timeline and NEPA survey process. Explained that no design work had been performed and so no solar farm size details could be provided. Had follow up conversation with archeological surveyor and provide maps specifying what land belonged to Mr. Coffee.</li> </ul>

<p style="text-align: center;">TENNESSEE VALLEY AUTHORITY TVA Solar 1</p>	
<p style="text-align: center;"><b>PUBLIC CONTACT RECORD</b></p>	


<ul style="list-style-type: none"> <li>- 9/18/2020 – Mr. Coffee and his wife have relocated full-time to the house in Lawrence Co. The TVAR crew inadvertently removed the property stakes when they removed their dig flags and he would like those replaced so that he can install fencing for containing cattle. Additional conversations surrounded concerns over beaver population, Pond Spring rehabilitation, and loss of native plants (namely field sorrel) in the area. He asked about the status of the project and it was explained that consultation with the SHPO is ongoing and public comment to the EIS would take place early next year. Overall a pleasant conversation.</li> <li>- 1/26/2021 – Called to inform landowner about EIS posting to EPA national register on 1/29/2021 and Public Meeting on 2/11/2021. Mr. Coffee is currently out of the country (deployed overseas in the Middle East) and will be until Feb. 13<sup>th</sup> or 14<sup>th</sup>. He requested a text with link to the website where he could pull up the EIS report so that he could review and comment as necessary.</li> </ul>		
<p>Responder</p>	<p>Robert Kulisek</p>	

TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	

PC #	PC-0003
Contact Date	1/8/2019 @ 3:45pm
Contact Name	Geneva Deloney
Relationship	Neighbor

Contact Notes	
<p>Contact concerns</p> <ul style="list-style-type: none"> <li>- House is “not on the river”, but she is living on the property with her son</li> <li>- Her concern was mainly over cutting down trees and maintaining replanted trees</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>- Contact was very polite</li> <li>- Impression was that she just wanted to talk</li> <li>- 1/15/2020 – Expressed concerns over any health impacts due to solar panels (she is a cancer survivor). Also she asked if we could get her better internet because she doesn’t have any other internet options and her current provider is overcharging her.</li> </ul>	
Contact Information	
	Phone: <span style="background-color: black; color: black;">[REDACTED]</span>

Response	
<ul style="list-style-type: none"> <li>- Explained that TVA would spend 1.5-2 years investigating the property for future use, and plans will not be developed until the environmental, cultural, and historical investigations have been performed.</li> <li>- Additional indicated that large scale tree clearing would not be a consideration due to the environmental, cultural, and historical impacts.</li> <li>- 1/15/2020 – follow up phone call to explain TVA’s intention for a solar farm</li> <li>- 1/26/2021 - Called to inform landowner about EIS posting to Federal Register on 1/29/2021 and Public Meeting on 2/11/2021. Ms. Geneva is currently in the hospital with pneumonia. Talked to Ms. Geneva’s daughter (Shea) and explained the project and what had already been explained to her mother previously. Ms. Shea did mention an Annie Mae Willingham Memorial Gardens (family cemetery) near her mom’s property, so TVA will follow up on ensuring that is not impacted.</li> </ul>	
Responder	Robert Kulisek

TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	


PC #	PC-0002
Contact Date	1/8/2020 @ 2:15pm
Contact Name	Ellen Hampton
Relationship	Neighbor

Contact Notes		
<p>Contact concerns</p> <ul style="list-style-type: none"> <li>- House is "off of Hwy 33"</li> <li>- Expressed concern over what the land will be used for</li> <li>- Biggest concern over existing water well used at her house and what impacts development may have on groundwater</li> <li>- Wants to ensure that development will take into account old-growth trees are preserved</li> </ul> <p>Notes:</p> <ul style="list-style-type: none"> <li>- 1/8/2020: Contact was very polite for initial conversation               <ul style="list-style-type: none"> <li>o Requested any updates as they are made available</li> </ul> </li> <li>- 2/19/2020: Contact sent email to Elizabeth Smith (TVA Environmental) in response to NEPA NOI and indicated that "untruthful communication" was previously provided during phone conversation</li> </ul>		
Contact Information		
<table border="1" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <div style="background-color: black; height: 1.2em; width: 100%;"></div>           Email: <div style="background-color: black; height: 1.2em; width: 100%;"></div> </td> <td style="width: 50%; vertical-align: top;">           Home Phone: <div style="background-color: black; height: 1.2em; width: 100%;"></div>            Cell Phone: <div style="background-color: black; height: 1.2em; width: 100%;"></div> </td> </tr> </table>	<div style="background-color: black; height: 1.2em; width: 100%;"></div> Email: <div style="background-color: black; height: 1.2em; width: 100%;"></div>	Home Phone: <div style="background-color: black; height: 1.2em; width: 100%;"></div> Cell Phone: <div style="background-color: black; height: 1.2em; width: 100%;"></div>
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Response		
<ul style="list-style-type: none"> <li>- Explained that TVA would spend 1.5-2 years investigating the property for future use, and plans will not be developed until the environmental, cultural, and historical investigations have been performed.</li> <li>- Expressed understanding for concerns and indicated that any future plans would take into account any groundwater impacts.</li> <li>- Additional indicated that large scale tree clearing would not be a consideration due to the environmental, cultural, and historical impacts.</li> <li>- 1/15/2020 - left a message for a follow up conversation to explain the nature of the solar project.</li> <li>- 2/28/2020 – Follow up conversation on future use of property (see email dated 2/28/2020)</li> <li>- 1/26/2021 – Called to inform landowner about EIS posting to EPA national register on 1/29/2021 and Public Meeting on 2/11/2021. Landowner requested a link to the website where she could view the EIS report.</li> </ul>		
<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">Responder</td> <td style="width: 50%;">Robert Kulisek</td> </tr> </table>	Responder	Robert Kulisek
Responder	Robert Kulisek	

TENNESSEE VALLEY AUTHORITY TVA Solar 1		
PUBLIC CONTACT RECORD		

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TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	

PC #	PC-0004
Contact Date	1/10/2020 @ 5:10pm
Contact Name	Don Heaps
Relationship	Neighbor

Contact Notes		
Contact concerns <ul style="list-style-type: none"> <li>- Just general question on what the letter was referring to and what TVA's plans are</li> </ul> Notes: <ul style="list-style-type: none"> <li>- Very cordial conversation. Contact was just looking for more information than what was provided in the letter.</li> </ul>		
Contact Information		
	<div style="background-color: black; width: 100%; height: 1.2em;"></div>	Phone: <div style="background-color: black; width: 100%; height: 1.2em;"></div>

Response		
<ul style="list-style-type: none"> <li>- Explained that TVA would spend 1.5-2 years investigating the property for future use, and plans will not be developed until the environmental, cultural, and historical investigations have been performed.</li> <li>- 1/15/2020 - left a message for a follow up conversation to explain the nature of the solar project.</li> <li>- Called to inform landowner about EIS posting to EPA national register on 1/29/2021 and Public Meeting on 2/11/2021. No concerns or further comments.</li> </ul>		
Responder		Robert Kulisek



TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	

PC #	PC-0005
Contact Date	1/16/2020 @ 10:00 am
Contact Name	Kenna Etheredge
Relationship	Neighbor

Contact Notes	
Contact concerns: <ul style="list-style-type: none"> <li>- Concern over developing on neighboring land</li> </ul> Notes: <ul style="list-style-type: none"> <li>- Very polite and respectful. Pleasant conversation.</li> <li>- Does not live on the land</li> <li>- "Area is being investigated by ADEM for all the 3M dumping"</li> <li>- Received a letter from ADEM a few years ago             <ul style="list-style-type: none"> <li>o Mountain Home Road</li> <li>o Several illegal dump sites</li> </ul> </li> <li>- <a href="https://whnt.com/2019/03/15/3m-bought-up-undisclosed-industrial-waste-dumping-sites-in-lawrence-county-neighbors-wondering-why/">https://whnt.com/2019/03/15/3m-bought-up-undisclosed-industrial-waste-dumping-sites-in-lawrence-county-neighbors-wondering-why/</a></li> </ul>	
Contact Information	
<div></div>	<div> <div>Phone:</div> <div>Email:</div> </div>

Response	
<ul style="list-style-type: none"> <li>- Explained that TVA would spend 1.5-2 years investigating the property for future use, and plans will not be developed until the environmental, cultural, and historical investigations have been performed.</li> <li>- Explained the nature of the solar project.</li> <li>- 1/26/2021 - Called to inform landowner about EIS posting to EPA national register on 1/29/2021 and Public Meeting on 2/11/2021. Request was made to email information on website and public meeting, when available.</li> </ul>	
Responder	Robert Kulisek

TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	

PC #	PC-0006
Contact Date	1/16/2020 @ 11:15 am
Contact Name	Doug Terry
Relationship	Neighbor

Contact Notes		
Contact concerns: - Just wanted to know exactly which Legrand property was looking at being developed Notes: - Very personable - Excited about development in Lawrence Co		
Contact Information		
	<div style="background-color: black; width: 100%; height: 1.2em;"></div>	Phone: <div style="background-color: black; width: 100%; height: 1.2em;"></div>

Response		
- Explained that TVA would spend 1.5-2 years investigating the property for future use, and plans will not be developed until the environmental, cultural, and historical investigations have been performed. - Explained the nature of the solar project. - Called to inform landowner about EIS notice of availability posting to Federal Register on 1/29/2021 and Public Meeting on 2/11/2021. Requested something to be mailed to his house.		
Responder		Robert Kulisek

**From:** [Norris, J. Michael](#)  
**To:** [Janowicz, Jon A](#); [Smith, Elizabeth](#)  
**Subject:** Fw: ENVIRONMENTAL REVIEW (ER) NEW POSTING NOTIFICATION: ER20/0043 - NOI EIS DOE TVA North Alabama Utility-Scale Solar Environmental Impact Statement, Lawrence County, Alabama Region 2  
**Date:** Friday, January 31, 2020 2:46:29 PM

---

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The U.S. Geological Survey has no comment until the EIS is ready for review.  
J. Michael Norris

James Michael Norris (Mike)  
Water Mission Area  
Office of Quality Assurance  
Manager of Environmental Document Review Program

[REDACTED]

---

**From:** oepchq@ios.doi.gov <oepchq@ios.doi.gov>


**Sent:** Thursday, January 30, 2020 10:13 AM

**To:** [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

**Subject:** ENVIRONMENTAL REVIEW (ER) NEW POSTING NOTIFICATION: ER20/0043 - NOI EIS DOE TVA North Alabama Utility-Scale Solar Environmental Impact Statement, Lawrence County, Alabama Region 2

This e-mail alerts you to a Environmental Review (ER) request from the Office of Environmental Policy and Compliance (OEPC). This ER can be accessed [here](#). To access electronic ERs visit the Environmental Assignments website: <https://ecl.doi.gov/ERs.cfm>. For assistance, please contact the Environmental Review Team at 202-208-5464.

Comments due to Agency by: 03/02/20

TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	

PC #	PC-0007
Contact Date	1/31/2020
Contact Name	Tommy Sykes
Relationship	Landowner

Contact Notes		
<p>Email from Mr. Sykes to TVA's Elizabeth Smith (NEPA):</p> <p>I am a land owner in Lawrence county (Hillsboro Community). I'm requesting information relating to all potential and known problems in its entirety associated with the installations of the solar panels in this particular area.</p> <p>Also, I would like to know if other properties were taken into consideration along with leasing as opposed to buying?</p> <p>I appreciate any and all information that you can provide me with in time for several other responses prior to the deadline scheduled for the latter part of February 2020.</p> <p>Thank you in advance.</p> <p>Sincerely, Tommy Sykes</p>		
Contact Information		
	Hillsboro community	Email: <span style="background-color: black; color: black;">[REDACTED]</span>

Response		
<p>1/31/2020 - Letter provided (see attached)</p> <p>1/26/2021 – Email update provided</p>		
Responder		Elizabeth Smith

TENNESSEE VALLEY AUTHORITY TVA Solar 1	
<b>PUBLIC CONTACT RECORD</b>	

PC #	PC-0008
Contact Date	2/11/2020 @ 10:25am
Contact Name	Burt Kerry
Relationship	Farmer/Neighbor

<b>Contact Notes</b>	
<p>Current land lease farmer is interested in establishing a relationship with TVA to provide land clearing services for the Lawrence Co property. R&amp;B Farms has heavy equipment (bull dozers and track hoes) as well as manpower for land clearing, site prep, and on-going maintenance activities.</p> <p>What pre-qualifications would R&amp;B Farms need to obtain to be considered for contracting with TVA?</p>	
<b>Contact Information</b>	
<div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px;"></div>	Phone: <div style="background-color: black; width: 100%; height: 15px; display: inline-block;"></div> Email: <div style="background-color: black; width: 100%; height: 15px; display: inline-block;"></div>

<b>Response</b>	
<p>2/12/2020 - TVA provided PM contact information and pledged to contact Farmer with more details once TVA Supply Chain is consulted based on request.</p> <p>1/26/2021 - Called to inform landowner about EIS posting to EPA national register on 1/29/2021 and Public Meeting on 2/11/2021. Mr Kerry indicated that a Gun Club was establishing a firing range west of Hwy 33 and would be interested in acquiring a small parcel of land to "square up" their range. Additionally he indicated a large solar developer looking to develop ~6500 acres NW of the LeGrande property. Mr Kerry indicated that they would be interested in partnering with the final PV facility operator to help them with their land management (mowing/herbicide application).</p>	
<b>Responder</b>	Robert Kulisek

**From:** [Smith, Elizabeth](#)  
**To:** [Tom Gerow](#)  
**Subject:** RE: Fed Register Comments on Wheeler AL Solar Project  
**Date:** Wednesday, February 12, 2020 9:42:00 AM  
**Attachments:** [image001.png](#)

---

Mr. Gerow,

Thank you for your comments on the North Alabama Utility-Scale Solar Project. TVA appreciates your input.

Sincerely,  
Elizabeth

**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
400 W. Summit Hill Drive  
Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Tom Gerow [REDACTED]  
**Sent:** Tuesday, February 11, 2020 9:02 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Fed Register Comments on Wheeler AL Solar Project

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Comments Submitted on the North Alabama Solar Project, Federal Register Notice 85 FR 5531, Document Number 2020-01604.

Elizabeth Smith, NEPA Specialist,  
Tennessee Valley Authority,  
400 W Summit Hill Drive #WT11B,  
Knoxville, Tennessee 37902.  
Comments sent via email to [esmith14@tva.gov](mailto:esmith14@tva.gov).

While it is commendable that the TVA is seeking to diversify its electricity-producing capabilities, the continued deforestation of productive timberlands, and loss of croplands/rangelands being converted to solar panels should be re-considered by the entire electric-energy industry and environmentally-minded advocates.

It is woefully ironic that thousands of acres of forests and agricultural lands in the U.S. are consumed under the premise of 'green energy' produced by wind turbines and solar panels. It seems questionable how removing forests and croplands from the landscape is a positive step towards 'renewable' and 'low impact' energy production. Taking forests away only reduces the ability to sequester CO2 from the atmosphere.

