

**ECONOMIC DEVELOPMENT GRANT PROPOSAL FOR
WASHINGTON COUNTY INDUSTRIAL PARK
ENVIRONMENTAL ASSESSMENT
Washington County, TN (Telford)**

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1.0 PROPOSED ACTION AND NEED

An integral part of Tennessee Valley Authority's (TVA) mission is to promote economic development within the TVA service area. TVA provides financial assistance to help bring to market new/improved sites and facilities within the TVA service area and position communities to compete successfully for new jobs and capital investment. TVA proposes to provide an economic development grant through InvestPrep funds to Washington County (the County) to assist with the development of the Washington County Industrial Park (WCIP). The area of TVA's proposed action (herein referred to as the Project Area) comprises approximately 25.9 acres of the total 37 acres of the WCIP located adjacent to Blalock Road, approximately 1.6 miles northwest of Telford, Tennessee (TN) (see **Figure 1** below and Attachment 1, Figure 1-A). TVA funds would be used for:

- the clearing of approximately 2.1 acres of trees,
- removal of about 1,645 feet of existing fencing,
- permanent fill of 0.32 acre of wetlands at two locations,
- the purchase of wetland credits,
- cut and fill including the grading of 50,000 square-foot (ft²) and 225,000 ft² dirt building pads (and associated equipment storage and lay-down areas),
- construction of a gravel access road,
- construction of two temporary sediment basins and a berm facilitating formation of a detention basin, and
- installation of erosion and sediment controls, and stabilization of disturbed areas after grading activities are completed.

These activities would be completed within the Project Area of the WCIP (Attachment 1, Figure 1-B) in Washington County, TN. The detention basin would be created by construction of a berm located within a portion of a wetland feature at the northwest portion of the Project Area. However, the remainder of the wetland feature, forming the basis of the detention basin, would not be disturbed and is outside of the Project Area.

The proposed grant to the County would assist with grading improvements to put the WCIP in a more marketable position and allow prospects to better envision the development potential. Proposed improvements would lead to an increased probability of achieving TVA's core mission of job creation and capital investment. Pursuant to the National Environmental Policy Action (NEPA) and its implementing regulations 40CFR 1500 – 1508 and TVA's implementing regulations 18 CFR 1318, this Environmental Assessment (EA) evaluates the environmental impacts that would potentially result from TVA's Proposed Action. TVA's decision is whether to provide the requested funding to the County.

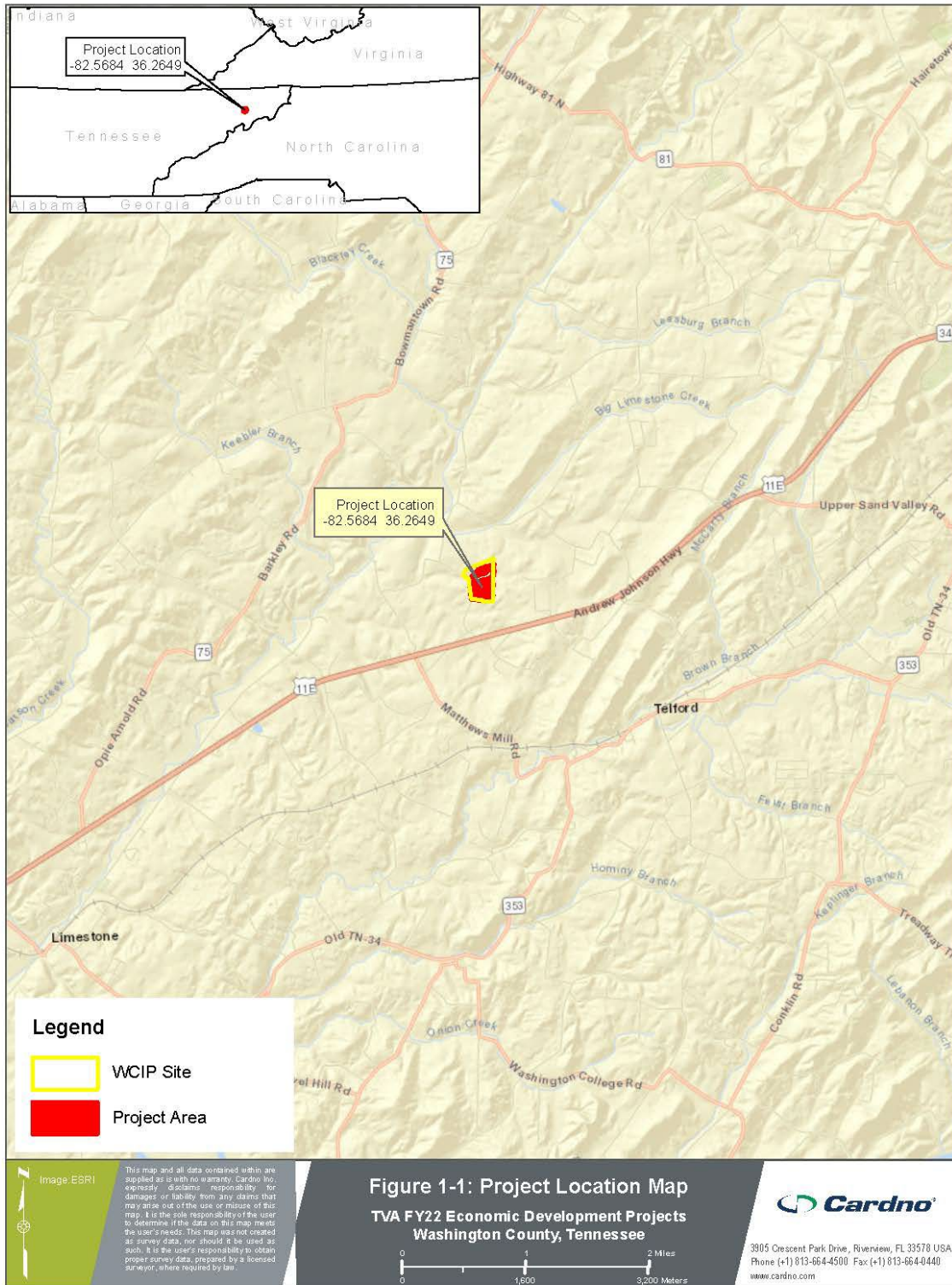


Figure 1 Project Location Map

2.0 OTHER ENVIRONMENTAL REVIEWS AND DOCUMENTATION

Other studies have been performed by Washington County at the WCIP. A Phase I Environmental Site Assessment (Phase I ESA) of the 37-acre WCIP was performed consistent with the procedures included in ASTM E 1527-13 (Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process) by S&ME, Inc. (S&ME 2017a). The purpose of the Phase I ESA was to identify the presence of recognized environmental conditions or other environmental liabilities within the Project Area. A preliminary geotechnical investigation of the 37-acre WCIP was performed by S&ME, Inc. in October 2017 (S&ME 2017b). The purpose of the geotechnical investigation was to explore the general site and subsurface conditions within the Project Area. S&ME, Inc. also performed a geophysical exploration of the 37-acre WCIP in April 2020 (S&ME 2020a). The purpose of geophysical exploration was to identify any changes in subsurface conditions or materials with an emphasis on karst features and to identify any potential buried obstructions such as underground storage tanks. S&ME, Inc. conducted an on-site wetland delineation and hydrologic determination in April 2020 (S&ME 2020b). The purpose of the wetland delineation determination and hydrologic determination was to identify wetlands and waterbodies jurisdictional to the United States Army Corps of Engineers (USACE) and the Tennessee Department of Environment and Conservation (TDEC). An Archaeological and Historic Resources Survey and report was also conducted and prepared by S&ME, Inc. in April 2020 (S&ME 2020c). The purpose of the archaeological survey was to identify and record archaeological resources that may have been present on the 37-acre WCIP and impacted by any proposed construction in the Project Area. A follow-up historic structures survey was conducted in November 2021 by Cardno, Inc. (Cardno 2021).

The Phase I ESA, geotechnical investigation report, geophysical report, wetland delineation, archaeological survey, and historical structures survey were used in the preparation of this EA.

3.0 ALTERNATIVES

Based on internal scoping, TVA determined that there are two reasonable alternatives to assess under the NEPA: the No Action Alternative and the Action Alternative.

3.1 The No Action Alternative

Under the No Action Alternative, TVA would not provide InvestPrep funds to the County. TVA would not be furthering its mission of promoting economic development by assisting the local community to compete successfully for new jobs and capital investment through the Proposed Action. If the County were to obtain alternate funding and proceed with its current plans, the overall environmental consequences would be similar to those expected from implementing the Action Alternative. In the event the project is postponed, any environmental effects would be delayed for the duration of the postponement. If the project were cancelled, no direct environmental effects are anticipated, as environmental conditions on the site would remain essentially unchanged from the current conditions for the foreseeable future.