Particularly with this TVA proposal, the Wheeler project is located less than 5 miles from an abandoned industrial manufacturing site: the former International Paper Company pulp & paper mill on the river in Courtland. That former mill site should be prioritized for beneficial commercial/industrial re-use, in lieu of installing a solar array on a greenfield site that would convert forestland and ag fields to an industrial-scale, impervious-surface, commercial land use. It makes more common sense to adapt and 'recycle' large brownfield sites to support renewable energy production, instead of losing even more acres of renewable timber production and needed croplands. A collaborative partnership between the mill site's owner (IP Co.), the USEPA (to facilitate site remediation), the state of Alabama, and the TVA should yield a win-win-win outcome for the local community, rate payers, and the natural resources of northern Alabama. Perhaps the former mill operator could be provided an incentivized opportunity to convert its abandoned paper mill into a renewable energy production facility; either by installing solar arrays, and/or burning renewable wood pellets or chips to produce electricity into the TVA's grid.

I have no affiliation with the company, but am simply a 25-year practicing forester who continues to be troubled by more solar arrays taking away timberlands and farmland; while thousands of brownfields across the country sit in decay with no apparent concerted effort to reconstitute them into something productive. It would seem to be more sustainable and environmentally-mindful to retrofit large industrial/commercial rooftops and other existing impervious surface areas (parking lots) with solar arrays.

Thank you for the opportunity to comment on this proposal.

Tom Gerow, Jr. -- CESSWI, RF  
Cary NC

[REDACTED]



**From:** [Phil Badger](#)  
**To:** [Smith, Elizabeth](#)  
**Subject:** RE: Comments for EIS related to Lawrence County AL Utility Scale Solar Project\*  
**Date:** Monday, February 24, 2020 9:57:03 AM

---

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Please ignore the email sent previously and use this one

Elizabeth Smith, NEPA Specialist  
Tennessee Valley Authority  
Knoxville, TN

First, I applaud TVA for its use of renewable energy and TVA's consideration of power generation sites in Alabama.

Secondly, I want to respond to your request for comments regarding an EIS to be performed for TVA's Utility Scale Solar Project proposed to be built in Lawrence County AL. In reviewing the site, I note that most of the 3000 acres under consideration are currently in row crops. I doubt that TVA will use the relatively small portion of the 3000 acres for solar panels that are not currently in row crops. This assumption is made because it is obvious that using land suitable for row crops would have the lowest Solar Project construction costs.

Unfortunately, the Tennessee Valley is relatively limited in farmland suitable for row crops. The primary reason is because of rocky soil that prevents tillage of the land. On the flip side, there are literally thousands of acres in Tennessee and Alabama that are too rocky for tillage for row crops, but are suitable for pasture or hay crops. These are the types of lands that should be the focus of TVA. This is also a good compromise between row crop land and land that would be too rocky or steep or otherwise too difficult and expensive to use for a solar farm.

TVA already has a solar facility in Lauderdale County AL that was built on prime farmland known as "the bend in the river." The land where the Lauderdale County solar facility is located has a reputation as being one of the biggest areas of prime farmland in the Tennessee Valley. Let's not repeat the same mistake in Lawrence County and instead be good stewards of the land for current and future generations.

Phillip Badger  
[REDACTED]  
[REDACTED]

---

**From:** Phil Badger  
**Sent:** Monday, February 24, 2020 8:53 AM

**To:** esmith14@tva.gov

**Subject:** Comments for EIS related to Lawrence County AL Utility Scale Solar Project

Elizabeth Smith, NEPA Specialist  
Tennessee Valley Authority  
Knoxville, TN

First, I applaud TVA for its use of renewable energy and TVA's consideration of power generation sites in Alabama.

Secondly, I want to respond to your request for comments regarding an EIS to be performed for TVA's Utility Scale Solar Project proposed to be built in Lawrence County AL. In reviewing the site, I note that most of the 3000 acres under consideration are currently in row crops. I doubt that TVA will use the relatively small portion of the 3000 acres for solar panels that are not currently in row crops. This assumption is made because it is obvious that using land suitable for row crops would have the lowest Solar Project construction costs.

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TVA already has a solar facility in Lauderdale County AL that was built on prime farmland known as "the bend in the river." The land where the Lauderdale County solar facility is located has a reputation as being one of the biggest areas of prime farmland in the Tennessee Valley. Let's not repeat the same mistake in Lawrence County and instead be good stewards of the land for current and future generations.

Phillip Badger

[REDACTED]  
[REDACTED]

**From:** [M.J.Aday](#)  
**To:** [Smith, Elizabeth](#)  
**Subject:** Solar plant  
**Date:** Tuesday, February 25, 2020 10:13:58 AM

---

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No farms No food. Please don't destroy another 3000 acres of some of the best farmland in the South.

**From:** [Smith, Elizabeth](#)  
**To:** [RichardsonSeacat, Harriet](#)  
**Subject:** Fwd: Lawrence County Solar Project  
**Date:** Monday, March 2, 2020 7:16:00 AM

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For the admin record and scoping report.

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**From:** Dianne McGouyrk [REDACTED]  
**Sent:** Friday, February 28, 2020 4:43:33 PM  
**To:** Smith, Elizabeth <esmith14@tva.gov>  
**Cc:** Jerome McGouyrk [REDACTED]; Daniel [REDACTED]  
**Subject:** Lawrence County Solar Project

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Ms Smith,

Concerning the request for comments concerning the North Alabama Utility-Scale Solar Project, it is my belief that this project should be located somewhere else. It seems that the expenditure for this property, which seems to be prime for agriculture, is unnecessary when TVA already has several sites that could be used. Three specific sites I will mention are the Muscle Shoals Reservation, the Colbert Steam Plant, and the Widows Creek Steam Plant Sites. All three of these have considerable acreage that will never be available for much of anything else. It also seems that infrastructure to facilitate the energy feed into the grid would be readily available. One has to wonder why new property over existing property was chosen for this, was it politically motivated or was it done to financially benefit someone. Thanks for giving me the opportunity for comment.

Steve McGouyrk  
[REDACTED]

Sent from my iPad



# United States Department of the Interior



## NATIONAL PARK SERVICE

Atlanta Federal Center

1924 Building

100 Alabama Street, SW

Atlanta, GA 30303

IN REPLY REFER TO:  
I.A.2 (SERO-PC)

February 28, 2020

Elizabeth Smith  
NEPA Specialist  
Tennessee Valley Authority  
400 W. Summit Hill Drive, #WT11B  
Knoxville, TN 37902

Dear Ms. Smith:

The National Park Service (NPS) has reviewed the Tennessee Valley Authority (TVA) notice of intent (NOI) to prepare an environmental impact statement (EIS) to address the potential environmental effects associated with building, operating, and maintaining the North Alabama Utility-Scale Solar Project in Lawrence County, Alabama, within and near the unincorporated community of Wheeler. TVA has requested comments concerning the scope of the EIS and environmental issues that should be addressed in the EIS.

The Deas-Whiteley Route of the Trail of Tears National Historic Trail (NHT) runs through Wheeler, AL. Based on our review of the project location descriptions provided in the NOI, the two project sites are likely on either side of the Trail of Tears NHT at Wheeler, and the trail may be affected by the project. However, it is difficult to understand the location and boundaries of the proposed project areas, and any potential effects of the project on the Trail of Tears NHT, from the project location descriptions provided. Additional information regarding associated infrastructure from the project, such as electric transmission infrastructure and roads, was not included in the NOI.

Our initial review also indicates that two National Register of Historic Places properties - Bride's Hill, a Tidewater Cottage in the Tennessee Valley Thematic Resource, and the Joseph Wheeler Plantation District - may be affected by the project. Finally, the project would be located within the Muscle Shoals National Heritage Area.

Based on the information available, at this time NPS does not anticipate requesting Cooperating Agency status under National Environmental Policy Act for this project. However, as we are unsure whether or not there will be impacts to the Trail of Tears NHT or other resources where we may have jurisdiction or special expertise, the NPS would appreciate continued engagement on this project so that we may more thoroughly review project specifications as they become available and alert TVA to any potential issues at the earliest possible time. We may find upon further review that it may be appropriate for the NPS to be a consulting party under the National Historic Preservation Act. We look forward to our continued collaboration.

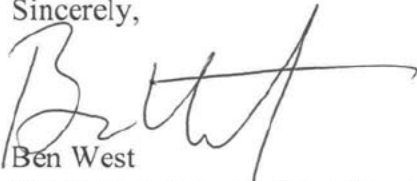
Interior Region 2 • South Atlantic-Gulf

Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi  
North Carolina, Puerto Rico, South Carolina, Tennessee, U.S. Virgin Islands

Therefore, please ensure that potential impacts to the Trail of Tears NHT are addressed in your analyses regarding the project, and that we are included in any applicable future correspondence. Please let us know if we can supply you with copies of the congressionally designated alignment of the trail for use in your analysis. Please direct questions to Jill Jensen, at [REDACTED]

[REDACTED] or [REDACTED]

Sincerely,

A handwritten signature in black ink, appearing to read 'Ben West', with a stylized, flowing script.

Ben West

Chief, Planning and Compliance Division

cc: Mrs. Lisa D. Jones, Alabama Historical Commission

**From:** [Linda Gibson](#)  
**To:** [Smith, Elizabeth](#)  
**Subject:** Solar farm in Lawrence Co  
**Date:** Saturday, January 23, 2021 6:25:33 PM

---

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Sent from my iPhone. My name is Linda Gibson , I live in Courtland,Al on County Rd 397 this is off Co Rd 150 going North .. I think this Solar Farm for Lawrence Co would be Great!! Our family is very supportive of this! Thanks for considering Lawrence County.



**From:** [Smith, Elizabeth](#)  
**To:** [J Wallace](#)  
**Subject:** RE: Solar  
**Date:** Tuesday, January 26, 2021 9:18:00 AM  
**Attachments:** [image001.png](#)

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Jamie,

Thank you for your input. A draft of the EA for the solar facility in Colbert County (Muscle Shoals Solar) was released for 30-day public review and comment on July 15, 2019. It was also posted on TVA's public NEPA review website. A Notice of Availability, including request for comments on the Draft EA, was published in the Sunday edition of The Times Daily (ran on 7/21/19), which serves the Muscle Shoals area. Comments were accepted through August 15, 2019, via TVA's website, mail, and/or email.

I've forwarded your concerns to the project manager for Muscle Shoals Solar.

Thanks again,  
Elizabeth

**Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.**

**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
400 W. Summit Hill Drive  
Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** J Wallace [REDACTED]  
**Sent:** Saturday, January 23, 2021 12:36 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Solar

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I saw info about public input regarding a solar farm in Lawrence county AL. Can you tell me why there was no public input for the one in Colbert County in Cherokee, AL?? We have a 2000+ solar farm in our front yard and surrounding us now with no heads up that it

was coming in until the land was purchased. There is 24 hour noise, bright lights, large trucks ruining the infrastructure which wasn't prepped for all of the usage (Mulberry Lane in a curvy 1 1/2 lane road), roads are ALWAYS muddy and dusty which is ruining our vehicles, employees are rude and have no consideration for the locals and our property value is diminishing away. Any input would be appreciated.

Jamie Wallace



**From:** [Smith, Elizabeth](#)  
**To:** [Mike Ezell](#)  
**Subject:** RE: Lawrence County Solar Farm  
**Date:** Friday, January 29, 2021 8:59:00 AM  
**Attachments:** [image001.png](#)  
[image003.png](#)

---

Mr. Ezell,

Thank you for reaching out in regard to the N. Alabama Utility-Scale Solar Facility in Lawrence County. More information can be found in the draft Environmental Impact Statement through the link below. I also attached a map to help identify the location of the project.

[https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/north-alabama-utility-scale-solar\\_draft-eis\\_body\\_and\\_appendices.pdf?sfvrsn=cfa626ad\\_4](https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/north-alabama-utility-scale-solar_draft-eis_body_and_appendices.pdf?sfvrsn=cfa626ad_4)

Thanks again,  
Elizabeth



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**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs

Tennessee Valley Authority  
400 W. Summit Hill Drive  
Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Mike Ezell [REDACTED]  
**Sent:** Thursday, January 28, 2021 4:12 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Lawrence County Solar Farm

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Great idea. Please state the approximate location. The more solar the better.

Mike Ezell  
[REDACTED]  
[REDACTED]

Sent from [Mail](#) for Windows 10

**From:** [Smith, Elizabeth](#)  
**To:** [Gordon Niessen](#)  
**Subject:** RE: North Alabama Utility-Scale Solar Project comment  
**Date:** Friday, January 29, 2021 9:03:00 AM

---

Mr. Niessen,

Thank you for your comment. It's been recorded.

Sincerely,  
Elizabeth

Elizabeth R. Smith  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
400 W. Summit Hill Drive  
Knoxville, TN 37902  
865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)

-----Original Message-----

From: Gordon Niessen [REDACTED]  
Sent: Wednesday, January 27, 2021 12:25 PM  
To: Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
Subject: North Alabama Utility-Scale Solar Project comment

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I feel it is a good idea for TVA to develop a solar project in that location. But it would be good if it were done in an environmentally sensitive way. Rather than have bare ground under the panels, it would be better if some short vegetation was allowed to grow for habitat for wildlife. This also reduces erosion and stabilizes the moisture in the ground that can help with preventing footings from shifting.

--

Thanks,

Gordon

**From:** [Smith, Elizabeth](#)  
**To:** [Harle, Michaelyn S](#); [RichardsonSeacat, Harriet](#)  
**Subject:** FW: North Alabama Utility-Scale Solar Facility Draft EIS  
**Date:** Wednesday, February 3, 2021 8:24:14 AM  
**Attachments:** [image001.png](#)

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My response...

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**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
400 W. Summit Hill Drive  
Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Smith, Elizabeth  
**Sent:** Wednesday, February 3, 2021 6:36 AM  
**To:** Frisbie, Margaret X <[Margaret\\_Frisbie@nps.gov](mailto:Margaret_Frisbie@nps.gov)>  
**Subject:** RE: North Alabama Utility-Scale Solar Facility Draft EIS

Meg,

Thank you for your questions on the N. AL Solar Project. I've forwarded those to our cultural specialist, and we'll be in touch.

Please consider joining our information session on Thursday, February 11, 2021, at 6pm CST. You can find more information on the project page:

<https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/north-alabama-utility-scale-solar-project>

Thanks again,  
Elizabeth

**Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.**

**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**

NEPA Specialist

NEPA Programs

Tennessee Valley Authority

400 W. Summit Hill Drive

Knoxville, TN 37902

865-632-3053 (w)

865-250-9138 (m)

[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Frisbie, Margaret X [REDACTED]  
**Sent:** Tuesday, February 2, 2021 5:00 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** North Alabama Utility-Scale Solar Facility Draft EIS

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Good afternoon Elizabeth,

I hope this email finds you well. My name is Meg Frisbie and I’m a cultural resources specialist with the National Park Service National Trails office. I received a copy of the North Alabama Utility-Scale Solar Facility Draft EIS for review and wanted to touch base with you briefly. The DEIS notes that the segment of the former Tuscumbia, Courtland, and Decatur Railroad associated with the Trail of Tears is eligible for listing in the NRHP under Criterion A. The report notes that there will be visual impacts to the National Historic Trail (NHT), but since the setting of the property has been compromised, there will be no adverse effect to the historic resource. Is there any additional information on the boundaries of this eligible segment? Since the setting will change from what is now largely agricultural, rural-residential with some modern development, and forested lands, to a large solar array, I'm curious if impacts to the setting and feeling of the trail were considered. Do any of the other architectural features from the Joseph Wheeler Plantation - or other nearby historic resources - date to a similar period as the Trail of Tears? I’m curious if any of the features of the plantation were present during the historic period of the late 1830s. Would there be restoration buffers between the trail alignment and the solar array that may create a visual buffer?

Thanks so much for your time!

Meg



Meg Frisbie  
Cultural Resources Specialist  
National Trails  
National Park Service

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED]

**From:** [Smith, Elizabeth](#)  
**To:** [Mike Ezell](#)  
**Subject:** RE: Lawrence County Solar Farm  
**Date:** Monday, February 8, 2021 11:56:00 AM  
**Attachments:** [image001.png](#)

---

Mike/Janice,

Forest removal would occur in small fragments across the site as opposed to taking out large sections of contiguous forest. Per our commitment in our Section 7 consultation with the US Fish and Wildlife Service, trees would be removed in winter when endangered species of bats and most migratory birds would not be present on site. A relatively large amount of forest would still remain on the Project Site following construction.

Thanks,  
Elizabeth

**Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.**

**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
400 W. Summit Hill Drive  
Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Mike Ezell [REDACTED]  
**Sent:** Saturday, February 6, 2021 12:51 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Fwd: Lawrence County Solar Farm

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Begin forwarded message:

**From:** Janice Barrett [REDACTED]  
**Date:** February 6, 2021 at 10:36:16 AM CST  
**To:** Maggie Johnston [REDACTED], Mike Ezell [REDACTED], Kim Waites [REDACTED], Joe Jenkins [REDACTED], Mark Johnston [REDACTED]  
**Subject:** Re: FW: Lawrence County Solar Farm

This project is huge, almost 3000 acres. It will require the cutting of 84 acres of forest, which "may be summer home to endangered bat species". Whether it is actually summer home to endangered species or not, cutting any forest for a solar farm is unacceptable. Forests themselves are endangered. Forest is our greatest asset against climate change and to eliminate a forest, no matter its size, even for a solar farm, is wrong.

My suggestion would be to make that solar farm 84 acres smaller and leave the trees alone.

Janice

---

**From:** Maggie Johnston [REDACTED]  
**Sent:** Thursday, February 4, 2021 2:15 PM  
**To:** Mike Ezell [REDACTED]; Janice Barrett [REDACTED]; Kim Waites [REDACTED]; Joe Jenkins [REDACTED]; Mark Johnston [REDACTED]  
**Subject:** Re: FW: Lawrence County Solar Farm

so cool! I'd like to go see this!  
Maggie

Margaret (Maggie) Johnston  
[REDACTED]  
Executive Director  
Wild Alabama  
[REDACTED]

[REDACTED]  
Wake up each morning with Joy and Thankfulness! Cherish each dawn!  
- Maggie ;-)

On Wed, Feb 3, 2021 at 4:02 PM Mike Ezell [REDACTED] wrote:

Though this might be of interest

Mike E.

Sent from [Mail](#) for Windows 10

---

**From:** [Smith, Elizabeth](#)  
**Sent:** Friday, January 29, 2021 8:00 AM  
**To:** [Mike Ezell](#)  
**Subject:** RE: Lawrence County Solar Farm

Mr. Ezell,

Thank you for reaching out in regard to the N. Alabama Utility-Scale Solar Facility in Lawrence County. More information can be found in the draft Environmental Impact Statement through the link below. I also attached a map to help identify the location of the project.

[https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/north-alabama-utility-scale-solar\\_draft-eis\\_body\\_and\\_appendices.pdf?sfvrsn=cfa626ad\\_4](https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/north-alabama-utility-scale-solar_draft-eis_body_and_appendices.pdf?sfvrsn=cfa626ad_4)

Thanks again,

Elizabeth

**Error! Filename not specified.**

***Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.***

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**Elizabeth R. Smith**

NEPA Specialist

NEPA Programs

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400 W. Summit Hill Drive  
Knoxville, TN 37902

865-632-3053 (w)

865-250-9138 (m)

[esmith14@tva.gov](mailto:esmith14@tva.gov)

**Error! Filename not specified.**

---

**From:** Mike Ezell [REDACTED]  
**Sent:** Thursday, January 28, 2021 4:12 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Lawrence County Solar Farm

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Great idea. Please state the approximate location. The more solar the better.

Mike Ezell

[REDACTED]

[REDACTED]

Sent from [Mail](#) for Windows 10



**From:** [Smith, Elizabeth](#)  
**To:** [Mike Ezell](#)  
**Subject:** RE: Lawrence County Solar Farm  
**Date:** Monday, February 8, 2021 11:56:00 AM  
**Attachments:** [image001.png](#)

---

Mike/Janice,

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Thanks,  
Elizabeth

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**Sent:** Saturday, February 6, 2021 12:51 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
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Sent from my iPhone

Begin forwarded message:



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**Date:** February 6, 2021 at 10:36:16 AM CST  
**To:** [REDACTED]

**Subject:** Re: FW: Lawrence County Solar Farm

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**From:** Maggie Johnston [REDACTED]  
**Sent:** Thursday, February 4, 2021 2:15 PM  
**To:** [REDACTED]  
[REDACTED]  
[REDACTED]  
**Subject:** Re: FW: Lawrence County Solar Farm

so cool! I'd like to go see this!  
Maggie

Margaret (Maggie) Johnston  
205-522-1500 - cell  
Executive Director  
**Wild Alabama**  
[REDACTED]

[REDACTED]  
Wake up each morning with Joy and Thankfulness! Cherish each dawn!  
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Mike E.

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**From:** [Smith, Elizabeth](#)  
**Sent:** Friday, January 29, 2021 8:00 AM  
**To:** [Mike Ezell](#)  
**Subject:** RE: Lawrence County Solar Farm

Mr. Ezell,

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[https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/north-alabama-utility-scale-solar\\_draft-eis\\_body\\_and\\_appendices.pdf?sfvrsn=cfa626ad\\_4](https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/environmental-stewardship/nepa-environmental-reviews/north-alabama-utility-scale-solar_draft-eis_body_and_appendices.pdf?sfvrsn=cfa626ad_4)

Thanks again,

Elizabeth

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**Elizabeth R. Smith**

NEPA Specialist

NEPA Programs

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865-632-3053 (w)

865-250-9138 (m)

[esmith14@tva.gov](mailto:esmith14@tva.gov)

**Error! Filename not specified.**

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**From:** Mike Ezell [REDACTED]  
**Sent:** Thursday, January 28, 2021 4:12 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Lawrence County Solar Farm

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Great idea. Please state the approximate location. The more solar the better.

Mike Ezell

[REDACTED]

[REDACTED]

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**From:** [Smith, Elizabeth](#)  
**To:** [Tim](#)  
**Subject:** RE: Courtland-Hillsboro proposed solar plant  
**Date:** Wednesday, February 10, 2021 8:12:00 AM  
**Attachments:** [image001.png](#)

---

Tim,

Thank you for your comment in regards to the North Alabama Utility-Scale Solar Facility.

TVA is conducting a virtual public information meeting on Thursday, February 11, 2021, beginning at 7:00pm CST. We'll be discussing the site selection process, as well as providing cultural information. If you'd like to join, please register through the project webpage:

<https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/north-alabama-utility-scale-solar-project>

Thanks,  
Elizabeth

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**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**  
NEPA Specialist

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Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Tim [REDACTED]  
**Sent:** Tuesday, February 9, 2021 11:07 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Courtland-Hillsboro proposed solar plant

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I oppose the building of the solar power mega-site in our community. The wheeler community will cease to exist if this monstrosity is built here. Besides, solar power in its current

state is not a financially feasible power source and constitutes a massive boondoggle on TVA's part. Stick to hydro, coal, and especially nuclear. A solar plant of this size has a limited lifespan and the waste involved at the end of that life will be a burden on TVA and the community. The money wasted on this project could be much better spent toward nuclear energy and would not ruin 3000 prime acres along a major thoroughfare in North Alabama. The drive from Decatur to the Shoals will never be the same if this goes forward. If TVA must bow to the gods of climate change then let them do it in a location that is less populated and off the beaten path.

I know the archaeological study has been performed because I know some of the scientists who work for the firm who performed the study and I observed the work as it was performed last year. I am not yet privy to the results but I know from personal experience that there are numerous archaeological resources that will be destroyed by such as massive project. As an avocational archaeologist myself and an officer in the Rebel State Archaeological society, as well as someone who grew up in Courtland, I am very familiar with the diversity of archaeological sites spread across the property being considered. Relics going back the Paleo period, 10,000+ years ago all the way through the Civil war period are found on this wheeler property. Multiple Confederate armies marched through and spent time in wheeler during the war. And as a Native American myself (1/12th) I have recovered many artifacts from the sites around wheeler/Sunnybrook, with permission. There is also a house of historical significance in the middle of the proposed site here in Sunnybrook not to mention Pond Springs, home of General Joe wheeler.

I urge TVA to not pursue this project in our community.

Respectfully,  
Tim Guyse

[REDACTED]  
[REDACTED] [REDACTED]

**From:** [Smith, Elizabeth](#)  
**To:** [RichardsonSeacat, Harriet](#)  
**Subject:** Fwd: solar panel project  
**Date:** Friday, February 12, 2021 9:57:54 AM

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**From:** Smith, Elizabeth <esmith14@tva.gov>  
**Sent:** Friday, February 12, 2021 9:56:29 AM  
**To:** [REDACTED]  
**Subject:** Re: solar panel project

Lori,

Thank you for your questions.

Based on comments received regarding the electromagnetic field associated with solar, TVA plans to include information on EMF in the final EIS.

TVA will also address the potential depreciation in the final EIS. We plan to have internal discussions on how best to analyze this potential impact.

Thanks again,  
Elizabeth Smith  
TVA NEPA Specialist

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---

**From:** [REDACTED]  
**Sent:** Thursday, February 11, 2021 8:37 PM  
**To:** Smith, Elizabeth  
**Subject:** solar panel project

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Good evening,

I have a few more additional questions about this project. Obviously land owners adjacent to the solar farm can expect land/property depreciation. How will TVA address this issue? Will there be any planted setbacks? Also, will the solar panels cause any electromagnetic interruptions?



Thanks for your time!  
Lori Boston

**From:** [Smith, Elizabeth](#)  
**To:** [REDACTED]  
**Subject:** RE: solar panel project  
**Date:** Friday, February 12, 2021 1:08:00 PM  
**Attachments:** [image001.png](#)

---

Lori,

After discussing your questions further, here's some additional information:

Socioeconomic Impacts to adjacent landowners:

Section 3.15 of the Draft EIS addresses impacts to socioeconomic conditions as a result of the Proposed Action. This section will be revised in the Final EIS to specifically address potential impacts to adjacent landowner property values.

Planted Setbacks:

Visual and avoidance buffers are discussed throughout the Draft EIS for environmental and cultural areas. For example, Figure 3-13 provides visual indication of buffer zones established for architectural resources. 100-600-FT buffers are incorporated in the preliminary site layout around cultural avoidance areas. As indicated in section 2.2.2, during construction activities, 50-FT buffers will be established jurisdictional wetlands and perennial and intermittent streams.

Electromagnetic Field Concerns:

According to NC State University, photovoltaic technologies and solar inverters do not pose significant human health risks. Photovoltaic systems do generate electromagnetic fields (EMF). However, EMF produced by electricity has enough energy to produce heat but not enough to remove electrons from a molecule or damage DNA. Humans are exposed to EMF on an ongoing basis with no impact to human health. Moreover, distance from the EMF source, such as provided by the security fencing proposed to surround separate portions of the Project, renders the exposure to EMF insignificant. There is a comprehensive fact sheet published by NIOSH concerning EMF and it is available on the CDC webpage dedicated to EMF awareness.

Thanks,  
Elizabeth

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**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
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Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)

[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Smith, Elizabeth <esmith14@tva.gov>  
**Sent:** Friday, February 12, 2021 9:56 AM  
**To:** [REDACTED]  
**Subject:** Re: solar panel project

Lori,

Thank you for your questions.

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TVA will also address the potential depreciation in the final EIS. We plan to have internal discussions on how best to analyze this potential impact.

Thanks again,  
Elizabeth Smith  
TVA NEPA Specialist

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---

**From:** [REDACTED]  
**Sent:** Thursday, February 11, 2021 8:37 PM  
**To:** Smith, Elizabeth  
**Subject:** solar panel project

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Thanks for your time!  
Lori Boston

**From:** [Smith, Elizabeth](#)  
**To:** ["Carol Coffey"](#)  
**Subject:** RE: TVA Solar Farm in Lawrence County AL  
**Date:** Tuesday, February 16, 2021 10:12:00 AM  
**Attachments:** [image001.png](#)

---

Mrs. Coffey,

Thank you for your comment on the North Alabama Utility-Scale Solar Facility Draft Environmental Impact Statement (EIS). Once the public comment period closes, TVA will analyze comments, conduct further research if a comment necessitates that, and prepare the final EIS.

The project webpage will be updated with the final EIS and Record of Decision.

Thanks,  
Elizabeth

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**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
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865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Carol Coffey [REDACTED]  
**Sent:** Saturday, February 13, 2021 9:59 AM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** TVA Solar Farm in Lawrence County AL

**This is an EXTERNAL EMAIL from outside TVA. THINK BEFORE you CLICK links or OPEN attachments. If suspicious, please click the "Report Phishing" button located on the Outlook Toolbar at the top of your screen.**

Dear Ms. Smith and TVA:

I wish for the following to become part of the record for your EIS.

I attended the online meeting on Thursday night which was a carefully controlled propaganda event instead of a method for the people to have any real input or get true answers as a public

meeting should be. As a person who has been to many, many public meetings, this could not even be closely described as a give and take as a public meeting is meant to be.

That being said, here are my questions and statements which I fully expect to become a part of your EIS.

1. Your archeologist Subject Matter Expert said you contracted with someone about the historical eligibility of buildings, locations, and cemeteries in the area, 50 years or older. Somehow you came up with three locations (shocker being a location the person selling you the land probably identified and a spot on the Historical Register), Pond Springs was number one on your list. The other two I understand. However, there are locations not even considered, that may not be historical to the Federal or State governments but are priceless to the people from the area (people who were not contacted, asked for input, or apparently considered). These include Wheeler Grove Baptist Church (established, funded and built by Miss Annie Wheeler), the old Wheeler Elementary School (one of five, land donated, established, funded and built by Miss Annie Wheeler), and other locations that also weren't even considered, but are priceless to residents of the area. The Wheeler School was auctioned when it closed and my Grandfather bought the land and the building and renovated it into a family home which now houses a fourth generation. Recently, it has been totally renovated to house the next upcoming generation (expected to be born at any minute) and now you plan to enclose it on four sides with NO viewguard as you mentioned in your presentation for other identified historically eligible locations, other than our own property boundaries. After moving from Huntsville to get AWAY from urban sprawl, metal and concrete and to enjoy pastoral sunsets, you are enclosing that beautiful property with metal, glass and batteries, killing not only the chances of wildlife and plant life in the area, but obliterating the currently beautiful view. And yes, we tried to buy the property surrounding us so this very thing could not happen, but Mr. Legrand told us he could not sell us anymore land because TVA had purchased an option to buy an enormous number of acres to include the land we were not able to purchase surrounding and across the highway from our property. So you are saying that you will take consideration for Mr. Legrand's family home, but not for the Coffey family home. As my great-grandparents, grandparents, parents and now my siblings have all called Wheeler home (and now our children and grandchildren), you are destroying it with NO CONSIDERATION for a legacy of farming and the beauty of the country that have been a part of my family going back to the early 1800s. How is it possible, our family property was not considered eligible as the building was erected in 1929? Nearly 100 years now.
2. Please explain how an organization that was created to provide affordable power to the Tennessee Valley (BTW my Grandfather and Great Uncles worked for the WPA building the Wheeler and Wilson dams) is sidestepping the cheapest and cleanest form of power currently in use through Browns Ferry and other plants, to use our tax dollars to buy land, build an expensive solar farm, for a private company (Google) and turn over management of it to a Belgian Company (obviously NOT having anything to do with me and/or my electric needs). Not to mention, solar farms start paying for themselves (because of initial capital expense) in about 20 years... about the time the batteries start deteriorating and in need of replacement. So then, in 20 years another huge capital outlay will have to happen to clean them out and replace them, resulting in another tax-payer outlay. What a great windfall for Google. Meanwhile the old, NON-RECYCLABLE panels and batteries are buried in the regional landfill down the road in

fairly close proximity to water supplies and agricultural activities. HOW can you justify a need for a solar farm for any of these reasons?