3.2 The Action Alternative

Under the Action Alternative, TVA would provide InvestPrep funds to the County for site improvements to the WCIP. These improvements would include:

- the clearing of approximately 2.1 acres of trees,

- removal of about 1,645 feet of existing fencing,
- permanent fill of 0.32 acre of wetlands at two locations,
- the purchase of wetland credits,
- cut and fill including the grading of 50,000 ft² and 225,000 ft² dirt building pads (and associated equipment storage and lay-down areas),
- construction of a gravel access road,
- construction of two temporary sediment basins totaling 0.6 acre,
- a berm to facilitate formation of a detention basin, and
- installation of erosion and sediment controls, and stabilization of disturbed areas after grading activities are completed.

These activities would be completed within the Project Area of the WCIP (Attachment 1, Figure 1-B).

Site activities required for the Action Alternative would occur over approximately 6 months and would require a small workforce that would likely be drawn from a local contractor. Trees would be cut and burned on-site, and stumps would be removed and burned on-site as well.

The County, or its contractors, would obtain all required permits and authorizations, and in compliance with those permits take appropriate measures, such as mitigation and implementing best management practices (BMPs) and best construction practices, to minimize or reduce the potential environmental effects of the proposed project to insignificant levels. These practices would include but are not limited to installation of sediment and erosion controls (silt fences, sediment traps, etc.), management of fugitive dust, daytime work hours, and other appropriate measures.

The Action Alternative does not include the assessment of activities that may be directly or indirectly associated with adjacent lots already developed or under construction or the eventual build-out, occupation, and future use of the Project Area. The future use of the site has not been fully defined. Given this uncertainty, an analysis of the potential impacts for development of the adjacent lots or future use of the site is beyond the scope of this EA.

TVA's preferred alternative is the Action Alternative.

4.0 AFFECTED ENVIRONMENT AND ANTICIPATED IMPACTS

4.1 Site Description

The 25.9-acre Project Area is located on the 37-acre WCIP in Washington County, Tennessee adjacent to Blalock Road (which provides access), approximately 1.6 miles northwest of Telford, Tennessee (Attachment 1, Figure 1-A).

The site is situated within existing crop and pastureland and is currently zoned for heavy industrial manufacturing. The Project Area contains a large pole barn (about 4,400 square feet), a pond, and wetlands. The pole barn would not be affected by the proposed TVA InvestPrep scope of work. There are existing industrial buildings to the east of the site, an elementary school and pastureland to the south, and pastureland to the north and west with several residential structures.

Access to the property is off of Blalock Road, which borders the site to the west (Attachment 1, Figure 1-A). The Project Area is dominated by pastureland. There is a row of trees on the west side of the WCIP that line Blalock Road, a row of trees to the south, as well as a row of trees that run across the north side of the WCIP. A large pond is located within the 37-acre WCIP, but outside of the Project Area (Attachment 1, Figure 1-B).

The Project Area is relatively flat with elevations varying between approximately 1,440 feet to 1,500 feet above mean sea level (Attachment 1, Figure 1-C). Floodplains in the vicinity of the Project Area are depicted in Attachment 1, Figure 1-D. One palustrine emergent (PEM) wetland was identified adjacent to an isolated open water pond, connected hydrologically on three sides (east, south, and west) within the proposed WCIP boundary (Appendix A, Attachment 1, Figure 1-E and Figure 1-F). The current land use is pasture/crop land.

4.2 Impacts Evaluated

The Phase I ESA did not identify any current or historical chemical, petroleum, or hazardous substance operations or storage areas or locations within the Project Area that would indicate the presence of solid or hazardous wastes (S&ME 2017a). Further, no demolition or construction waste activities are associated with the Action Alternative. Therefore, the Proposed Action is not expected to result in significant impacts from the creation or disposal of solid and hazardous wastes.

The Federal Emergency Management Agency (FEMA) flood insurance rate map for Washington County, Tennessee (Attachment 1, Figure 1-D), (panel number 47179C0140D, effective 9/29/2006) and the United States Geological Survey (USGS) 1:24,000 topographic map for Washington County, Tennessee indicate the Project Area would be located outside identified 100-year floodplains, which would be consistent with Executive Order (EO) 11988. The Proposed Action would therefore have no significant impact on floodplains and their natural and beneficial values.

According to the field survey conducted in April 2020, a single isolated pond was identified adjacent to the proposed WCIP (S&ME 2020b). Due to the pond's isolation from surface water inflows and outflows and lack of littoral or aquatic vegetation and its historical use for cattle watering, the aquatic community within the pond is expected to be lacking in diversity and of low quality. Effects to surface waters outside the Project Area because of stormwater runoff during construction activities would be temporary in nature and minimized to the extent practical by implementation of BMPs during construction. A query of the TVA Regional Natural Heritage Database indicated that no federally or state listed aquatic species are known to occur within the Big Limestone Creek 10-digit HUC (0601010805) watershed. Therefore, it is expected there would be no effect of the Proposed Action on aquatic ecology or federally or state-listed threatened and endangered aquatic species.

Natural areas include ecologically significant sites; federal, state, or local park lands; national or state forests; wilderness areas; scenic areas; wildlife management areas; greenways; trails; United States National Park Service (USNPS) Nationwide Rivers Inventory (NRI) segments; and Wild and Scenic Rivers (WSRs). Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, United States Department of Agriculture (USDA), United States Forest Service (USFS), State of Tennessee) to protect and maintain certain ecological and/or recreational features. A review of data from the TVA Regional Natural Heritage Database, USNPS

NRI database (USNPS 2021), WSR database (WSR 2021), and the U.S. Environmental Protection Agency (USEPA) NEPA Assist Tool (USEPA 2020) indicated that the Bowmantown Wetland was located 0.7 mile north of the WCIP (managed by the Tennessee Wildlife Resources Agency) and a Wetland Reserve Parcel (managed by the Natural Resources Conservation Service) was located 2.3 miles southwest of the WCIP. Given the distance between the Project Area and these parcels, the Proposed Action is not expected to result in impacts to these resources.

There are no parks or outdoor recreation areas in the immediate vicinity of the Project Area. Brights Zoo is located approximately 1.7 miles to the southwest of the Project Area, while Wetlands Water Park is about 4 miles northeast of the Project Area. Given the substantial distance between the Project Area and these areas, the Proposed Action is not expected to have any impact on use of these recreational areas.

There would be no impact to land use and prime farmland as the Project Area is located within a property zoned for heavy industrial manufacturing and the Proposed Action would not result in a change to the zoned land use.

TVA has determined that the Proposed Action, subsequent to TVA's selection of the Action Alternative, would have no impact on solid and hazardous wastes, floodplains, aquatic ecology, managed and natural areas, recreation, prime farmland, or land use as discussed above. Therefore, potential impacts to these resources are not described in further detail in this EA.

Resources that could potentially be impacted (negatively or positively) directly, indirectly, or cumulatively by implementing the Action Alternative include air quality and climate change, groundwater, soil erosion and surface water, wetlands, terrestrial zoology, botany, and archaeology and historic structures and sites. Implementation of the Action Alternative could create potential impacts to the human environment, including visual effects, noise, socioeconomics and environmental justice, and transportation issues. Potential impacts to resources and impacts to the human environment resulting from implementation of the Action Alternative are discussed in detail below.

4.2.1 Air Quality and Climate Change

Federal and state regulations protect ambient air quality. With authority granted by the Clean Air Act (CAA) 42 U.S.C. 7401 et seq. as amended in 1977 and 1990, the USEPA established National Ambient Air Quality Standards (NAAQS) to protect human health and public welfare. The USEPA codified NAAQS in 40 Code of Federal Regulations (CFR) 50 for the following "criteria pollutants:" nitrogen dioxide (NO₂), carbon monoxide (CO), ozone, sulfur dioxide (SO₂), lead, particulate matter (PM) with an aerodynamic diameter equal to or less than 10 microns (PM₁₀), and PM with an aerodynamic diameter equal to or less than 2.5 microns (PM_{2.5}). The NAAQS reflect the relationship between pollutant concentrations and health and welfare effects. Primary standards protect human health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards are designed to protect public welfare, including visibility (i.e. smog), animals, crops, vegetation, and buildings. These standards reflect the latest scientific knowledge and have an adequate margin of safety intended to address uncertainties and provide a reasonable degree of protection. The air quality data in Washington County, Tennessee is not available; therefore, Cardno cannot confirm if the County is in attainment with respect to the criteria pollutants (USEPA 2021).

Other pollutants, such as hazardous air pollutants (HAPs) and greenhouse gases (GHGs) are also a consideration in air quality impact analyses. Section 112(b) of the CAA lists HAPs, also known as toxic air pollutants or air toxics, because they present a threat of adverse human health effects or adverse environmental effects. Although there are no applicable ambient air quality standards for HAPs, their emissions are limited through permit thresholds and technology standards as required by the CAA.

GHGs are gases that trap heat in the atmosphere, are non-toxic and non-hazardous at normal ambient concentrations. At this time, there are no applicable ambient air quality standards or emission limits for GHGs under the CAA. GHGs occur in the atmosphere both naturally and resulting from human activities, such as the burning of fossil fuels. GHG emissions due to human activity are the main cause of increased atmospheric concentration of GHGs since the industrial age and are the primary contributor to climate change. The principal GHGs are carbon dioxide (CO₂), methane, and nitrous oxide.