3. Your subject matter expert on the Tuscumbia Darter (which is nowhere close to Tuscumbia) and the small snail he was so proud of, did not even mention the true threats which would include any change in water runoff that will be created by taking away natural plant growth and installing solar panels, but also failed to identify the beavers as culprits of invasion of their habitat. As someone who has been swimming in the spring at Pond Springs and played in the spring which runs THROUGH our family property, it is obvious TVA did a cursory address of the darter and the snail. But except to say you will do your best to save them, you really have no real intention of doing it, because as they are not on the Federal Endangered list you have no true responsibility, or intention and that was painfully obvious even to your expert. You only addressed it at all for marketing propaganda. It is my contention it was brought up at all to see if the federal government could swoop in and stop your progress, not to actually save anything.
4. I do know that John Legrand's only goal is money. He doesn't live in Wheeler anymore and he doesn't care what you do to the land. Although his son lives adjacent to Pond Springs (in a location where my great-grandfather, my grandfather and my father were born, by the way, it appears he is not concerned about his son's proximity to the solar panels either. His Great Aunt would be shocked at his allowing this to happen, after all of the incredible things she did to save trees (you should ask about the highway she was able to have diverted to save a bunch of oak trees), save children, save the community and serve as a terrific leader. Those of us from the area, are shaking our heads at your proposed project, for reasons so vast, I can't think of ONE positive reason to have a solar farm. NOT ONE. And I'm not anti-solar power. I think on roofs in urban areas, in cities on property that can't be used for anything else. Put them in places where putting in metal and glass can only improve the property value. But not in a beautiful agricultural and forest setting where my ancestors have planted cotton, corn, soybeans and wheat for closing in on two hundred years. And do not use our taxes to pay for something that will line the pockets of Google and their shareholders, instead of actually providing us with cheap electricity. RIGHT NOW, in Wheeler, there is no cheap access to the internet. And I bet, even if you give Google all of this land for a solar farm, that will not change anytime soon.

I had other questions in direct response to your SMEs' presentations, but those were lost in your method of hiding/ identifying/ selecting questions to be answered, and only seen by the people who submitted them. I should have foreseen and kept copies, but you have taught me a lesson. Any future public meeting online, I will make sure to do that. I will forward any additional statements and questions by 15 March 2021.

**Respectfully,**

*Carol Coffey*

**From:** [Smith, Elizabeth](#)  
**To:** [John Bell](#)  
**Subject:** RE: electricity  
**Date:** Tuesday, February 16, 2021 10:07:00 AM  
**Attachments:** [image001.png](#)

---

Mr. Bell,

Thank you for your comment.

Elizabeth

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**Elizabeth R. Smith**  
NEPA Specialist

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Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** John Bell [REDACTED]  
**Sent:** Tuesday, February 16, 2021 10:06 AM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** electricity

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My brother lives west of Houston Texas, is experiencing rolling blackouts. His electricity provider told the users that the wind turbines are frozen. They are trying to deice with drones. The solar panels are covered with ice. Time to rethink going green.

If you must install a solar farm, The International Paper site makes a lot more sense

John Bell  
[REDACTED]

Sent from [Mail](#) for Windows 10



**From:** [Smith, Elizabeth](#)  
**To:** [Kulisek, Robert Patrick](#); [RichardsonSeacat, Harriet](#)  
**Subject:** FW: Check out this article on renewable energy  
**Date:** Tuesday, February 16, 2021 3:18:33 PM  
**Attachments:** [image001.png](#)

---

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FYI

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**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
400 W. Summit Hill Drive  
Knoxville, TN 37902

865-632-3053 (w)  
865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Rockman7 [REDACTED]  
**Sent:** Tuesday, February 16, 2021 11:50 AM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Fwd: Check out this article on renewable energy

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Thanks for the link to the information on the proposed Wheeler solar farmers m. This article reflects the opinion of most people around here whom I’ve spoken with (actually everyone I’ve spoken with).

Thanks  
Tim Guyse

Sent from my iPhone

Begin forwarded message:

**From:** Tim Guyse [REDACTED]

**Date:** February 15, 2021 at 8:45:44 PM EST

**To:** Rockman7 [REDACTED]

**Subject:** Check out this article at The Patriot Post

I thought you might be interested in the following link at The Patriot Post:

[https://patriotpost.us/articles/77681?mailing\\_id=5636](https://patriotpost.us/articles/77681?mailing_id=5636)

Sent from my iPad

**From:** [Smith, Elizabeth](#)  
**To:** [Connie Liverett](#)  
**Subject:** RE: Solar Farm Lawrence County  
**Date:** Wednesday, February 17, 2021 9:48:00 AM  
**Attachments:** [image001.png](#)

---

Ms. Liverett,

Thank you for your comment on the North Alabama Utility-Scale Solar Facility Draft Environmental Impact Statement (EIS). Once the public comment period closes, TVA will analyze comments, conduct further research if a comment necessitates that, and prepare the final EIS.

The project webpage will be updated with the final EIS and Record of Decision.

Thanks again,  
Elizabeth Smith

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**Elizabeth R. Smith**  
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[esmith14@tva.gov](mailto:esmith14@tva.gov)



---

**From:** Connie Liverett [REDACTED]  
**Sent:** Tuesday, February 16, 2021 11:01 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Solar Farm Lawrence County

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Ms. Elizabeth Smith, NEPA specialist

I just learned of a solar farm by TVA in Lawrence County. I live in Colbert County, and really do not want my tax dollars to be paid for this farm. Furthermore, why would we want to turn this over to Google and then be managed by a Belgian company?

I personally know engineers from TVA that are aware that the batteries in this solar farm only have a 20 year life. Then they would have to be disposed in landfills to further cause pollution. Is this really a green deal?

With all of the heating issues that 4 million people in my former state of Texas are having, are we going to burden people with higher utility bills and do without electricity and heat?

Sincerely,  
Connie Liverett



Attaching Rep Dan Crenshaw's review of Texas electrical issues:

With blackouts across Texas, many are wondering: what happened?

Leftists are cheering a "red state" having energy problems.

Here's the truth about what happened.

Summary:

A mix of over-subsidized wind energy and under-investment in gas power means we didn't have enough base load energy for a massive spike in demand.

Also, Texas infrastructure isn't designed for once-in-a-century freezes.

#1 - Frozen Wind Turbines:

West Texas had wind turbines that had to be de-iced. The little energy that power regulators planned on being supplied from wind was now gone.

We have almost 31GW of wind installed on the grid, but on Monday we couldn't even depend on 6 GW working.

To make matters worse, existing storage of wind energy in batteries was also gone, because batteries were losing 60% of their energy in the cold.

Bottom line: renewables don't work well in extreme weather. Never will.

This is what happens when you force the grid to rely in part on wind as a power source. When weather conditions get bad as they did this week, intermittent renewable energy like wind isn't there when you need it. <https://www.forbes.com/sites/salgilbertie/2021/02/15/texas-outages-put-reliability-of-renewable-energy-in-the-spotlight/>

#2 - Nuclear also got too cold: We only have 4 nuclear units in TX, near Houston and Dallas. One of the reactors near Houston turned off due to a safety sensor freezing. No problem with the reactor. But the lack of the sensor forced the plant to shutdown, as a precaution.

(On another note, this shows how safe nuclear is. Lots of safety precautions.)

#3 - We don't have enough Natural Gas online:

ERCOT planned on 67GW from natural gas/coal, but could only get 43GW of it online. We didn't run out of natural gas, but we lost the ability to get it transported. Pipelines in Texas don't use cold insulation – so they froze.

Every natural gas plant stayed online. The “downed” plants were due to scheduled maintenance.

Gov. Abbott made the right call in diverting all natural gas to home heating fuel and then electricity for homes. Gas and coal brought a stable supply of energy, but still not enough.

Why don't we have extra gas power when we need it most?

Because years of federal subsidies for wind has caused an over reliance on wind and an under-investment in new gas and nuclear plants.

Bottom line: fossil fuels are the only thing that saved us. They are \*base load\* energy.

If we were even \*more\* reliant on the wind turbines that froze, the outages would have been much worse.

This raises the obvious question: can we ever rely on renewables to power the grid during extreme weather?

No, you need gas or nuclear.

And subsidizing investment in wind has pushed gas and nuclear out.

Now we live with the consequences.

The push to decommission baseload power sources like natural gas would be disastrous when trying to keep the lights on in Texas.

I'll be joining my Texas colleagues in getting to the bottom of what happened. We can do better, even for once in a century events.

In the meantime, stay warm, stay safe, and stay strong.

**From:** [Smith, Elizabeth](#)  
**To:** [Tim](#)  
**Subject:** RE: Courtland-Hillsboro proposed solar plant  
**Date:** Wednesday, February 24, 2021 8:16:00 AM  
**Attachments:** [image001.png](#)

---

Mr. Guyse,

Thank you for your comment on the North Alabama Utility-Scale Solar Facility Draft Environmental Impact Statement (EIS). Once the public comment period closes, TVA will analyze comments, conduct further research if a comment necessitates that, and prepare the final EIS.

The project webpage will be updated with the final EIS and Record of Decision.

Thanks,  
Elizabeth

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**Elizabeth R. Smith**  
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---

**From:** Tim [REDACTED]  
**Sent:** Tuesday, February 23, 2021 10:04 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Re: Courtland-Hillsboro proposed solar plant

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Thanks again Elizabeth. I heard an informative interview with Jason Isaac, an expert on the Texas power grid who explained the central issues that caused their recent blackouts. He confirmed information from other reports I had read regarding the problems with renewables or as he calls them, unreliable

sources. His argument is very convincing that, for decades, Texas has been decreasing support for reliable sources and has been increasing funding for unreliable sources.

Another source I read recently detailed the science behind the battery resources required to store energy from renewables. The report pointed out that it is scientifically impossible to create enough battery capacity to support renewables at the level that many government targets specify.

I believe the support for individuals pursuing solar panels for their homes or business is a commendable pursuit. However, for the government and utilities to take limited investment funds away from reliable sources in order to waste funds on unreliable sources is very bad policy. Increased reliance on unreliable sources such as solar and wind will result in an increase in the type of grid failures we have seen in California and now Texas. I urge TVA to not only abandon the construction of the Courtland-Hillsboro solar plant but to discontinue pursuit of all unreliable energy projects and focus those limited investment funds on sources to strengthen our grid.

Sincerely,

Tim Guyse

On Friday, February 12, 2021, 09:01:35 AM CST, Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)> wrote:

Yes, a recording of the virtual meeting will be available on Tuesday, February 16, 2021 on the project webpage:

<https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/north-alabama-utility-scale-solar-project>

Thanks,  
Elizabeth

Get [Outlook for iOS](#)

---

**From:** Tim [REDACTED]  
**Sent:** Thursday, February 11, 2021 9:55:23 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Re: Courtland-Hillsboro proposed solar plant

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Thanks Elizabeth but I ended up with conflicting meetings tonight. was the session recorded?

Thank you.  
Tim

On Wednesday, February 10, 2021, 07:12:15 AM CST, Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)> wrote:

Tim,

Thank you for your comment in regards to the North Alabama Utility-Scale Solar Facility.

TVA is conducting a virtual public information meeting on Thursday, February 11, 2021, beginning at 7:00pm CST. We'll be discussing the site selection process, as well as providing cultural information. If you'd like to join, please register through the project webpage:

<https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/north-alabama-utility-scale-solar-project>

Thanks,

Elizabeth

**Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.**

**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**

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---

**From:** Tim [REDACTED]  
**Sent:** Tuesday, February 9, 2021 11:07 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** Courtland-Hillsboro proposed solar plant

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I oppose the building of the solar power mega-site in our community. The Wheeler community will cease to exist if this monstrosity is built here. Besides, solar power in its current state is not a financially feasible power source and constitutes a massive boondoggle on TVA's part. Stick to hydro, coal, and especially nuclear. A solar plant of this size has a limited lifespan and the waste involved at the end of that life will be a burden on TVA and the community. The money wasted on this project could be much better spent toward nuclear energy and would not ruin 3000 prime acres along a major thoroughfare in North Alabama. The drive from Decatur to the Shoals will never be the same if this goes forward. If TVA must bow to the gods of climate change then let them do it in a location that is less populated and off the beaten path.

I know the archaeological study has been performed because I know some of the scientists who work for the firm who performed the study and I observed the work as it was performed last year. I am not yet privy to the results but I know from personal experience that there are numerous archaeological resources that will be destroyed by such as massive project. As an avocational archaeologist myself and an officer in the Rebel State Archaeological society, as well as someone who grew up in Courtland, I am very familiar with the diversity of archaeological sites spread across the property being considered. Relics going back the Paleo period, 10,000+ years ago all the way through the Civil War period are found on this Wheeler property. Multiple Confederate armies marched through and spent time in Wheeler during the war. And as a Native American myself (1/12th) I have recovered many artifacts from the sites around Wheeler/Sunnybrook, with permission. There is also a house of historical significance in the middle of the proposed site here in Sunnybrook not to mention Pond Springs, home of General Joe Wheeler.

I urge TVA to not pursue this project in our community.