Air quality impacts associated with activities under the Action Alternative include emissions from fossil fuel-fired equipment, fugitive dust from ground disturbances, and emissions from the on-site burning of wood debris. Fossil fuel-fired equipment is a source of combustion emissions, including nitrogen oxides (NO_x), CO, VOCs, SO₂, PM₁₀, PM_{2.5}, GHGs, and small amounts of HAPs. Gasoline and diesel engines used as a result of the Action Alternative are expected to comply with the USEPA mobile source regulations in 40 CFR Part 85 for on-road engines and 40 CFR Part 89 for non-road engines. These regulations are designed to minimize emissions and require a maximum allowable sulfur content in diesel fuel of 15 parts per million (ppm).

Fugitive dust is a source of respirable airborne PM, including PM₁₀ and PM_{2.5}, which could result from ground disturbances such as land clearing, grading, excavation, and travel on unpaved roads. The amount of dust generated is a function of the activity, silt and moisture content of the soil, wind speed, frequency of precipitation, vehicle traffic, vehicle types, and roadway characteristics. The County, or its contractors, would be expected to comply with TDEC Air Pollution Control Rule 1200-3-8, which requires reasonable actions to prevent PM from becoming airborne. The County, or its contractors, would adhere to any special air quality requirements due to the proximity to Grandview Elementary School. Such reasonable actions include the use of water or chemicals for control of dust in construction operations on dirt roads and stockpiles, as needed.

With the use of BMPs and other required measures described above to reduce emissions associated with the Action Alternative, an estimated 6-month construction duration, air quality impacts would be minor, temporary, localized, and within the normal daily variation of mobile emissions from a construction site; and would not be anticipated to result in any violation of applicable ambient air quality standards or impact regional air quality.

Concerning climate change, trees, like other green plants, are carbon sinks that use photosynthesis to convert CO₂ into sugar, cellulose, and other carbon-containing carbohydrates that they use for food and growth. Carbon sequestration is the process by which carbon sinks remove CO₂ from the atmosphere. Although forests do release some CO₂ from natural processes such as decay and respiration, a healthy forest typically stores carbon at a greater rate than it releases carbon. The clearing of approximately 2.1 acres of land containing trees for the Action Alternative would result in a minor loss of carbon sequestration capacity.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, similar emissions from equipment, ground disturbances, and burning would result in similar air quality and climate change impacts as those described above for the Action Alternative. If the County were not able to secure the funding for the actions described in this EA, emissions associated from equipment, ground disturbances, and burning would not occur and there would be no impacts to air quality and climate change from the No Action Alternative.

4.2.2 Groundwater

The Project Area is located within the Valley and Ridge Province (USNPS 2017 and USGS 2021a). The Valley Ridge Province extends southwest to northeast and is characterized by a sequence of folded and faulted, Paleozoic sedimentary rocks that form a series of alternating valleys and ridges that extend from Alabama and Georgia to New York (USGS 1995).

In the eastern part of Tennessee, the principal aquifers in the Valley and Ridge Province consist of carbonate rocks that are primarily Cambrian and Ordovician in age, with minor Silurian, Devonian, and Mississippian rocks also present (USGS 1995). Locally, this system is referred to as the East Tennessee aquifer system and consists of soluble carbonate rocks and some easily eroded shales underlie the valleys while more erosion-resistant siltstone, sandstone, and some cherty dolomite underlie ridges (USGS 1986). Water quality in the carbonate aquifers of the Valley and Ridge Province is characterized as hard, with dissolved solids concentrations of 170 milligrams per liter or less. Due to the complex network of fractures, bedding planes, and solution openings in the carbonate rocks in areas with thin residuum overlying the substrate, water recharges rapidly and, water quality in these aquifers is susceptible to contamination by human activities (USGS 1995). Recharge occurs primarily along the flanks of the ridges and groundwater flow is generally from the ridges (higher groundwater levels) toward major streams and center of the valleys where groundwater levels are lower (USGS 1995).

Implementation of the Action Alternative would result in ground disturbance during construction activities. Tree clearing and fence removal would result in minor ground disturbance at shallow depths. Site grading and compaction for development of two dirt building pads, construction of a gravel access road, two temporary sediment basins and a berm facilitating formation of a detention basin would result in greater ground disturbance at moderate depths. Ground disturbances are not anticipated to be at depths that would intersect public groundwater supplies (approximately 50 to 250 feet beneath the land surface [USGS 2016]) or result in significant impacts to groundwater resources. The geophysical investigation conducted on-site by S&ME, Inc. used electrical resistivity tomography (ERT) to identify subsurface conditions within the Project Area. This process sends known electrical currents into the ground and measures the voltage potential to determine the subsurface conditions. The geophysical analysis indicates that the overburden within the Project Area consists mostly of clays with some areas of potential boulders and or clays with higher chert content. The bedrock at the Project Area is approximately 10 feet to 50 feet below land surface. Shallow aquifers could sustain minor impacts from changes in overland water flow and recharge caused by clearing, grading and construction of temporary sediment basins and a detention basin within the Project Area. Water infiltration, which is normally enhanced by vegetation, would be reduced until vegetation is re-established. In addition, near-surface soil compaction caused by heavy construction vehicles could reduce the ability of soil to absorb water. De-compaction of soils could be accomplished by plowing or other seedbed

preparation as part of the revegetation process. These minor impacts would be temporary and would not significantly affect groundwater resources. A Phase I ESA was completed in November 2017 by S&ME, Inc., which indicates that the Project Area is undeveloped with the exception of a 4,400 square-foot pole barn, and the ESA conducted in 2017 found no adverse environmental conditions on the Project Area. Land use of the Project Area was primarily agricultural prior to 2012. As such, it is unlikely that construction activities would encounter hazardous substances during the aforementioned site improvements. Furthermore, it is expected that the County, or its contractors, would conduct operations involving chemical or fuel storage or resupply and equipment and vehicle servicing with care to avoid leakage, spillage, and subsequent ground water contamination. Implementation of the Action Alternative would have insignificant effects upon groundwater.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, similar ground disturbance would occur, resulting in similar impacts to groundwater resources as those described above for the Action Alternative. If the County were not able to secure the funding for the actions described in this EA, ground disturbance associated with tree clearing, site grading and compaction for development of two dirt building pads, construction of a gravel access road, two temporary sediment basins and a berm facilitating formation of a detention basin would not occur and there would be no impacts to groundwater resources.

4.2.3 Soil Erosion and Surface Water

The Project Area is in Washington County, Tennessee in the Ridge and Valley ecoregion. The Project Area drains to streams within the Big Limestone Creek watershed (Hydrologic Unit Code [HUC]-12 060101080502). According to a literature review associated with the on-site wetland delineation and hydrologic determination that was conducted in April 2020, one blue-line perennial stream (unnamed tributary to Big Limestone Creek) and a pond were depicted on the USGS topographic quadrangle map for Leesburg, Tennessee within the 37-acre WCIP (Attachment 1, Figure 1-E). The unnamed tributary to Big Limestone Creek was depicted as beginning offsite to the east, flowing across the center of the site, and exiting the site to the west. This tributary is not shown on the TDEC database of streams, and therefore, was likely not ever assessed for quality by TDEC (S&ME 2020b). According to a field review of the Project Area conducted on April 8, 2020, no streams, wet-weather conveyances, upland drainage swales, or other drainage features were observed on the property (S&ME 2020b). There is a pond within the WCIP, but it is located outside of the Project Area.

Precipitation in the vicinity of the Project Area averages about 44 inches per year. The average annual air temperature ranges from an average low of 25 degrees Fahrenheit in January to an average high of 85 degrees Fahrenheit in July (BestPlaces 2022). The stream flow of Big Limestone Creek located north of the Project Area varies with rainfall and averages approximately 3.61 cubic feet per second, per square mile of drainage area (USEPA 2022).

The federal Clean Water Act (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 the USEPA. The term “303(d) list” refers to the list of impaired and threatened streams and water bodies identified by the state. As stated, the unnamed stream depicted in the database review

(but not observed on-site) is a tributary of Big Limestone Creek, which is located to the north of the WCIP. The unnamed stream is not listed on Tennessee's 303(d) list, but this portion of Big Limestone Creek in Washington County is listed as impaired for *E. coli*, nitrate/nitrite, total phosphorus, and sediment/siltation due to livestock grazing in riparian or shoreline zones (TDEC 2022a). Big Limestone Creek is classified for fish and aquatic life, recreation, irrigation, and livestock watering and wildlife (TDEC 2013).

Soil types and descriptions were obtained from the Web Soil Survey (NRCS 2022) (Attachment 1, Figure 1-G). Soil types mapped within the Project Area include Greendale silt loam (0-6%, rarely flooded), Lindside silt loam (0-3%, occasionally flooded, warm), Montevallo channery silt loam (5-12%), Bowmantown silt loam (2-6% and 6-12%), and Dewey-Collegedale complex (6-15%, eroded and 15-25%, eroded). According to the preliminary geotechnical investigation that was conducted in October 2017, all of the listed soils on-site have a depth to water table of greater than two feet, and the majority of the soils are well-drained and are not hydric. None of the on-site soils are listed as ponding; therefore, the chance of ponding is nearly zero percent in any year. Also, none of the listed soils flood, with the exception of Greendale and Lindside silt loam. Since Greendale silt loam soils rarely flood, flooding is unlikely but possible under unusual weather conditions; the chance of flooding is 1 to 5 percent in any year. Lindside silt loam soils occasionally flood, meaning that flooding occurs infrequently under normal weather conditions; the chance of flooding is 5 to 50 percent in any year (S&ME 2017b).

Implementation of the Action Alternative would result in construction activities that have the potential to temporarily affect surface water via stormwater runoff. Soil erosion and sedimentation can clog small streams and threaten aquatic life. It is expected that the County, or its contractors, would comply with all appropriate federal, state, and local permit requirements. Appropriate BMPs would be followed, and all proposed project activities would be conducted in a manner to ensure that waste materials are contained, and the introduction of pollution materials to the receiving waters would be minimized. In addition, the County, or its contractors, would be required to obtain coverage under the 2021 National Pollutant and Discharge Elimination System (NPDES) General Permit for Discharges Associated with Construction Activities (TNR100000) since the site grading activities would be greater than one acre. This permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would identify specific BMPs to address construction-related activities that would be adopted to minimize stormwater impacts. Part of these BMPs would be the construction of two temporary sediment basins and a berm facilitating formation of a stormwater detention basin to control sediment discharges from the Project Area. BMPs, as described in the Tennessee Erosion and Sediment Control Handbook (TDEC 2012) would be used during site development to avoid contamination of surface water in the Project Area.

As stated, there are no streams, wet-weather conveyances, upland drainage swales, or other drainage features located within the Project Area that would be affected by the Action Alternative (Attachment 1, Figure 1-E).

Impervious surfaces prevent rain from percolating through the soil and result in additional runoff of water and pollutants into storm drains, ditches, and streams. The Action Alternative could increase impervious flows in the Project Area through construction of the dirt building pads. No paving or concrete would occur as part of the Proposed Action. Under the required NPDES permit, all flows would need to be properly treated with either implementation of the proper BMPs or to

engineer a discharge drainage system that could handle any increased flows prior to discharge into the outfall(s).

It is expected that portable toilets would be provided for the construction workforce as needed. These toilets would be pumped out regularly, and the sewage would be transported by tanker truck to a publicly-owned wastewater treatment plant that accepts pump out. Equipment washing and dust control discharges would be handled in accordance with BMPs described in the SWPPP for water-only cleaning. Proper implementation of BMPs and other controls for the Action Alternative would be expected to result in only minor temporary impacts to surface waters.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, similar site activities would occur, resulting in similar impacts to surface water resources as those described above for the Action Alternative. If the County were not able to secure the funding for the actions described in this EA, disturbance associated with the Proposed Action would not occur and there would be no additional impacts from current agricultural use for soil erosion or to surface water resources.

4.2.4 Wetlands

Wetlands are areas inundated by surface or groundwater often enough to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, mud flats, and natural ponds.

Activities in wetlands are regulated by state and federal agencies to ensure no more than minimal impacts to the aquatic environment and no net loss of wetland resources. Under CWA Section 404, activities resulting in the discharge of dredge or fill material in jurisdictional wetlands, and any secondary wetland impacts, such as forested wetland clearing, must be authorized by the USACE through a Nationwide, Regional, or Individual Permit. CWA Section 401 mandates state water quality certification for projects requiring USACE approval and permitting. In Tennessee, an aquatic resource alteration permit (ARAP) authorized by TDEC provides water quality certification under CWA Section 401. An ARAP is required for any alteration to the physical, chemical, or biological properties of any waters of the state, including wetlands, pursuant to the Tennessee Water Quality Control Act (§69-3-108, 0400-40-07) and in alignment with Tennessee's anti-degradation policy (§69-3-108, 0400-40-04). Compliance with USACE and TDEC permitting is required for regulated activities within jurisdictional wetlands, which could require mitigation based on their review of TVA's proposed impacts. Lastly, EO 11990 requires federal agencies such as TVA to minimize wetland destruction, loss, or degradation, and preserve and enhance natural and beneficial wetland values, while carrying out agency responsibilities.

As noted in Section 2, a field survey was conducted in April of 2020 to detect wetlands in the proposed WCIP (S&ME 2020b). Surveys were performed according to USACE standards (Environmental Laboratory 1987) which require documentation of hydrophytic vegetation (Reed 1997), hydric soil, and wetland hydrology. Broader definitions of wetlands, such as the one used by the United States Fish and Wildlife Service (USFWS) (Cowardin et al. 1979), and as defined under 18 CFR Part 1318.40, were also considered in this review.

A single palustrine emergent (PEM) wetland was identified adjacent to an isolated open water pond on three sides (east, south, and west) within the proposed WCIP boundary (Appendix A, Figure 1-F). PEM wetlands are comprised of herbaceous/low-growing species of plants. The

wetland was noted as in an area used for pasture and/or hay production. The wetland was noted as saturated and inundated at various portions. Wetland species observed included soft rush (*Juncus effusus*), common boneset (*Eupatorium perfoliatum*), and blue joint grass (*Calamagrostis canadensis*).

Under the Action Alternative, wetlands would be impacted at two locations within the Project Area. These impacts would include 0.23 acre of wetland fill along Blalock Road involving berm construction facilitating formation of a stormwater detention basin farther east within the remainder of the wetland feature. The remainder of the wetland feature serving as the detention basin would not be directly disturbed, however, it is possible that surface water or groundwater flow into the wetland feature could be affected by grading. Potential modifications to inflows into the wetland would be expected to be minor since flow direction would not be altered by the Proposed Action. In addition, 0.09 acre of wetland located south of the existing pond would be permanently impacted by construction of a temporary sediment basin. Wetland impact activities would require permits from the USACE and TDEC as noted above. Mitigation of the combined 0.32 acre of impacted wetlands would be offset through the purchase of wetland mitigation credits. Standard construction BMPs would minimize these impacts to the extent practicable.

Because the Action Alternative would result in impacts on wetlands, TVA released this EA as a Draft on March 21, 2022, for a 15-day public review and comment period, which ended on April 4, 2022. An electronic version of the document was posted on the TVA website where comments could also be submitted online. No comments were received.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, similar site activities would occur, resulting in similar impacts to wetlands as those described above for the Action Alternative. If the County were not able to secure the funding for the actions described in this EA, disturbance associated with the Proposed Action would not occur and there would be no impacts to wetlands.

4.2.5 Terrestrial Zoology

4.2.5.1 Wildlife

The Project Area is comprised of abandoned pastureland with narrow tree lines (largely small cedars and hackberry) that follow existing fences through the property. A small patch of mature deciduous hardwood trees also exists within the Project Area. A man-made farm pond exists in the WCIP, but is outside of the Project Area. A pole barn is also within the Project Area but impacts to this barn are outside of the TVA InvestPrep scope of work. The landscape in the surrounding area is predominately rural and agricultural/pastoral lands with small fragments of deciduous hardwood forests.

Fields covered in herbaceous growth provide habitat for common birds such as field sparrow (*Spizella pusilla*), indigo bunting (*P. cyanea*), white-eyed vireo (*Vireo griseus*) and yellow-breasted chat (*Icteria virens*) (National Geographic 2002). Sparrows (*Spizella* spp.) and eastern bluebirds (*Sialia sialis*) were observed during field surveys in February 2022. Mammals such as bobcat (*Lynx rufus*), coyote (*Canis latrans*), eastern mole (*Scalopus aquaticus*), golden mouse (*Ochrotomys nuttalli*), groundhog (*Marmota monax*), and white-tailed deer (*Odocoileus virginianus*) also are likely to utilize habitat like this in this region (Whitaker 1996). Evidence of deer (tracks), coyote (scat), and groundhog (burrows) were observed during field surveys in February 2022. Reptiles that may use these habitats in this region include black racer (*Coluber*

constrictor priapus), corn snake (*Pantherophis guttatus*), eastern kingsnake (*Lampropeltis getula*), gray rat snake (*Pantherophis spiloides*), and red milksnake (*Lampropeltis triangulum*) (Gibbons and Dorcas 2005). Amphibians that may use this area are American toad (*Anaxyrus americanus*) and Fowler's toad (*Anaxyrus fowleri*) (Powell et al. 2016).