Respectfully,

Tim Guyse

[REDACTED]

[REDACTED]




400 West Summit Hill Drive, Knoxville, Tennessee 37902

March 4, 2021

Ms. Meg Frisbie  
Cultural Resources Specialist  
National Trails  
National Park Service  
Post Office Box 728  
Santa Fe, New Mexico 87504

Dear Ms. Frisbie:

RE: NORTH ALABAMA UTILITY-SCALE SOLAR FACILITY DRAFT EIS, LAWRENCE COUNTY, ALABAMA (TVA TRACKING NUMBER – CID CID 78110)

By this letter, TVA is responding to your February 2, 2020 email regarding the discussion of the segment of the former Tuscumbia, Courtland, and Decatur (TC&D) Railroad (1832-1851) and the proposed undertaking's effects to property 1LA0001 (present-day Norfolk Southern Railroad). Located immediately south of, and running parallel to, U.S. Highway 72 (AL-20), property LA00001 consists of a 2.91-mile segment of railroad traversing (east-west) the project area (Figure 1). Actively operated by the Norfolk Southern Railroad, property LA00001 is associated with the right-of-ways of three former railroads, including the TC&D Railroad, the Memphis and Charleston Railroad (M&C [1851-1894]), and the Southern Railway (SOU [1894-1982]). This resource is located within the architectural survey area for TVA's proposed North Alabama Utility-Scale Solar Facility. The architectural survey report titled, *A Phase I Architectural Survey Associated with the Planned North Alabama Utility Scale Solar Project in Lawrence County, Alabama* that specifically discusses the Railroad can be downloaded at 

TVA determined in consultation that property LA00001 was eligible for the National Register of Historic Places (NRHP) under Criterion A for its historical significance in the areas of ethnic heritage, military, and economics/transportation, with a period of significance of 1832-1930. In connection with the Indian Removal Act of 1830, this segment of the TC&D Railroad was used to transport three detachments of Indian tribes to territories in the West; specifically, the routes of the Smith (March 9-10, 1837), Deas (July 11, 1838), and Whiteley (July 21, 1838). The detachments used the railroad to transport Cherokee from Decatur to Tuscumbia Landing. During the Civil War, LA00001 was used by both Confederate and Union armies as a major artery to move troops and supplies throughout the region and was the source of numerous skirmishes throughout northern Alabama during the war. Lastly, the railroad corridor served as an important catalyst in the economic development of the Tennessee Valley during its period of significance (ca. 1832-1930), including the formation of the community of Wheeler Station which thrived during the late 1800s and early 1900s. TVA also recommended property LA00001 eligible for the NRHP under Criterion C for its association with a unique engineering

achievement in railroad construction; specifically, the creation of a rail route designed to circumvent the hazardous shoals that characterized the Tennessee River between Decatur and Tuscumbia. The assessment of the segment of the TC&D Railroad associated with the Trail of Tears is largely restricted to the architectural survey area (the scope of TVA's compliance with Section 106 of the National Historic Preservation Act). It should be noted, however, that the TC&D Railroad/Trail of Tears relationship from Decatur to Tuscumbia Landing has been examined in three studies (King et al. 2009; King et al. 2012; and MTSU 2018). Information contained in these three reports was used in the production of the Phase I architectural survey report.

TVA consulted with the Absentee Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Cherokee Nation, The Chickasaw Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Jena Band of Choctaw Indians, Kialegee Tribal Town, The Muscogee (Creek) Nation, Poarch Band of Creek Indians, The Seminole Nation of Oklahoma, Shawnee Tribe, Thlopthlocco Tribal Town, and United Keetoowah Band of Cherokee Indians in Oklahoma, all of whom have expressed an interest in the area, regarding the study. TVA received no concerns from federally recognized Indian tribes regarding the undertaking. TVA also consulted with the Alabama State Historic Preservation Officer (AL SHPO). The AL SHPO agreed with TVA's finding that property LA00001 is NRHP-eligible. However, the AL SHPO also requested additional documentation regarding the association of late nineteenth to mid-twentieth century archaeological sites with the postbellum tenant system associated with the former plantations at Pond Spring and Bride's Hill and the town of Wheeler Station. They also requested additional information regarding the undertaking's potential effects to the landscape, including the landscape of two NRHP-listed properties, Bride's Hill and Pond Springs (Wheeler Plantation).

TVA has contracted with the Tennessee Valley Archaeological Research (TVAR) to conduct additional archival documentation to examine the potential for a historic rural district within the area of potential effects (APE). TVA also contracted with HDR to produce three-dimension modeling and photo simulation renderings of the line-of-sight views from property LA00001, Bride's Hill, and Pond Springs.

TVAR's work is still ongoing, but I would like to provide you the information they have identified that ties directly to your question regarding the effects to the landscape of property LA00001. Property LA00001's period of significance reflects its creation as the first railroad in Alabama (and one of the earliest located west of the Appalachians), its use during Indian Removal, its role in the Civil War and the Reconstruction periods, as well as its continued significance in commerce and transportation through the boom years of cotton. Based on additional research, TVAR recommends that portions of the project area be considered a historic district (Wheeler Station Rural Historic District (WSRHD)) with a period of significance of 1818-1955. It is the opinion of TVAR that property LA00001 as contributing resource to this potential NRHP district. Three extant historic properties likely dating to the period of 1837-1838 are located within the architectural survey area: Pond Springs Plantation, Bride's Hill, and Byrd Log House. Pond Spring Planation (079-58) and Bride's Hill (079-502) are NRHP-listed properties, and Bride's Hill and the Byrd Log House (079-60) are Alabama Register of Landmarks and History (ARLH)-

Ms. Meg Frisbie  
Page 3  
March 4, 2021

listed properties (Figure 1). All three properties are associated with the initial development of the plantation landscape in Lawrence County between 1820 and 1840. Within the APE, there are areas of open agricultural fields and tree lines along property boundaries located within the reconstructed property boundaries of the Pond Spring Plantation, as well as the overall potential WSRHD, that appear to retain vestiges of the plantation landscape that first developed between 1820 and 1840 and continued into the 1950s (Figure 2).

TVA designed the placement of the solar array in order to minimize viewshed effects to the historic properties identified during the Phase I survey. As a result, the ArcGIS architectural viewshed model conducted by TVAR based on the current proposed solar array placement indicates that the panels would only be visible on the easternmost part of the project area (Figure 3). As stated above, there are vestiges of the landscape within the entire project APE that have remained unaltered during the period of significance of the railroad. However, there are also large portions of this landscape that have been altered due to various above-ground intrusions constructed outside the period of significance by modern development and/or land-use activities (including extensive clear-cutting in some locations). This has resulted in a fragmented historic landscape in terms of both setting (physical environment) and feeling (expression of the aesthetic or historic sense of a particular period). In terms of the setting of property LA0001, in the areas that will be visible from the project area the setting has been compromised by the creation and expansion of U.S. Highway 72, a transmission line corridor, and several modern buildings (Figures 4-7). In the area in the southeast where the project would be visible the setting has already been compromised by the Glen Allen Railroad, Inc. distribution center (Figure 7). Figure 8 depicts the results of photo-simulation of the proposed solar array in the northeastern portion of the site that will be visible based on the viewshed modeling. Given the small portion of the resource that will be visible to the solar arrays, the obstruction of US Highway 72, the establishment of a land buffer (ca. 160-180 m), and the low profile of the solar array, TVA maintains that although there will be a visual effect, the effect is minimal. Furthermore, the proposed undertaking will not be physically located within the property's proposed NRHP boundary nor will it result in alteration of the railroad alignment or diminish its ability to convey its significance under Criterion A or C.

Please contact Michaelyn Harle by email, [mharle@tva.gov](mailto:mharle@tva.gov), with your comments.

Sincerely,



Clinton E. Jones  
Manager  
Cultural Compliance

MSH:ABM  
Enclosures

## References Cited

King, Marty, Lamar Marshall, and Larry Smith

2009 *North Alabama's Tuscumbia, Courtland, and Decatur Railroad and Its Role During Cherokee Emigration/Removal Beginning in 1837.*

King, Gail, Hunter B. Johnson, and Ann Marshall

2012 *Historic Document Research, Geophysical Survey, Mapping, and Archaeological Inventory at Tuscumbia Landing, a Trail of Tears National Historic Trail Site in Colbert County, Alabama.*

Middle Tennessee State University Center for Historic Preservation

2018 *Courtland-Leighton Cultural Landscape Inventory & Assessment.*



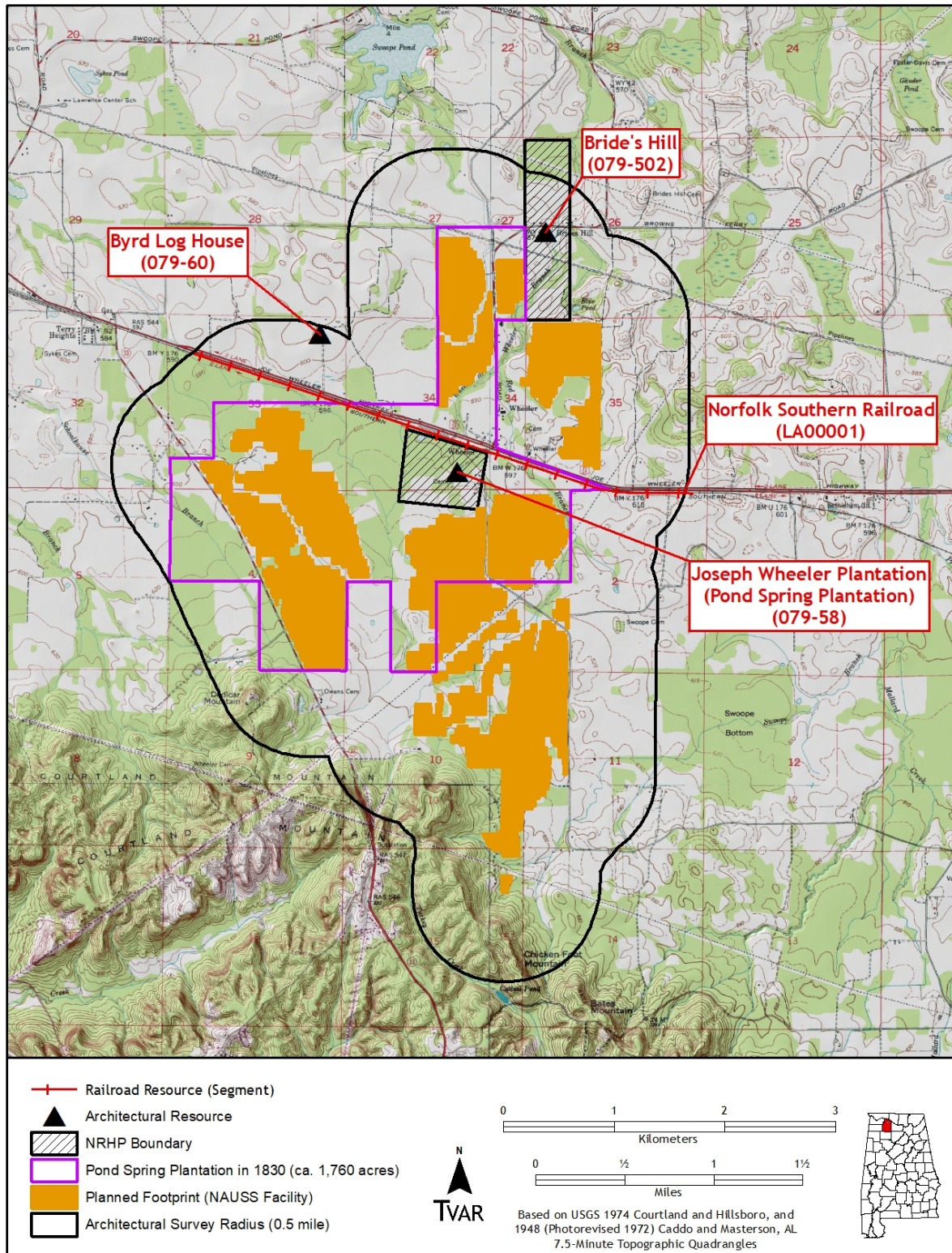


Figure 1. Topographic map illustrating the locations of historic properties documented within the architectural survey area and the planned footprint of the facility.



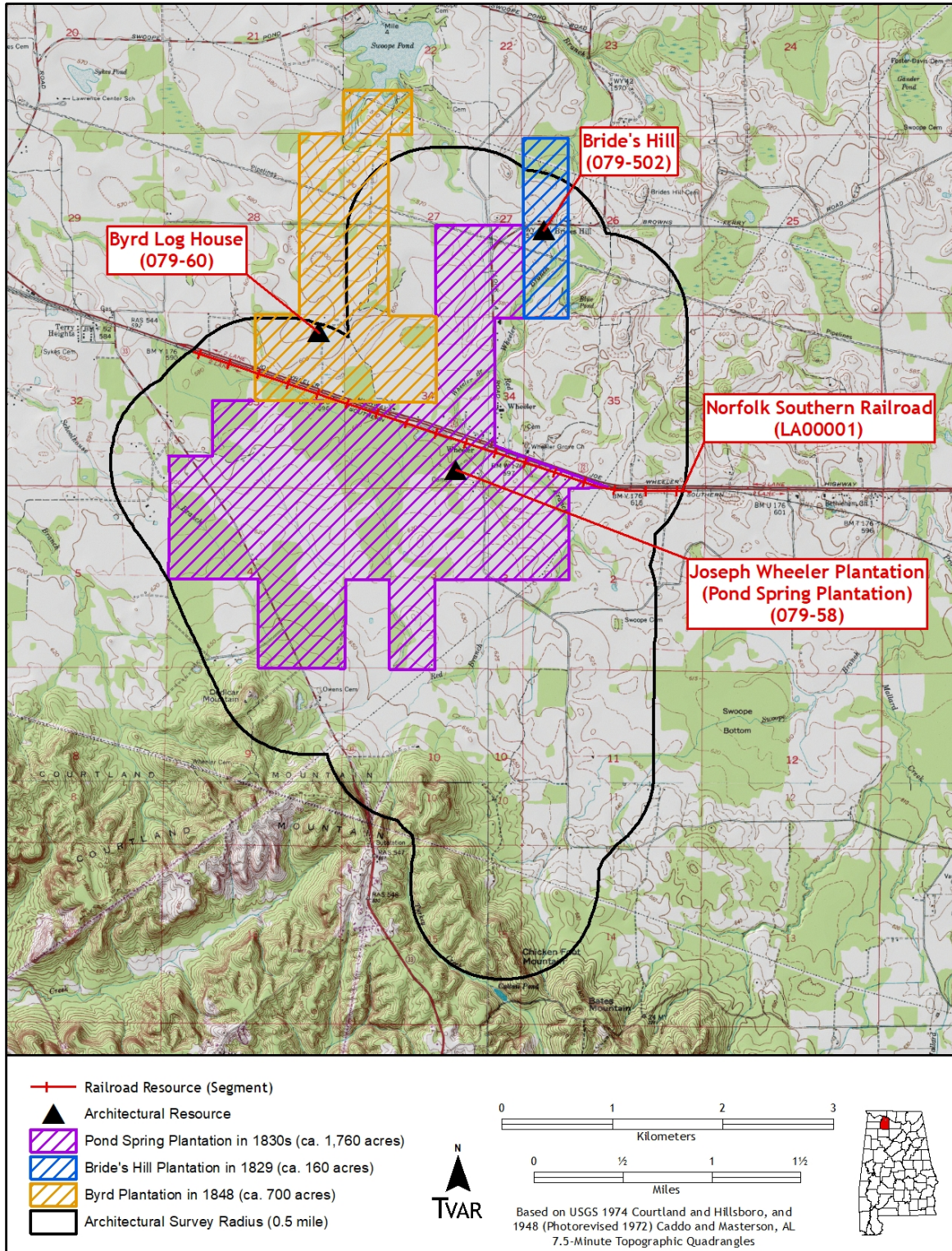


Figure 2. Topographic map illustrating the reconstructed boundaries of the Pond Spring Plantation (1830s), Bride's Hill Plantation (1829), and Byrd Plantation (1848 [possibly dates to 1830s]) based on TVAR's additional archival research.