The narrow tree lines along the existing fences comprised of deciduous hardwood species, shrubs, and cedars adjacent to open grassy fields provide habitat for common birds such as Carolina chickadee (*Poecile carolinensis*), Carolina wren (*T. ludovicianus*), cedar waxwings (*Bombycilla cedrorum*), chipping sparrow (*Spizella passerine*), eastern blue bird, eastern towhee (*Pipilo erythrophthalmus*), golden crowned kinglet (*R. satrapa*), northern cardinal (*Cardinalis cardinalis*), northern flicker (*C. auratus*), northern mockingbird (*Mimus polyglottos*), prairie warbler (*Setophaga discolor*), pine warbler (*Setophaga pinus*), red-tailed hawk (*Buteo jamaicensis*), song sparrow (*Melospiza melodia*), tufted titmouse (*Baeolophus bicolor*), and white-throated sparrow (*Zonotrichia albicollis*) (National Geographic 2002). During a field survey in February 2022, the following avian species were observed using the tree lines in the Project Area: American robin (*Turdus migratorius*), northern flicker, eastern bluebird, northern cardinal, sparrow species, European starling (*Sturnus vulgaris*) (non-native invasive). Mammals found in these habitats include common raccoon (*P. lotor*), eastern gray squirrel (*Sciurus carolinensis*), hispid cotton rat (*Sigmodon hispidus*), and Virginia opossum (*Didelphis virginiana*) (Whitaker 1996). Common amphibian and reptile species also use similarly disturbed habitats including American toad, eastern box turtle (*T. Carolina*), eastern garter snake (*Thamnophis sirtalis sirtalis*), and Fowler's toad (Powell et al. 2016).

One small pond that is within the WCIP, but outside of the Project Area, may provide suitable habitat for a multitude of amphibian and reptilian species. Amphibians likely to use the area include American bullfrog (*Lithobates catesbeianus*), Cope's gray tree frog (*D. chrysoscelis*), eastern red-spotted newt (*Notophthalmus viridescens*), northern cricket frog (*Acris crepitans*), southern leopard frog (*Lithobates sphenoccephalus*), and upland chorus frog (*Pseudacris feriarum*). Reptiles utilizing these wet areas and the surrounding habitat include garter, northern water (*Nerodia sipedon*), rat (*Elaphe [Pantherophis] obsoleta*) and ring-necked (*D. punctatus*) snakes (Powell et al. 2016, Gibbons and Dorcas 2005).

No cave records were identified within three miles of the Project Area during a review of the TVA Regional Natural Heritage Database in September 2021. Caves were not observed during a field survey of the Project Area in February 2022.

No records of heronries or aggregations of other migratory birds have been documented within three miles of the Project Area and none were observed during field survey of the Project Area in February 2022. Review of the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) tool in September 2021 identified two migratory bird species of conservation concern that could occur within the Project Area: red-headed woodpecker (*M. erythrocephalus*) and rusty blackbird (*E. carolinus*). The small patch of mature deciduous trees within the Project Area could provide suitable nesting and foraging habitat for red-headed woodpeckers (Conner & Adkisson 1977). Rusty blackbirds are winter residents in Tennessee that utilize forested wetland habitats (Greenberg & Matsuoka 2010) although no forested wetlands exist within the Project Area.

Under the Action Alternative, approximately 2.1 acres of trees and shrubs would be cleared. This would result in displacement of any wildlife (primarily common, habituated species) currently using

the area. Direct effects to some individuals could occur if those individuals are immobile during the time of habitat removal (e.g., during breeding/nesting seasons). Habitat removal likely would disperse mobile wildlife into surrounding areas in attempts to find new food resources, shelter, and to reestablish territories. Due to the amount of similarly suitable habitat in areas immediately adjacent to the Project Area, populations of common wildlife species likely would not be impacted by the proposed project actions.

The USFWS IPaC tool identified two migratory birds of conservation concern that could occur within the Project Area. No suitable habitat (forested wetlands) for rusty blackbirds exists within the Project Area. Additionally, work is proposed to occur between May and October when this species is not present in this region. Nesting and foraging habitat does exist for the red-headed woodpecker within the Project Area. Non-nesting individuals present on the landscape would be expected to flush to nearby suitable habitat. Direct impacts may occur if red-headed woodpeckers are nesting within the Project Area. However, due to the relatively small amount of suitable habitat, the Proposed Action is not expected to impact populations of red-headed woodpeckers.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, similar site activities would occur, resulting in similar impacts as those described above for the Action Alternative. If the County were not able to secure the funding for the actions described in this EA, TVA would not provide matching funding to assist with the development of the WCIP. Soil and vegetation would remain in their current state and tree clearing and earth moving would not occur in association with this project. Terrestrial animals and their habitats would not be affected under the No Action Alternative.

4.2.5.2 Threatened and Endangered Species (Terrestrial Animals)

Review of the TVA Regional Natural Heritage Database in September 2021 resulted in records of two state species of conservation concern (common barn owl and savannah sparrow) within three miles of the Project Area. Records of one federally protected species (bald eagle (*Haliaeetus leucocephalus*)) and two federally listed species (gray bat (*Myotis grisescens*) and northern long-eared bat (*Myotis septentrionalis*)) are known from Washington County, Tennessee. Review of the USFWS IPaC tool in September 2021 identified one additional federally listed species (Indiana bat (*Myotis sodalists*)) and one candidate species for federal listing (monarch butterfly (*Danaus plexippus*)) that could be expected to occur within the Project Area. A full species list and conservation statuses can be found in **Table 4-1**. Species-specific information and habitat suitability within the Project Area are discussed below.

Table 4-1. Federally listed terrestrial animal species reported from Washington County, Tennessee and other species of conservation concern documented within three miles of the Project Area for Washington County Industrial Park, Invest Prep Project, ESCS 39496¹

Common Name	Scientific Name	Status2	
		Federal	State3
Birds			
Bald eagle ⁴	<i>Haliaeetus leucocephalus</i>	DM	D(S3)
Common barn owl	<i>Tyto alba</i>	-	-(S3)
Savannah sparrow	<i>Passerculus sandwichensis</i>	-	-(S1BS4N)

Common Name	Scientific Name	Status2	
		Federal	State3
Invertebrates			
Monarch butterfly ^{5,6}	<i>Danaus plexippus</i>	C	-(S1)
Mammals			
Gray bat ⁴	<i>Myotis grisescens</i>	E	E(S2)
Indiana bat ⁵	<i>Myotis sodalis</i>	E	E(S1)
Northern long-eared bat ⁴	<i>Myotis septentrionalis</i>	T	T(S1S2)
¹ Source: TVA Regional Natural Heritage Database, extracted 9/22/2021 and USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/), accessed 9/22/2021. ² Status Codes: C = Candidate species; D = Deemed in Need of Management; DM = Delisted and Monitored; E = Endangered; T = Threatened. ³ State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; B = Breeding Population; N = Non-breeding Population. ⁴ Species known from Washington County, Tennessee but not from within three miles of the project footprint. ⁵ Species that has not been documented within three miles of the project footprint or within Washington County, Tennessee; USFWS has determined this species could occur within the project area. ⁶ Historically this species has not been tracked by state or federal heritage programs.			

Bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). This species is associated with large mature trees capable of supporting their nests that can weigh several hundred pounds and are typically built near larger waterways where they forage primarily for fish (USFWS 2007a). Bald eagles are most reproductively successful in areas where human disturbance is minimized (Wilson et. al. 2018). Adults exhibit high pair and nest site fidelity throughout their lifetime (Jenkins and Jackman 1993). One bald eagle nest record is known from Washington County, Tennessee, approximately 14.6 miles from the Project Area. As of January 2022, the nest is active and actively monitored by East Tennessee State University using remote video monitoring. The Project Area consists largely of abandoned agricultural fields and hedgerows consisting mostly of cedar and hackberry trees. A small agricultural pond surrounded by wetlands exists within the boundaries of the WCIP, but outside of the Project Area. No bald eagles, nests, or foraging habitats were observed during field reviews of the Project Area.

Common barn owls (*Tyto alba*) inhabit dense grasslands, meadows, prairies, and often can be found around human habitation. Structurally complex landscapes offering a mix of forest edges, hedgerows, ditches, cavities (man-made and natural), and undisturbed areas are preferred (Martinez & Zuberogoitia 2004). Common barn owls forage over grasslands, feeding primarily on meadow voles (*Microtus pennsylvanicus*) and short-tailed shrews (*B. brevicauda*) (Clark & Bunck 1991). Barn owls will nest in a variety of structures including, but not limited to, tree cavities, nest boxes, man-made structures, cliffsides, or caves. This species can breed year-round with multiple broods per year, but one brood per year is typical in Tennessee with peak nesting occurring during the spring through fall (Nicholson 1997). A record of road killed common barn owl was documented approximately 1.6 miles away from the Project Area. Additionally, during field review of the Project Area, an individual barn owl was observed roosting in the pole barn that exists within the Project Area, but would not be impacted by the TVA InvestPrep scope of work. Given the amount of owl pellets observed on the ground, it appears to be a long-term roost site. Potential foraging habitat for this species is present in the Project Area as much of the area is grassland (abandoned agricultural field) surrounded by hedgerows, and some small forest patches exist

immediately outside of the Project Area along the northeastern and southeastern project footprint boundaries.

Savannah sparrows (*Passerculus sandwichensis*) are small migratory songbirds that are typically associated with grasslands and fallow fields, where they feed on seeds of grasses and other vegetation. In Tennessee, savannah sparrows are most often observed as winter migrants, but small numbers have been documented breeding in the northeastern part of the state (Nicholson 1997). Breeding savannah sparrows prefer to build nests in areas with low, dense vegetation away from tree canopy or shrub cover (Swanson 1998). An adult savannah sparrow with two fledglings was observed in a field approximately 1.7 miles from the Project Area. Suitable low, dense grassy habitat is present throughout the Project Area.

The monarch butterfly is a highly migratory species, with eastern United States (U.S.) populations overwintering in Mexico. Monarch populations typically return to the eastern U.S. in April (Davis and Howard 2005). Summer breeding habitat 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 (NatureServe 2021). The early successional field within the Project Area consists of several wildflower and other flowering plant species that provide suitable foraging and breeding habitat for adult monarchs. Milkweed plants were observed during a field survey by a TVA Terrestrial Zoologist. Though this species has not been historically tracked by state or federal heritage programs, the USFWS IPaC tool determined that this species could occur within the Project Area. This species was not present in the region at the time field surveys were completed.

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (USFWS 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). One gray bat record is known from Washington County, Tennessee, from a mist-net capture record approximately 11.3 miles from the Project Area. No caves are known within three miles of the Project Area, and no caves were observed during field surveys. No evidence of bats (guano or urine staining) was observed during field surveys in the pole barn that is within the Project Area. The pole barn would not be affected by the TVA InvestPrep scope of work. One pond is within the WCIP, but outside of the Project Area that could be used as foraging habitat.

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 (USFWS 2007b, Kurta et al. 2002). Indiana bats are known to change roost trees frequently throughout the season, while still maintaining site fidelity, returning to the same summer roosting areas in subsequent years (USFWS 2007). Foraging occurs along riparian areas and along the tops of trees, forested edges, and tree lines. There are no records of Indiana bats within three miles of the Project Area or within Washington County, Tennessee. However, review of the USFWS IPaC tool, determined that this species could occur within the 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 3 inches in diameter). 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 2014). There are six records of northern long-eared bat in Washington County, Tennessee. The closest of these is a mist net capture approximately 8.9 miles away from the Project Area.

No known caves or suitable winter roosting structures exist in the Project Area. Based on the 2020 Range-Wide Indiana Bat Survey Guidelines (USFWS 2020), TVA has determined that some trees (0.45 acre) proposed for removal do provide suitable habitat for summer roosting Indiana bat and northern long-eared bat. Though most of the trees proposed for removal along the fence line are smaller cedars and hackberry trees, a few snags and other live hardwood species with suitable cracks and crevices were observed within the Project Area. Small fragments of forest exist along the eastern border of the WCIP that offer suitable forest edge foraging habitat. A pond documented within the WCIP, but outside of the Project Area offers additional foraging habitat. A pole barn exists within the WCIP. No evidence of bat use (guano, urine staining) of the pole barn was observed during field surveys.

Under the Action Alternative, TVA would provide matching funding to Washington County to assist with the development of the WCIP that includes the following proposed actions: tree clearing and burning, wetland credits purchase, and the construction of two dirt building pads, a gravel access road, and a stormwater detention pond. Approximately 2.1 acres of trees and shrubs would be cleared.

Due to the distance from known records to the Project Area (approximately 14.6 miles), no bald eagle nests would be impacted by the Proposed Action. Nesting and foraging habitat is not present within the Project Area. Project actions are in compliance with the National Bald Eagle Management Guidelines. Bald eagles would not be impacted by the Proposed Action.

Foraging habitat for common barn owl is found throughout the Project Area and would be impacted through grading and road construction. Additionally, a common barn owl was observed roosting in the pole barn on the project site during a field survey of the Project Area in February 2022. Removal of the pole barn is outside of the TVA InvestPrep project scope. However, TVA is working with Washington County to voluntarily install one or two barn owl boxes in less active portions of the site or on an immediately adjacent field where foraging may occur. Following nest box installation, it is recommended that Washington County demolish the building only when there are no eggs or chicks in the barn. Barn owl nesting may be less common in the months of August and January-March. With the installation of alternative nesting sites and avoidance measures around active nests significant impacts to barn owls are not anticipated.

Grading is proposed to begin in May, when savannah sparrows have the potential to be nesting within the Project Area. Due to the low numbers of savannah sparrows observed in this region during the breeding season, direct impacts to this species are unlikely.

Monarch butterfly foraging and breeding habitat exists throughout the Project Area. Milkweed plants were observed during field surveys of the Project Area. Grading and road construction would impact monarch butterfly habitat within the Project Area. Several areas adjacent to the Project Area offer suitable habitat that adult individuals could utilize if they are disturbed from the

area during the time of construction. This species is currently listed under the Endangered Species Act (ESA) as a candidate species and is not subject to Section 7 consultation under the ESA. Impacts to the monarch butterfly are not anticipated as a result of this project.

Three additional federally listed or protected species were addressed based on the potential for the species to occur in the Project Area. All of these (gray bat, Indiana bat, and northern long-eared bat) have the potential to utilize the Project Area.

No caves or other hibernacula for gray bat, Indiana bat or northern long-eared bat exist in the project footprint or would be impacted by the Proposed Action. Approximately 0.45 acre of suitable summer roosting habitat for Indiana bat and northern long-eared bat does occur in the Project Area. Tree lines also offer foraging habitat for gray bat, Indiana and northern long-eared bat. A pond exists within the boundary of the project site but is outside of the Project Area, and no impacts to bat foraging habitat would be expected. Tree removal and burning is proposed to begin in May 2022. To avoid direct impacts to Indiana bat and northern long-eared bat while they are birthing and rearing pups (June 1 – July 31), any tree removal and burning not completed by June 1 could begin again anytime between August 1 and May 31. Direct impacts could occur to individuals if they are roosting in trees in the Project Area during the non-winter season (March 31 – May 31; August 1 – October 15). However, individuals roosting during this time would be expected to be mobile and able to be flush to nearby suitable habitat. Removal of suitable habitat in winter (October 15 – March 31) would avoid direct impacts to these species as bats are roosting underground at that time.

A number of activities associated with the proposed project, including tree removal and burning, were addressed in TVA's programmatic consultation with the USFWS on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and completed in April 2018. For those activities with potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on page 5 of the TVA Bat Strategy Project Screening Form and need to be reviewed/implemented as part of the proposed project. Considering the scope of the proposed project actions, distance to known bat records, and implementation of BMPs and conservation measures listed in the Project Screening Form, significant impacts to gray bat, Indiana bat, and northern long-eared bat are not anticipated as a result of this project.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, similar site activities would occur, resulting in similar impacts as those described above for the Action Alternative. If the County were not able to secure the funding for the actions described in this EA, TVA would not provide matching funding to assist with the development of the WCIP. Soil and vegetation would remain in their current state and tree clearing and earth moving would not occur in association with this project. Threatened and endangered terrestrial animals and their habitats would not be affected under the No Action Alternative.

4.2.6 Botany

4.2.6.1 Vegetation

The Project Area is located in the Ridge and Valley Ecoregion. This is a relatively low-lying region between the Blue Ridge Mountains and Cumberland Plateau. Land cover in the area is predominantly agricultural, urban and industrial, or areas of thick forest. Soils in the ecoregion

vary in productivity with vegetation most often characterized by white oak forests, bottomland hardwood forests, and sycamore-ash-elm riparian forests. (USGS 2021b).

Based on existing studies and a desktop review of past and current site conditions, the WCIP appears to have been utilized as agricultural land for at least the past 25 years. The site is also bordered by agricultural fields to the north, south, and west, and an industrial park to the east (S&ME 2020).

The WCIP is comprised of open fields, tree-lined fencerows, a barn, and an open water farm pond. Upland plant species documented during the wetlands delineation on-site included: brushy blue stem (*Andropogon virginicus*), dogfennel (*Eupatorium capillifolium*), and goldenrod (*Solidago canadensis*). Other dominant species observed during the April 2020 survey include tall rye fescue (*Festuca arundinacea*), horse nettle (*Solanum carolinense*), dock (*Rumex sp.*), vetch (*Vicia sativa*), Queen Anne's lace (*Daucus carota*), and sweet vernal grass (*Anthoxanthum odoratum*), Johnson grass (*Sorghum halepense*), and catchweed bedstraw (*Galium aparine*). Dominant hydrophytic species identified in the wetland consisted of soft rush (*Juncus effusus*), nodding sedge (*Carex gynandra*), tall rye fescue, and bluejoint grass (*Calamagrostis canadensis*). The site has been heavily disturbed in the past and does not support high quality plant communities with significant conservation value.

Implementation of the Action Alternative would not result in negative impacts to native vegetation or forest on any appreciable scale. Adoption of this alternative would result in disturbance of the entire Project Area except for the pole barn that exists within the Project Area, but would not be impacted by the TVA InvestPrep scope of work. All vegetation would be removed, and the area would be graded. Impacts to vegetation may be permanent, but the vegetation found within the Project Area is comprised of non-native weeds and early successional plants that have little conservation value.