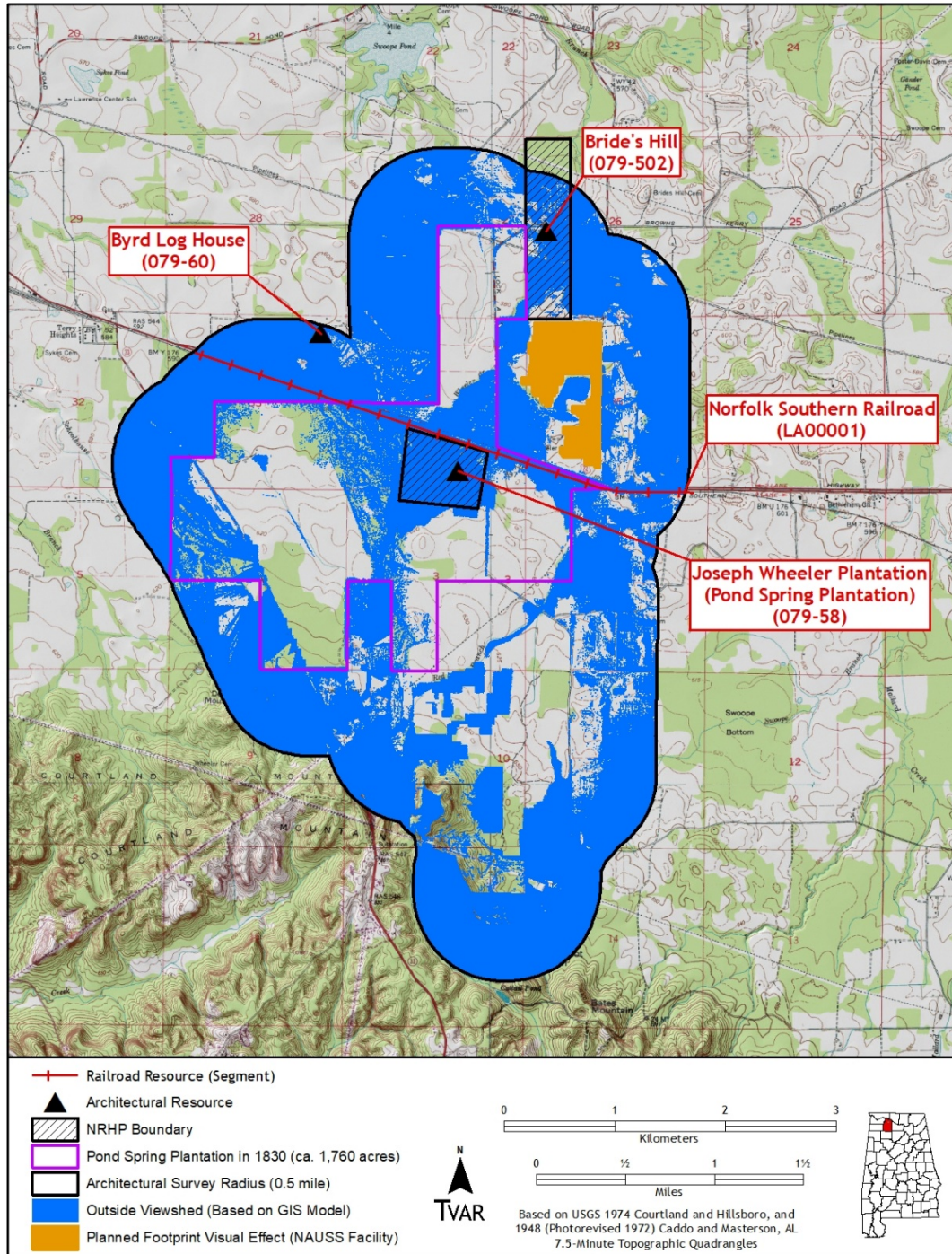


Figure 3. Topographic map illustrating the locations of historic properties documented by TVAR located within the architectural survey area in relation to the viewshed model, the planned footprint of the facility that will visually affect Property LA00001, and the reconstructed boundary of the Pond Spring Plantation tract.



Figure 4. Property LA00001 at-grade crossing fronting the Joseph Wheeler Plantation property (view to the west).



Figure 5 View of the Property LA00001 and Wheeler Depot ca. 1930s (view to the west). Compare 1930s setting with present-day setting illustrated in Figure 4.



Figure 6. Property LA00001 at-grade crossing fronting the Joseph Wheeler Plantation property (view to the northeast). Note the presence of Property LA00007 (ca. 1965 commercial building) located on the north side of U.S. Highway 72. Wheeler Grove Baptist Church (Property 079-493; ca. 1930s) is also visible to the right.





Figure 7. View toward Norfolk Southern Railroad from the perspective of the gravel drive leading to the parking area in front of the Joe Wheeler House. Note the modern commercial building (constructed in 1982) associated with the Glen Allen Railroad, Inc. distribution center (view northeast).



Figure 8: Photo simulation of the solar array taken from the southeast depicting the line of sight from LA00001 to the project area



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Harriet – see NPS response below.

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**Should you need to speak with me directly, my mobile phone # is listed below.**

**Elizabeth R. Smith**  
NEPA Specialist

NEPA Programs  
Tennessee Valley Authority  
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Knoxville, TN 37902

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865-250-9138 (m)  
[esmith14@tva.gov](mailto:esmith14@tva.gov)



**From:** Frisbie, Margaret X <Margaret\_Frisbie@nps.gov>  
**Sent:** Friday, March 5, 2021 5:16 PM  
**To:** Harle, Michaelyn S <mharle@tva.gov>  
**Cc:** Smith, Elizabeth <esmith14@tva.gov>; Jones, Clinton E <cjones5@tva.gov>; McCampbell, Amy Boardman <aboardma@tva.gov>  
**Subject:** Re: [EXTERNAL] RE: North Alabama Utility-Scale Solar Facility Draft EIS

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Hi Michaelyn,

Thank you very much for providing this additional information regarding potential effects to the landscape--particularly the Trails of Tears National Historic Trail designated alignment/former Tuscumbia, Courtland, and Decatur Railroad (LA0001)--and for providing a link to the Phase I architectural survey. I appreciate that the solar array placement was designed to minimize viewshed effects to the historic properties, which is well demonstrated in the GIS model depicting viewsheds. The photo simulation (Figure 8) of line-of-sight view from the Trail of Tears designated alignment towards the solar array where it will be visible is very useful.

I agree that since the solar array will only be visible from one portion of the railroad, modern development is present, the land buffer, and the horizontal profile of the arrays, that the effect on the viewshed and setting will not be significant. I submitted comments via our internal

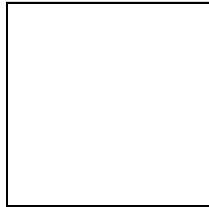
Environmental Review Tracking system, noting I do not anticipate any significant impacts to the trail alignment.

I truly appreciate your thorough response to the inquiry.

Best wishes and have a great weekend,

Meg

Meg Frisbie  
Cultural Resources Specialist  
National Trails  
National Park Service  
1100 Old Santa Fe Trail  
Santa Fe, NM 87505  
505.470.0426 cell  
[margaret\\_frisbie@nps.gov](mailto:margaret_frisbie@nps.gov)



---

**From:** Harle, Michaelyn S <mharle@tva.gov>  
**Sent:** Thursday, March 4, 2021 2:32 PM  
**To:** Frisbie, Margaret X <Margaret\_Frisbie@nps.gov>  
**Cc:** Smith, Elizabeth <esmith14@tva.gov>; Jones, Clinton E <cjones5@tva.gov>; McCampbell, Amy Boardman <aboardma@tva.gov>  
**Subject:** RE: [EXTERNAL] RE: North Alabama Utility-Scale Solar Facility Draft EIS

Meg,  
Please find our response attached and please feel free to reach out if you would like to discuss.  
Thanks,  
Michaelyn

**Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.**

**My mobile phone is listed below and you can call or txt until further notice.**

**Michaelyn Harle, Ph.D**  
Archaeologist  
Cultural Compliance

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**Sent:** Friday, February 12, 2021 2:23 PM  
**To:** Harle, Michaelyn S <mharle@tva.gov>  
**Cc:** Smith, Elizabeth <esmith14@tva.gov>  
**Subject:** Re: [EXTERNAL] RE: North Alabama Utility-Scale Solar Facility Draft EIS

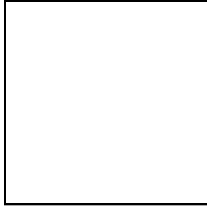
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Hi Michaelyn,

Wonderful, thanks so much for your message!

Much appreciated,  
Meg

Meg Frisbie  
Cultural Resources Specialist  
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National Park Service  
P.O. Box 728  
Santa Fe, NM 87504  
505.470.0426 cell  
[margaret\\_frisbie@nps.gov](mailto:margaret_frisbie@nps.gov)



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**From:** Harle, Michaelyn S <[mharle@tva.gov](mailto:mharle@tva.gov)>  
**Sent:** Friday, February 12, 2021 5:53 AM  
**To:** Frisbie, Margaret X <[Margaret\\_Frisbie@nps.gov](mailto:Margaret_Frisbie@nps.gov)>  
**Cc:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** [EXTERNAL] RE: North Alabama Utility-Scale Solar Facility Draft EIS

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Margaret,

I just wanted to let you know that I promise I have not forgotten about your inquiry regarding the Tuscumbia, Courtland, and Decatur Railroad. The AL SHPO asked for additional information regarding the larger landscape beyond what was provided in our phase I report. We are currently working on that now. Their concern mostly pertains to the Wheeler Plantation (Pond Springs) and Bride's Hill Plantation that are in the study area, but some of this information will be helpful in addressing your concerns. We are working on pulling this information together and will have a formal response to you soon.

Thanks,  
Michaelyn

**Due to COVID-19 safety precautions enacted by TVA, I am currently teleworking.**

**My mobile phone is listed below and you can call or txt until further notice.**

**Michaelyn Harle, Ph.D**  
Archaeologist  
Cultural Compliance

400 W. Summit Hill Drive  
WT 11A-K  
Knoxville, TN 37902

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**From:** Frisbie, Margaret X <[Margaret\\_Frisbie@nps.gov](mailto:Margaret_Frisbie@nps.gov)>  
**Sent:** Tuesday, February 2, 2021 5:00 PM  
**To:** Smith, Elizabeth <[esmith14@tva.gov](mailto:esmith14@tva.gov)>  
**Subject:** North Alabama Utility-Scale Solar Facility Draft EIS

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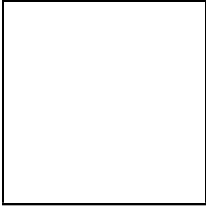
Good afternoon Elizabeth,

I hope this email finds you well. My name is Meg Frisbie and I’m a cultural resources specialist with the National Park Service National Trails office. I received a copy of the North Alabama Utility-Scale Solar Facility Draft EIS for review and wanted to touch base with you briefly. The DEIS notes that the segment of the former Tuscumbia, Courtland, and Decatur Railroad associated with the Trail of Tears is eligible for listing in the NRHP under Criterion A. The report notes that there will be visual impacts to the National Historic Trail (NHT), but since the setting of the property has been compromised, there will be no adverse effect to the historic resource. Is there any additional information on the boundaries of this eligible segment? Since the setting will change from what is now largely agricultural, rural-residential with some modern development, and forested lands, to a large solar array, I'm curious if impacts to the setting and feeling of the trail were considered. Do any of the other architectural features from the Joseph Wheeler Plantation - or other nearby historic resources - date to a similar period as the Trail of Tears? I’m curious if any of the features of the plantation were present during the historic period of the late 1830s. Would there be restoration buffers between the trail alignment and the solar array that may create a visual buffer?

Thanks so much for your time!

Meg

Meg Frisbie  
Cultural Resources Specialist  
National Trails  
National Park Service  
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March 8, 2021

Ms. Elizabeth Smith,  
NEPA Specialist  
Tennessee Valley Authority  
400 West Summit Hill Drive,  
WT11B Knoxville, Tennessee 37902  
E-Mail: [esmith14@tva.gov](mailto:esmith14@tva.gov)

Comment on: North Alabama Utility-Scale Solar Facility  
Draft Environmental Impact Statement  
Lawrence County, Alabama

Dear Ms. Smith,

As part of the Tennessee Valley Authority's (TVA) Integrated Resource Plan (IRP), the proposed project converts mainly agricultural farmland use to industrial use for construction of a renewable energy utility-scale solar facility, as part of a strategy to meet the demand for electricity in its service territory for the coming 20 years.

Going over the projects' proposed Draft Environmental Impact Statement (DEIS), the impact of the project on groundwater and surface water quality due to potential increase in herbicides use is unclear.

The proposed project area underlies the Tuscumbia-Fort Payne aquifer, which is the most widely used aquifer for public water supply in the area. Section **3.4.1.2.1 No Action Alternative (page 44)** mentions that "...If the local aquifers were recharged from surface water runoff, the use of chemical fertilizers and pesticides could impact the quality of the groundwater." According to section **2.2.4 Solar Facility Operations (page 17)** the use of herbicides is mentioned as one of the methods used to manage vegetation growth within the developed portions of the Project Site.

The proposed alternative does not address the ways in which the aquifer is replenished and whether permeable surface water is a significant source of its recharging. A better understanding of the areas' hydrology, will provide an indication to the extent of the effect that increase use of herbicide application within the Project site will have on groundwater quality.

Also, increase in land cover due to solar panels coverage may increase surface water runoffs from the Project Site to the adjacent Streams. What kind of mitigation practices will be taken to make sure that there would not be noticeable increase in herbicides in both groundwater and any other bodies of water (such as streams and creeks)?

Sincerely,  
Galia Peleg  
Environmental Systems and Human Health MPH student, Oregon Health and Science University





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

March 15, 2021

Elizabeth Smith  
NEPA Specialist  
Tennessee Valley Authority  
400 West Summit Hill Drive, WT11B  
Knoxville, Tennessee 37902

Re: EPA Comments on the Draft Environmental Impact Statement (DEIS) for the Tennessee Valley Authority North Alabama Utility-Scale Solar Facility; CEQ Number: 20210011

Dear Ms. Smith:

The United States Environmental Protection Agency (EPA) has reviewed the referenced document in accordance with Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The purpose of the DEIS is to examine the potential environmental effects associated with constructing, operating, maintaining, and decommissioning a solar Photovoltaic (PV) facility. Tennessee Valley Authority (TVA) plans to purchase a 2,896-acre property located in Lawrence County, Alabama to expand its solar generating capacity.

The DEIS examines the No Action Alternative and the Proposed Action Alternative. Under the No Action Alternative, TVA would not execute the purchase of the property using a Purchase Option Agreement and would not develop a solar PV facility. Maintenance of the existing transmission lines would continue to occur in the absence of the project. With the Proposed Action Alternative, TVA would construct a 200-megawatt (MW) alternating current (AC) solar PV facility, including an electrical substation and possibly a battery energy storage system, on a 1,459-acre portion of the Project Site. An additional 150 acres of the Project Site would be maintained as species-rich native plant meadow. The proposed project would connect to the existing adjacent Wilson Hydroelectric Plant (HP)– Mountain Home 161-kilovolt (kV) transmission line (TL) and require upgrades on this TL and the Mountain Home–Trinity 161-kV TL, extending into Morgan County, Alabama.