Under the No Action Alternative, the Project Area would remain in its current condition and no work would occur unless alternative funding was secured by the County. The Project Area would continue to be dominated by non-native and early successional species indicative of disturbed habitats. Any changes to vegetation on-site would be the result of other natural or anthropogenic factors. If alternative funding was secured by the County, impacts to vegetation would be similar to those described for the Action Alternative.

4.2.6.2 Threatened and Endangered Plant Species

A December 2021 query of the TVA Regional Natural Heritage Database indicates that no state-listed or federally listed plant species have been previously reported from within a five-mile vicinity of the proposed Project Area. No federally threatened plant species have been reported within Washington County, however, twenty-one state-listed species have been observed within Washington County. **Table 4-2** shows the State listing and ranking of the species occurring within Washington County.

Table 4-2 Plant Species of Conservation Concern Previously reported within Washington County, TN¹

Common Name	Scientific Name	TN State Status ²	State Rank ³	Habitat ⁴
Plants				
Climbing fumitory	<i>Adlumia fungiosa</i>	T	S2	Rich mesic woods
American barberry	<i>Berberis canadensis</i>	S	S2	Rocky woods and river bars
Matricary grapefern	<i>Botrychium matricariifolium</i>	S	S1	Mountain woods and thickets
Blunt-lobe grapefern	<i>Botrychium oneidense</i>	S	S1	Moist forests
Piratebush	<i>Buckleya distichophylla</i>	T	S2	Rocky mountain woods w/hemlock
Mountain bittercress	<i>Cardamine clematidis</i>	T	S2	High elevation seeps
Fraser's sedge	<i>Cymophyllus fraserianus</i>	S	S3	Mixed mesophytic forests
Mountain bush-honeysuckle	<i>Diervilla sessilifolia</i> var. <i>rivularis</i>	T	S2	Dry cliffs and bluffs
Branching Whitlow-wort	<i>Draba ramosissima</i>	S	S2	Calcareous bluffs
Dwarf rattlesnake-plantain	<i>Goodyera repens</i>	S	S1	Moist conifer/rhododendron woods
American water-pennywort	<i>Hydrocotyle americana</i>	E	S1	Wet soils and pools
American fly-honeysuckle	<i>Lonicera canadensis</i>	T	S1	Mountain woods and streams
Mountain honeysuckle	<i>Lonicera dioica</i>	S	S2	Mountain woods and thickets
Broadleaf bunchflower	<i>Melanthium latifolium</i>	E	S1S2	Oak forest
Northern evening primrose	<i>Oenothera parviflora</i>	S	S1	Disturbed open areas
American ginseng	<i>Panax quinquefolius</i>	S-CE	S3S4	Rich woods
Fringed black bindweed	<i>Polygonum cilinode</i>	T	S1S2	Dry rocky woods and thickets
Wild pink	<i>Silene caroliniana</i> ssp. <i>pennsylvanica</i>	T	S1S2	Rocky bluffs
Northern white cedar	<i>Thuja occidentalis</i>	-	S3	No data
Southern nodding trillium	<i>Trillium rugelii</i>	E	S2	Rich mountain woods
Carolina hemlock	<i>Tsuga caroliniana</i>	T	S3	Dry ridges
¹ Source: TVA and Tennessee Natural Heritage Database, queried December 2021 ² Status Codes: T = Threatened; S = Special Concern; E = Endangered; CE = Commercially Exploited ³ State Ranks: S1 = Extremely rare and Critically Imperiled; S2 = Very rare and Imperiled; S3 = Rare and uncommon; S4 = Widespread ⁴ Habitat: TDEC 2022b				

Implementation of the Action Alternative would not result in negative impacts to plant species of concern. Based on previous reports and studies detailing on-site conditions, the Project Area has been heavily disturbed in the past and does not support high quality plant communities with significant conservation value. No designated critical habitat for plants occurs in the proposed Project Area. Previous agricultural activities within the Project Area have resulted in significant disturbance that makes the parcel unsuitable for threatened or endangered plant species.

Similar to the Action Alternative, under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, there would be no direct or indirect impacts to state and federally listed threatened and endangered

plant species. If the County were not able to secure the funding for the actions described in this EA, the proposed disturbances would not occur and existing site conditions would likely be unchanged, also resulting in no impacts to state and federally listed threatened and endangered plant species.

4.2.7 Archaeology and Historic Structures and Sites

Historic and cultural resources, including archaeological resources, are protected under various federal laws, including: the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires federal agencies to consult with the respective State Historic Preservation Officer (SHPO) when proposed federal actions could affect these resources.

A previous cultural resource survey covering TVA's Project Area footprint and the surrounding area was undertaken in 2020 by S&ME, Inc. (Carpino et al 2020). While TVA found the archaeological portion of the report to be adequate, TVA determined that the architectural portion of the report did not adequately define and investigate the project (Area of Potential Effect) APE. S&ME conducted the archaeological investigation on 37 acres that completely encompasses TVA's 25.9-acre project footprint. The investigation consisted of pedestrian walkover and subsurface investigation with 36 shovel test probes. No artifacts, subsurface features, or other indication of archaeological resources were documented by the survey.

To address adequate coverage of the project APE, TVA contracted with Cardno now Stantec to carry out a supplemental historic structures survey in November 2021. As a result of Cardno's architectural survey, nine structures were identified within half a mile of the project footprint that are 50 years of age or older. Cardno recommends and TVA concurs that only one of these structures are eligible for the NRHP. The Mclin/Correll House, was previously recorded by Tennessee Historical Commission (THC) and was previously recommended eligible for the NRHP. The house is currently situated on approximately two acres of property. Although the structure itself is not within the APE, the much larger parcel historically associated with the house is within the APE and therefore it was also included as part of the survey report. Due to the fact that the house itself is not visible from the project footprint, Cardo recommends and TVA concurs that the Mclin/Correl house would experience no effects from this project.

TVA therefore finds that the proposed undertaking would result in no effects to historic properties included in, or eligible for inclusion in, the National Register of Historic Places. In a letter dated February 2, 2022, the Tennessee State Historic Preservation Office concurred with TVA's "no effect" finding (Attachment 3). Pursuant to 36 CFR Part 800.3(f)(2). TVA consulted with federally recognized Indian tribes regarding properties within the project's area of potential effect that may be of religious and cultural significance to them and eligible for the NRHP. TVA received no objections from federally recognized tribes for this undertaking.

Similar to the Action Alternative, under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, there would still be no impacts to cultural resources. If the County were not able to secure the funding for the actions described in this EA, the proposed disturbances would not occur and existing site conditions would likely be unchanged, also resulting in no impacts to cultural resources.

4.2.8 Visual

The 25.9-acre Project Area consists mainly of open agricultural land with small patches of wooded/forested areas in the southern and northeastern portions of the parcel. The Project Area is bordered by agricultural lands to the north, east, south, and west. The visual landscape consists of rural, flat areas with primarily agricultural land and open fields, and some scattered riparian corridors.

The Project Area would be directly adjacent to Blalock Road to the west and approximately 0.18-mile north of Grandview Elementary School, followed by Andrew Johnson Highway (U.S. Route 11E). The elementary school is situated on an upland hill that provides some visual screening between Andrew Johnson Highway and the Project Area. Riparian corridors also provide some visual screening between the Project Area and Blalock Road, as well as screening between parcel boundaries adjacent to the Project Area. Rural residences located sporadically within a 0.5-mile radius of the Project Area (along John Carson Road, State Hill Road, and an unnamed access road off Precision Boulevard) may have some vegetation buffers and topographic relief for screening. Residential areas along Blalock Road immediately adjacent to the south have a direct line of sight to the Project Area. Similar to other residences in the area, there are some sporadic trees or forested riparian corridors on or near these properties that may provide some visual screening between the residences and the Project Area.

Additionally, the Project Area is approximately five miles west-northwest of the Great Smoky Mountain Byway. Due to the distance to the National Scenic Byway, no impacts are anticipated.

Construction vehicles and equipment visible during construction activities would have a minor visual impact over the temporary construction period as well as a minor permanent impact due to minor tree removal and rough grading. Drivers along Blalock Road would have direct views of the Project Area. However, there are other developed areas along the roadway within 0.5-mile, and any changes to the views would be similar to other areas along the road. While users of Blalock Road and John Carson Road may notice a change in the viewshed, this change would be minor given the brief period that drivers would be in the area. The views from the residences adjacent to the Project Area, as well as those residences along Blalock Road would experience moderate change. Current views from those areas would change from open pasture/agricultural land with sporadic tree cover to developed industrial land. However, the distance of these residences from the Project Area and the scattered forested riparian corridors would provide some visual screening. Implementation of the Action Alternative would result in a minor impact to visual quality for residents in the viewshed.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, the Proposed Action would occur, resulting in similar direct and indirect visual quality impacts as described above for the Action Alternative. If the County were not able to secure the funding for the actions described in this EA, the Proposed Action would not occur, and existing site conditions would likely be maintained resulting in no visual quality impacts.