The DEIS indicates that the Project Site will be developed with the intent of entering into a power purchase agreement (PPA) between TVA and a qualified company to own, maintain, and operate the facility for up to a 20-year period. At the end of the PPA term, TVA would repurchase the property and allow the PPA to expire and decommission the facility or, as evaluated under separate environmental review, enter into a new PPA or choose to operate the solar PV facility for an additional period.

The EPA understands that TVA's preferred alternative is the Proposed Action Alternative. The EPA has not identified any significant environmental impacts to the proposed action that would require substantive changes to the DEIS or require the TVA's consideration of alternative locations for the

proposed solar PV facility. The EPA has enclosed detailed comments for your consideration (see enclosure).

The EPA appreciates the opportunity to review the TVA's North Alabama Utility-Scale Solar Facility DEIS. If you have any questions, please contact Ms. Amanetta Somerville, of the NEPA Section at 404-562-9025 and via email at [somerville.amanetta@epa.gov](mailto:somerville.amanetta@epa.gov) or Mr. Larry Gissentanna, NEPA Project Manager at 404-562-8248 and via email at [gissentanna.larry@epa.gov](mailto:gissentanna.larry@epa.gov).

Sincerely,

*Ntale Kajumba* for

Mark J. Fite  
Director  
Strategic Programs Office

Enclosure

## Enclosure

### **EPA comments on the Draft Environmental Impact Statement for the Tennessee Valley Authority North Alabama Utility-Scale Solar Facility; Lawrence County, Alabama. CEQ Number: 20210011**

**Background:** According to the DEIS, the preferred project alternative will require the clearing of 320 acres of forest. However, less than 10 acres of the forest is mature with well-developed canopy and an understory populated with mostly native plants. Additionally, 920 acres of forested land on the project site will not be cleared for the solar PV facility.

EPA notes that as a minimization effort and to promote environmental stewardship and pollinator habitat, TVA would also manage up to 150 acres of the Project Site as species-rich meadow. These restoration zones would be situated in areas that currently support croplands or in areas that were timbered in the past. In these areas, restoration sites would be seeded with up to 35 species of native grasses and wildflowers.

**Endangered Species:** Section 3.5.4 of the DEIS indicates that there is potentially suitable roosting habitat for endangered bat species within the project area, and all tree clearing would be limited to those times of the year when bats are not expected to be roosting in the area (from November 15 thru March 15). Due to the loss of potentially suitable foraging and roosting habitat for endangered bat species, Section 7 consultation with the U.S. Fish and Wildlife (FWS) will be required.

Recommendation: The EPA principally defers to the FWS regarding matters pertaining to compliance with the Endangered Species Act. The EPA recommends that any additional conservation measures identified by the FWS during consultation be included in the final EIS and/or record of decision.

**Wetlands:** Section 3.4.2 of the DEIS identified 125.41 wetland acres on the Project Site. The proposed solar PV array and associated infrastructure would only impact 0.07 acres of these delineated wetlands.

Recommendation: The EPA notes that the 0.07 acres of wetland impact are subject to regulatory oversight of the US Army Corps of Engineers, Nashville District, and the Alabama Department of Environmental Management. The EPA recommends any contractor working on-site use best management practices and address any potential impacts to off-site streams and waterways. The EPA also recommends that site grading, excavation, and construction plans should include implementable measures to prevent erosion and sediment runoff from the project site during and after construction.

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## **Appendix C – TVA Transmission Best Management Practices**

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## **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 Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017).

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 Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017). 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.

## References

Tennessee Valley Authority. 2017. A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities, Revision 3. Edited by G. Behel, S. Benefield, R. Brannon, C. Buttram, G. Dalton, C. Ellis, C. Henley, T. Korth, T. Giles, A. Masters, J. Melton, R. Smith, J. Turk, T. White, R. Wilson. Chattanooga, TN.: Retrieved from

<<https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects>>  
(n.d.).

Revision July 2017

## **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 Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017).

### **Three Levels of Protection**

During the preconstruction review of a proposed transmission line, the TVA Environmental Biological Compliance staff will have studied each possible stream impact site and will have identified it as falling into one of three categories: (A) standard streamside management protection, (B) protection of important permanent streams, springs, and sinkholes, 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 federal requirements to avoid harming certain species.

As early as possible after field surveys are completed by the TVA Biological Compliance Staff, any streams that have been designated as either Category B or C will be discussed with the TVA Environmental Transmission staff. The purpose of these discussions will be to minimize the number of crossings and their impact on the important resources in the streams during design and construction. The category designation for each stream site will then be marked on the transmission line 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, springs, sinkholes, 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, springs, and sinkholes will be done using pertinent best management practices (BMPs) such as those described in *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities*, especially Chapter 5, "Structural Controls Standards and Specifications" (TVA, 2017).

2. All equipment crossings of streams and shorelines 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 as a result of clearing operations by the actions of plowing, disking, blading, or other tillage or grading equipment will be minimized in SMZs. Shorelines that have to be disturbed must be stabilized as soon as feasible.

#### **(B) Protection of Important Permanent Streams, Springs, and Sinkholes**

This category will be used when there is one or more specific reason(s) why a permanent (always-flowing) stream, spring, or sinkhole requires protection beyond that provided by standard BMPs. Reasons for requiring this additional protection include high potential for occupancy by federally listed or significant state-listed species, federally designated critical habitat, or areas designated as special use classification (e.g., trout waters). 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 Tennessee Valley Authority Construction and Maintenance Activities*, especially Chapter 5, "Structural Controls Standards and Specifications" (TVA, 2017).
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. Category B designations will be discussed with the TVA Environmental Transmission staff as early as possible in the process, to allow time to discuss possible avoidance or minimization of impacts with design and construction.
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



Electrical 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 be minimized in SMZs. 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 requiring special protection is present (for example, the spawning area of a rare species), the stream is known to be occupied by a federally listed or significant state-listed species, or when required as a special condition resulting from consultation with the United States Fish and Wildlife Service to avoid project effects on a listed species or designated critical habitat. 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 Tennessee Valley Authority Construction and Maintenance Activities*, especially Chapter 5, "Structural Controls Standards and Specifications" (TVA, 2017).
2. Category C designations would be discussed with the TVA Environmental Transmission staff as early as possible following field surveys to allow time to discuss possible avoidance or minimization of impacts with design and construction. Environmental Energy Delivery staff would discuss construction activities to take place in the SMZ with the Environmental Biological Compliance staff. On-site planning sessions would be conducted as needed. All crossings of streams also must comply with appropriate state (and, at times, federal) permitting requirements.
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 should be limited to those required to meet National Electrical Safety Code, Federal Energy Regulatory Commission standards, and danger tree requirements. Stumps can be cut close to ground level, but must not be removed or uprooted.
4. Other vegetation near the unique habitat must be disturbed as little as possible during construction. Soil disturbance by plowing, disking, blading, or grading must be kept at a minimum. Areas that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible.

5. Special SMZ requirements will be coordinated with Environmental Biological Compliance staff.

## **Maintenance**

During ongoing operations, SMZs will be inspected frequently; and during inactive periods, occasionally. Damaging or failing situations that may cause unacceptable water quality impacts will be corrected as soon as practical.

## **References**

Tennessee Valley Authority. 2017. A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities, Revision 3. Edited by G. Behel, S. Benefield, R. Brannon, C. Buttram, G. Dalton, C. Ellis, C. Henley, T. Korth, T. Giles, A. Masters, J. Melton, R. Smith, J. Turk, T. White, R. Wilson. Chattanooga, TN.: Retrieved from <<https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects>> (n.d.).

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## Comparison of Guidelines Under the Three Stream and Water Body Protection Categories<sup>1</sup> (page 1)

Guidelines	A: Standard Stream Protection	B: Protection of Important Permanent Streams, Springs, and Sinkholes	C: Protection of Unique Habitats
1. <b>Reference</b>	<ul style="list-style-type: none"> <li>All TVA construction work around streams, springs, and sinkholes will be done using pertinent Best Management Practices (BMPs) such as those described in <i>A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities</i>, especially Chapter 5, "Structural Controls Standards and Specifications."</li> </ul>	<ul style="list-style-type: none"> <li>Except as modified by Guidelines 2-4, all construction work around streams will be done using pertinent BMPs such as those described in <i>A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities</i>, especially Chapter 5, "Structural Controls Standards and Specifications."</li> </ul>	<ul style="list-style-type: none"> <li>Except as modified by Guidelines 2-4, all construction work around the unique habitat will be done using pertinent BMPs such as those described in <i>A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities</i>, especially Chapter 5, "Structural Controls Standards and Specifications."</li> </ul>
2. <b>Equipment Crossings</b>	<ul style="list-style-type: none"> <li>All equipment crossings of streams and shorelines must comply with appropriate state permitting requirements.</li> <li>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.</li> <li>Crossings of any permanent streams must allow for natural movement of fish and other aquatic life.</li> </ul>	<ul style="list-style-type: none"> <li>All equipment crossings of streams also must comply with appropriate state (and, at times federal) permitting requirements.</li> <li>Crossings of drainage channels and intermittent streams must be done in ways that avoid erosion problems and long-term changes in water flow.</li> <li>All construction activity would be discussed with the TVA Environmental Transmission staff as early as possible in the process to allow time to discuss possible avoidance or minimization of impacts with design and construction.</li> </ul>	<ul style="list-style-type: none"> <li>All crossings of streams also must comply with appropriate state (and, at times federal) permitting requirements.</li> <li>All construction activity would be discussed with the TVA Environmental Transmission staff as early as possible following field surveys to allow time to discuss possible avoidance or minimization of impacts with design and construction.</li> <li>On-site planning sessions would be conducted as needed.</li> </ul>

<sup>1</sup>Source: *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017)

## Comparison of Guidelines Under the Three Stream and Water Body Protection Categories<sup>1</sup> (page 2)

Guidelines	A: Standard	B: Important Permanent Streams	C: Unique Water Habitats
<b>3.</b> <b>Cutting Trees</b>	<ul style="list-style-type: none"> <li>Cutting of trees within streamside management zones (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.</li> <li>Stumps can be cut close to ground level, but must not be removed or uprooted.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Cutting of trees near permanent streams must be limited to those meeting National Electrical Safety Code (NESC) and danger tree requirements.</li> <li>Stumps can be cut close to ground level, but must not be removed or uprooted.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Cutting of trees near permanent streams must be limited to those meeting NESC, Federal Energy Regulatory Commission standards, and danger tree requirements.</li> <li>Stumps can be cut close to ground level, but must not be removed or uprooted.</li> </ul>
<b>4.</b> <b>Other Vegetation</b>	<ul style="list-style-type: none"> <li>Other vegetation near streams must be disturbed as little as possible during construction.</li> <li>Soil displacement as a result of clearing operations by the actions of plowing, disking, blading, or other tillage or grading equipment will be minimized in SMZs.</li> <li>Shorelines that have to be disturbed must be stabilized as soon as feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Other vegetation near streams must be disturbed as little as possible during construction.</li> <li>Soil displacement by the actions of plowing, disking, blading, or other tillage or grading equipment will be minimized in SMZs.</li> <li>Shorelines that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Other vegetation near the unique habitat must be disturbed as little as possible during construction.</li> <li>The soil disturbance by plowing, disking, blading, or grading must be kept at a minimum.</li> <li>Areas that have to be disturbed must be stabilized as soon as possible and revegetated as soon as feasible. Special SMZ requirements will be coordinated with Environmental Biological Compliance staff.</li> </ul>

<sup>1</sup>Source: *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017)

## **Tennessee Valley Authority Environmental Quality Protection Specifications for Transmission Substation or Communications Construction**

1. General – Tennessee Valley Authority (TVA) and/or the assigned contractor and subcontractors shall plan, coordinate, and conduct his or her operations in a manner that protects the quality of the environment and complies with TVA's environmental expectations discussed in the preconstruction meeting (including clearing and grading or reclearing and removal or dismantling). This specification contains provisions that shall be considered in all TVA and contract construction, dismantling, or forensic operations. If the contractor and his or her subcontractors fail 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 site perimeters, structure, foundation, conduit, grounding, fence, drainage ways, etc., appropriate protective measures to prevent erosion or release of contaminants will be taken immediately upon the end of each step in a construction, dismantling, or forensic sequence, and those protective measures will be inspected and maintained throughout the construction and site stabilization and rehabilitation period.
2. Regulations - TVA and/or the assigned contractor and subcontractor(s) 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 and/or subcontractor(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 and subcontractor(s) 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, site, 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 or communication facility. 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 and best management practices (BMPs).

No subsurface ground-disturbing equipment or stump-removal equipment will be used by construction forces except on access roads or at the actual site, 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, access, and site(s) 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 site or around structures 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 anchor, foundation, or its structure.

5. Sanitation - A designated TVA or contractor and/or subcontractor(s) representative shall contract 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 and subcontractor(s) personnel shall be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced by his or her operations and by his or her 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 wastes. Records of the amounts generated shall be provided to the site's or project's designated environmental specialist. Contractor(s) and subcontractor(s) must meet similar provisions on any project contracted by TVA. Final debris, refuse, product, and material removal is the responsibility of the contractor unless special written agreement is made with the ultimate TVA owner of the site.
7. Landscape Preservation - TVA and its contractor(s) and subcontractor(s) shall exercise care to preserve the natural landscape in the entire construction, dismantling, or forensic 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 access and/or 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, endangered species' habitat, water supply watersheds, and public recreational areas such as parks and monuments. Contractors, their subcontractor(s), 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, grading, borrow, fill, construction, dismantling, or forensic operations, the operations shall immediately cease for at least 100 feet in each direction, and TVA's construction superintendent, project manager, or area environmental program administrator and TVA 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, dismantling, or forensic 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 erected erosion and/or sedimentation control shall be maintained and (when TVA or contract construction personnel are unable) the construction crew(s) shall maintain 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 and at sequential steps of construction at the same location on site. BMPs will be inspected by the TVA field engineer or other designated TVA or contractor and/or subcontractor(s) personnel routinely and during periods of high runoff, and any necessary repairs will be made as soon as practicable. BMP inspections and any required sampling will be conducted in accordance with permit requirements. Records of all inspections and sampling results will be maintained on site, and copies of inspection forms and sampling results will be forwarded to the TVA project manager or supporting environmental specialist.

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

10. Turbidity and Blocking of Streams - Construction, dismantling, or forensic activities in or near streamside management zones 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, dismantling, or forensic 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 Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017).

On rights-of-way, mechanized equipment shall not be operated in flowing or standing water bodies 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, their adjacent wetlands, 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.

Mechanized equipment shall not be operated in flowing or standing water on substation, switching station, or telecommunication sites.

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

11. Floodplain Evaluation - During the planning and design phase of the substation or communications facility, floodplain information should be obtained to avoid locating flood-damageable facilities in the 100-year floodplain. If the preferred site is located within a floodplain area, alternative sites must be evaluated and documentation prepared to support a determination of "no practicable alternative" to siting in the floodplain. In addition, steps taken to minimize adverse floodplain impacts should also be documented.
12. Clearing - No construction, dismantling, or forensic activities may clear additional site or right-of-way vegetation or disturb remaining retained vegetation, stumps, or regrowth at locations other than the structure, substation, or communication site or access thereto. TVA and the construction, dismantling, or forensic contractor(s) must provide appropriate erosion or sediment controls for areas they have disturbed after each disturbance 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.
13. Restoration of Site - All construction, dismantling, or forensic-related 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 Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017). Exceptions would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor.

- D. Rehabilitation species shall use species designated by federal guidance that are low-maintenance, native species appropriate for the site conditions that prevail at that location.
  - E. 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.
  - F. The site must be protected from species designated by the federal Invasive Species Council and must not be the source of species that can be transported to other locations via equipment contaminated with viable materials; thus, the equipment must be inspected, and any such species' material found must be removed and destroyed prior to transport to another location.
14. Air Quality Control - Construction, dismantling, and/or forensic crews shall take appropriate actions to minimize the amount of air pollution created by their operations. All operations must be conducted in a manner that avoids creating a nuisance and prevents damage to lands, crops, dwellings, or persons.
15. Burning - Before conducting any open burning operations, the contractor and subcontractor(s) 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 on rights-of-way or project manager for TVA sites.
16. RENOVAION OR DEMOLITION DEBRIS MAY NOT BE BURNED.
17. Dust and Mud Control - Construction, dismantling, or forensic 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.
18. Vehicle Exhaust Emissions - TVA and/or the contractor(s) and subcontractor(s) 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.
19. Vehicle Servicing - Routine maintenance of personal vehicles will not be performed on the right-of-way or access route to the site. 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 site except adjacent to or in designated sensitive areas. The Heavy Equipment Department within TVA or the construction, dismantling, or forensic 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. Records of amounts generated shall be provided to TVA. Equipment shall not be temporarily stored in stream floodplains whether overnight or on weekends or holidays.

20. Smoke and Odors - TVA and/or the contractor(s) and subcontractor(s) shall properly store and handle combustible material that could create objectionable smoke, odors, or fumes. The contractor and subcontractor(s) shall not burn refuse such as trash, rags, tires, plastics, or other debris.
21. Noise Control - TVA and/or the contractor and subcontractor(s) 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, dismantling, or forensic 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.
22. 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.
23. Damages - The movement of construction, dismantling, or forensic 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 and subcontractor(s) will be responsible for erosion damage caused by his or her actions and employees 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 project to be handled shall be documented with an implementation schedule and a property owner signature obtained.
24. Final Site Cleanup and Inspection - The contractor's designated person shall ensure that all construction, dismantling, or forensic-related debris, products, materials, and wastes are properly handled, labeled as required, and removed from the site. Upon completion of those activities, that person and a TVA-designated person shall walk down the site and complete an approval inspection.

## References

Tennessee Valley Authority. 2017. A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance

Activities, Revision 3. Edited by G. Behel, S. Benefield, R. Brannon, C. Buttram, G. Dalton, C. Ellis, C. Henley, T. Korth, T. Giles, A. Masters, J. Melton, R. Smith, J. Turk, T. White, R. Wilson. Chattanooga, TN.: Retrieved from  
<<https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects>>  
(n.d.).

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## Tennessee Valley Authority Site Clearing and Grading Specifications

1. General - The project manager with the clearing and/or grading contractor(s) shall review the environmental evaluation documents for the project or proposed activity (categorical exclusion checklist, environmental assessment, or environmental impact statement) along with all clearing and construction appendices, conditions in applicable general and/or site-specific permits, the storm water pollution prevention plan, open burning or demolition notification requirements, 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 storm water management practices as outlined in TVA's best management practices (BMPs) manual. 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. BMPs shall be installed before general site clearing or grading, with progressive stabilization BMPs applied from the perimeter toward the interior work areas as grading is completed. Any stabilized area that must be disturbed in subsequent steps shall have temporary BMPs installed until work is completed and the area is restabilized.

If the contractor fails to use BMPs or to follow environmental expectations discussed in the prebid, 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. He or she shall secure, or ensure that TVA has **secured, all necessary permits and authorizations and made all appropriate notifications** 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 employees knowledgeable of environmental requirements shall be documented** with copies submitted to TVA's project manager or environmental specialist before work begins. The **contractor and subcontractors will be responsible for meeting all** conditions **specified in permits**. Permit conditions shall be reviewed in prework discussions.
3. Land and Landscape Preservation - The contractor shall exercise care to preserve the condition of cleared soils by avoiding as much compacting and deep scarring as possible in areas not to be developed for buildings, structures, or foundations. 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. The placement of erosion/sediment controls shall begin at the perimeter and work progressively to the interior of the site. Repeated work in an area will require establishment of a ground cover immediately after each disturbance is completed. In areas outside the clearing, borrow, fill, or use and access areas, the natural vegetation shall be protected from damage. The contractor and his or her employees and subcontractors must not deviate from delineated access routes or use areas and must enter the site(s) 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 by modifying the methods of clearing or reclearing, grading, borrow, or fill so that the buffer and sensitive area are protected. Some areas may require planting native low-growing plants or grasses to meet the criteria of regulatory agencies, executive orders, or commitments to special program interests.

4. Streamside Management Zones - The clearing and/or grading contractor(s) 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 (SMZs), tall-growing tree species (trees that would interfere with TVA's National Electrical 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 the 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 Transmission Operations and Maintenance (TOM) 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 access or site 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 prevented from falling into water bodies or immediately removed from streams, ditches, ponds, 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 and 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 quickly grow to "electrical clearance problem" heights. In many circumstances, herbicides labeled for water and wetland use may be used in reclearing.

At substation, switching stations, and communications sites, wetlands are avoided unless there is no feasible alternative.

6. Sensitive Area Preservation - If prehistoric or historic artifacts or features that might be of archaeological or historical significance are discovered during clearing, grading, borrow, or fill operations, the activity shall immediately cease within a 100-foot radius, and a TVA project manager, an environmental specialist, and the TVA 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, grading, borrow and fill, and/or disposal activities shall be performed using BMPs that will prevent erosion and entrance of spillage, contaminants, debris, and other pollutants or objectionable materials into drainageways, surface waters, 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 shall be kept away from streams and ditches and shall be incorporated into the soil. Only materials allowed to be burned under an open burning permit may be incorporated into the soil.

The clearing and grading contractor(s) and subcontractors 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 at least as frequently as required by the permit or good management practices and during periods of high runoff; any necessary repairs will be made as soon as practicable. BMP runoff sampling will be conducted in accordance with permit requirements. Records of all inspections and sampling will be maintained on site, and copies of inspection forms and sampling results will be forwarded to the TVA environmental specialist.

8. Turbidity and Blocking of Streams - If temporary clearing, grading, borrow, or fill 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. In Tennessee, conditions of an Aquatic Resource Alteration Permit shall be met. 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, borrow, fill, or right-of-way disturbance and after sequential disturbance of stabilized areas due to stepwise construction requirement in accordance with applicable permit or regulatory requirements.

On rights-of-way, 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 design or construction access road standards. At any construction site, 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 immediately. Appropriate U.S. Army Corps of Engineers and state permits shall be obtained for stream or wetland crossings.

9. Air Quality Control - The clearing or grading contractor shall take appropriate actions to limit the amount of air emissions created by clearing and disposal operations to be 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. If building renovation or demolition is involved, the required air quality organization shall be notified the minimum 10 days in advance, and if the start date is delayed, renotified to start the clock again.
10. Dust and Mud Control - Clearing, grading, borrow, fill, or transport 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 manufacturer's 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 vehicles will not be performed on the site, right-of-way, or access route. However, if emergency or "have to" situations arise, minimal/temporary maintenance to vehicles will occur in order to mobilize the vehicle to an off-site maintenance shop. Some heavy equipment may have to be serviced on the right-of-way, site, or access route, except in designated sensitive areas. The clearing, grading, borrow, or fill 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 Program Administration or project manager 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, grading, borrow, fill, or construction contractor shall contract a sanitary contractor who will provide sanitary chemical toilets convenient to all principal points of operation for every working party and at each construction step. 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, grading, borrow, fill, or construction contractor and subcontractor(s) shall be responsible for daily cleanup and proper labeling, storage, and disposal of all refuse and debris on the site produced by his or her 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. Records of waste generation shall be maintained for a site and shall be provided to the project manager and environmental specialist assigned to the project.
19. 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. On rights-of-way, 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, site, or access.

Trees that have been cut may not be left on a substation, switching station, or communications site.

20. 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, site, or communications facilities construction is completed. Final seeding will consist of permanent perennial grasses such as those outlined in TVA's *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA, 2017). Exceptions would include those areas designated as native grass planting areas. Initial and final restoration will be performed by the clearing contractor with emphasis on using landscaping materials provided in guidelines for low maintenance native vegetation use.
- 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.
- E. Vegetation designated by the Federal Invasive Species Council must be eliminated at the work site, and equipment being transported from location to location must be inspected to ensure removal and destruction of live material.

#### References

Tennessee Valley Authority. 2017. *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities*, Revision 3. Edited by G. Behel, S. Benefield, R. Brannon, C. Buttram, G. Dalton, C. Ellis, C. Henley, T. Korth, T. Giles, A. Masters, J. Melton, R. Smith, J. Turk, T. White, R. Wilson. Chattanooga, TN.: Retrieved from <https://www.tva.com/Energy/Transmission-System/Transmission-System-Projects> (n.d.).

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# **Tennessee Valley Authority Substation Lighting Guidelines**

## **For Greenfield Sites**

Permanent substation lighting should be a two-stage design. Stage 1 is operated dusk to dawn for fixtures at higher mounting heights, more than 12 feet above the ground, and Stage 2 is switch-controlled for low mounting heights at 12 feet and below.

Stage 1 will be continuous nighttime lighting turned on with a photocell and designed to meet minimum requirements for safety and security. The general purpose of Stage 1 lighting is to light the ground and general area to the fence. Designing Stage 1 continuous lighting should follow Illuminating Engineering Society of North America (IESNA) RP-33-99 recommended practices for maximum lighting at the fence and past the fence, except where National Electrical Safety Code (NESC) requirements supersede these guidelines for safety reasons or *Federal Register* requirements supersede these guidelines for spill-containment facilities. Stage 1 lighting fixtures mounted at an elevation above 12 feet should be the cutoff or full-cutoff type to reduce off-site glare.

The Stage 2 lighting will be provided for temporary operational needs and will only be turned on when required. Stage 2 lighting is intended to provide visibility of substation structures and devices, to operate switches, and to perform tasks. Design of Stage 2 lighting should follow NESC and IESNA RP-7-01 recommended practices for task lighting.

Substation structures should be utilized for mounting Stage 1 and Stage 2 lighting fixtures wherever feasible. Lighting fixtures should be mounted at the minimum elevation required to provide coverage dictated by the required vertical and horizontal light levels and uniformity. Lights may be mounted above an elevation of 40 feet when required for security reasons, such as cameras, or lighting of objects taller than 40 feet.

## **For Minor Modifications to Existing Facilities**

Additional lighting required for substation modifications will follow the basic existing lighting design. To the degree possible, substation structures should be utilized to mount light fixtures. Lighting fixtures may be mounted at an elevation above 40 feet when required for site coverage, security reasons, such as cameras, or lighting of objects taller than 40 feet. All substation lights mounted at an elevation above 12 feet should be cutoff or full-cutoff type, such that no light is emitted from the fixture at lateral angles above 90 degrees (above the horizontal plane) to reduce off-site glare, unless the light is required for operational needs, such as the operation of a disconnect switch mounted at a higher elevation. To the extent possible, lighting additions should follow *Federal Register*, NESC, IESNA RP-7-01, and IESNA RP-33-99 recommended practices for lighting.

The Stage 1 and Stage 2 lighting approach will not be considered for minor modifications because of the difficulty in rearranging wiring circuits for lighting power supply and control. These changes are more appropriately addressed when major modifications are made.

*(For major modifications to existing substations, consideration should be given to implement lighting policies for greenfield sites. This can be determined during site visits and project scoping.)*

## General Design Issues and Design Principle Definitions

- A Good Neighbor. Most of the design constraints are summed up by this principle. Thoughtful consideration of the neighbors is critical to the success of the design.
- Luminaire Optical Properties. Four designations are used for the light control of outdoor lighting fixtures: Full Cutoff (0 percent, <10 percent), Cutoff (<2.5 percent, <10 percent), Semicutoff (<5 percent, < 20 percent), and Noncutoff. These are in terms of a percentage of the lamp's intensity lateral to the fixture and at an angle 10 degrees below the horizontal plane.
- Light Levels. Light levels are determined for both horizontal and vertical surfaces by the appropriate standards. Principally American National Standards Institute (ANSI)/IESNA RP-7-01, IESNA RP-33-99, IESNA *Lighting Handbook*, 9<sup>th</sup> Edition, 2000, blue pages Safety/Security-1, IESNA G-1-03, and the NESC, Section 111.A, should be considered.
- Neighboring Property Uses. The lighting design shall consider ways to reduce light trespass in directions where neighbors are known to exist through light fixture placement and control of the fixture light output.
- Design Standards. Design standards are general engineering guides to proper application of lighting equipment to achieve lighting levels consistent with their recommended standards. Primary design standards are listed under the "Light Levels" definition.
- Physical Security Survey. If warranted, specific lighting needs can be determined through the process outlined in IESNA G-1-03, Annex B, with measurements according to Annex C.
- Television Surveillance. If required, television surveillance provides lighting compatible with the needs of camera visibility, which may or may not enhance human visibility.
- Mounting Heights. Mounting height is a key factor in determining the uniformity or evenness of the light level. For substations, mounting heights are defined as Stage 1 or Stage 2 for high and low under "Mounting Locations." Generally, mounting heights provide good uniformity on the ground or structure when lights are spaced a distance two times the mounting height or lateral distance. Aboveground structures will have decreased uniformity by the same ratio unless this design geometry is considered. For example, lights at a 12-foot mounting height typically provide uniform coverage on the ground 24 feet wide. Spacing between fixtures of 48 feet would provide good uniformity on the ground. When lighting vertical structures, the distance to the light affects the uniformity in the same way.
- Mounting Locations. Low mounting heights are defined as 12 feet and below and high mounting heights are above 12 feet.
- Terrain. Nuisance glare and light trespass are also a function of the substation height above or below the average local terrain, including land contours and vegetation height. Terrain can shield fixtures and reduce lighting control requirements.

- Temporary Lighting Systems. Systems designed for outages and limited to portable systems should have no restrictions due to their temporary nature.
- Permanent Lighting Systems. These systems require the most care due to their persistent effect on the neighbors.
- New Construction Greenfield Sites. These sites have a higher level of care due to the clean slate available to accommodate good lighting design.
- Minor Substation Modifications. Small modifications include substation component replacement and expansions of less than 50 percent of the substation capacity. Following the existing lighting design pattern in these cases is acceptable practice to expand the lighting system coverage.
- Extensive Substation Modifications. Extensive modifications involve site voltages or expansions of more than 50 percent capacity. Lighting should be evaluated by design engineers to determine feasibility of using the design approaches of new construction greenfield sites.
- Safety. Wherever unsafe conditions are present, in the judgment of design engineers, additional lighting is warranted.

## References

IESNA G-1-03, *Guideline on Security Lighting for People, Property, and Public Spaces*

IESNA *Lighting Handbook*, 9<sup>th</sup> Edition, 2000, blue pages Safety/Security-1

IESNA RP-7-01, *Recommended Practice for Lighting Industrial Facilities*

IESNA RP-33-99, *Recommended Practice for Lighting for Exterior Environments*

NESC, Institute of Electrical and Electronic Engineers (IEEE), *ANSI/IEEE C2-2007*, 2007 Edition

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