4.2.9 Noise

Existing ambient noise levels, or background noise levels, are the current sounds from natural and artificial sources at sensitive noise receptors. The magnitude and frequency of background noise at any given location may vary considerably over the course of a day or night and throughout

the year. The variations are caused in part by weather conditions, seasonal vegetative cover, and human activity. Existing sources of noise in the vicinity of the Project Area are primarily associated with traffic along the surrounding roads and the surrounding businesses and residences.

Noise impacts associated with construction activities under the Action Alternative would be from construction equipment. Construction activities would involve operation of an excavator, bulldozer, dump truck, or similar vehicles and heavy machinery over the temporary duration of construction. Construction equipment noise levels are temporary and rarely steady; they fluctuate depending on the number and type of vehicles and equipment in use at any given time. Construction-related sound levels experienced by a sensitive noise receptor in the vicinity of construction activity would be a function of distance, other noise sources, and the presence and extent of vegetation, structures, and intervening topography between the noise source and receptor.

Primary sensitive noise receptors in the area include the elementary school located about 0.18-mile south of the Project Area and the residences within the 0.5-mile radius (northeast, west, and south) of the Project Area. The noise from the proposed project would be localized and temporary, and no receptor would be exposed to significant noise levels for an extended period of time. Further, construction activities would be expected to be conducted during daylight hours only, when ambient noise levels are often higher and most individuals are less sensitive to noise. Thus, noise-related impacts resulting from implementation of the Action Alternative are anticipated to be temporary and minor.

Similar to the Action Alternative, under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this EA from outside sources, there would be similar impacts to noise receptors as described above. If the County were not able to secure the funding for the actions described in this EA, the proposed disturbances would not occur and existing site conditions would likely be unchanged, resulting in no impacts to noise receptors.

4.2.10 Socioeconomics and Environmental Justice

This section evaluates the potential impact of the Action Alternative on socioeconomic resources. It also considers the range of communities impacted to determine whether the Action Alternative is likely to have a disproportionate and adverse impact on minority and low-income populations.

This analysis focuses on the state, county, and locality within which the Action Alternative would occur. Publicly available statistics generated by the United States Census Bureau and the United States Bureau of Labor Statistics were used to characterize socioeconomic conditions in the host state (Tennessee), county (Washington), and the nearest locality (Jonesborough, TN) profiled by the U.S. Census Bureau (**Table 4-3**). Details of the Action Alternative were then used to evaluate likely effects on existing socioeconomic resources. The demographics and income of the host counties and locality were considered, relative to the demographics and wealth levels at the state level, to identify the potential for a disproportionate and adverse impact on minority and low-income populations, which is commonly referred to as an evaluation of Environmental Justice.

Table 4-3 Population, Demographics, Income, and Employment in the Host State, County and Locality

	Tennessee	Washington County	Jonesborough, TN
Population¹			
April 2020 Population	6,910,840	133,001	5,860
April 2010 Population	6,346,105	122,979	5,051
Population, Percent Change	8.9%	8.1%	16.0%
Population per Square Mile	153.9	376.7	981.8
Demographics			
White Alone, not Hispanic or Latino	73.5%	88.2%	92.4%
Black or African American Alone	17.1%	4.5%	4.3%
American Indian and Alaska Native Alone	0.5%	0.5%	0.0%
Asian Alone	2.0%	1.7%	1.3%
Native Hawaiian and Other Pacific Islander Alone	0.1%	0.1%	0.0%
Two or More Races	2.0%	2.1%	0.5%
Hispanic or Latino (of any race)	5.7%	3.6%	1.8%
Income¹			
Median Household Income	\$53,320	\$48,334	\$56,550
Per Capita Income	\$29,859	\$29,656	\$29,617
Percent with Income Below the Poverty Level	13.6%	13.2%	8.4%
Employment (Not Seasonally Adjusted): October 2021²			
Labor Force	3,296,326	59,225	(Not Available)
Employed	3,186,080	57,417	(Not Available)
Unemployed	110,246	1,808	(Not Available)
Unemployment Rate (%)	3.3 %	3.1 %	(Not Available)
¹ Source: United States Census Bureau (2021)			
² Source: United States Bureau of Labor Statistics (2021)			

An evaluation of the potential for Environmental Justice effects found that:

- Relative to the average Tennessee resident, the residents of Washington County live at a higher population density but lower population growth. Relative to the average Tennessee resident, the residents of Jonesborough, Tennessee live at much greater population density and higher population growth.
- Relative to the average Tennessee resident, the residents of Washington County are less likely to self-identify as a minority race or ethnicity. Relative to the average Tennessee resident, the residents of Jonesborough, Tennessee are less likely to self-identify as a minority race or ethnicity.

- Median household income is greater in Tennessee than in Washington County. However, median household income is lower in Tennessee than in Jonesborough, Tennessee. Per capita income levels are very similar across all three areas. Residents of Washington County and of Jonesborough, Tennessee are less likely to live below the poverty level than residents of Tennessee as a whole.
- The unemployment rate in Washington County is lower than the statewide unemployment rate in Tennessee.

During project review, approximately two dozen scattered residences were identified within 0.5-mile of the WCIP, primarily to the north and west. EPA's EJScreen Tool was used to identify the following demographic characteristics for this area. Relative to the state, these neighborhoods in aggregate have a lower percentile population of color, have a lower level of low-income population, have higher rates of linguistic isolation and have a higher level of population with less than high school education.

As described in Section 1.0 (Proposed Action and Need), the Action Alternative would include tree clearing, fence removal, impacts to 0.32 acre of wetlands (offset by the purchase of wetland credits), grading and stabilization of two dirt pads (50,000 ft² and 225,000 ft²) with an on-site borrow area, construction of a gravel access road, construction of two temporary sediment basins and a berm facilitating formation of a detention basin. This effort would require a small workforce, likely drawn from existing contractors working on similar projects in the region. Implementation of the Action Alternative is not anticipated to materially impact the local economy or workforce. In addition, no negative socioeconomic impacts are expected from the project, therefore no disproportionate negative impacts are anticipated to minority or economically disadvantaged populations as a result of the Action Alternative. Positive indirect impacts may be noted through the increase in employment as a result of the Action Alternative. Further, as described throughout this document, environmental effects associated with the Action Alternative would be minor and would generally be contained within the 25.9-acre Project Area.

Under the No Action Alternative, if the County were able to secure the funding for the proposed TVA-funded actions described in this Environmental Assessment from outside sources, similar activities would occur which would result in socioeconomic impacts similar to those described in the preceding paragraph. If the County was not able to secure the funding for the action, the economic activity and socioeconomic changes would not occur.

4.2.11 Transportation

The Project Area would be accessed during construction activities from Blalock Road. The site entrances would be located on the western side of the Project Area and would require installation of an improved entrance from Blalock Road.

Blalock Road is a local road that provides access to a municipal development and approximately three rural properties south of the Project Area, and multiple rural properties and undeveloped land to the north of the Project Area. Blalock Road is paved along its length, is sufficiently wide for a single lane of traffic in each direction. Based on preliminary review of Google Streetview images (recorded July 2013, as supplemented by review of Google Earth imagery obtained on October 17, 2019), the road is in good condition with narrow grassy verges. The site entrance location and configuration should consider safe sight distances and other safety concerns for the traffic that would enter Blalock Road from the property. Necessary precautions would be expected

to be taken during mobilization and de-mobilization such as reduced speed in areas of poor visibility or poor road condition, with other precautions such as a flagman or traffic control to be considered if required. Blalock Road terminates to the north at the intersection of Shanks and John Carson Road and at Veterans Parkway (U.S. Numbered Highway 321) to the south.

U.S. Numbered Highway 321 (US 321) provides access to multiple commercial and residential properties to the east and west. Based on a review of Google Streetview images (recorded September 2021) the road is in good condition, has wide vegetated verges, is sufficiently wide for two lanes of traffic in each direction, and provides a dedicated turning lane for access to Blalock Road from east and west. U.S. 321 is defined as a Freeway and Expressway by the Functional Classification System for Washington County (Tennessee Department of Transportation [TDOT] 2019). Normal care would be expected to be taken by workers entering U.S. 321 with regards to traffic safety.

There are no traffic count stations located on Blalock Road. It is anticipated that existing traffic volumes for these local roads would be minor as they provide access to a limited number of other sites. Because of the anticipated limited volume of workers on the site required for tree clearing activities, grading, and the short timeframe of the proposed work, direct or indirect impacts to local traffic are anticipated to be temporary and minor.

Based on a review of TDOT historical traffic data (TDOT 2020) the nearest traffic count stations are located on Hwy 321. The 2020 annual average daily traffic count (AADT) for the relevant stations are presented in **Table 4-4** below.

Table 4-4 Tennessee Department of Transportation Traffic Count Data for the Project Area¹

Route Description	Location ID	Distance from Project Area (Miles)	Year	AADT
U.S. 321 (2 way count)	90000055	4.77	2020	16,187
U.S. 321 (2 way count)	90000050	3.70	2020	10,967

¹ Source: Tennessee Department of Transportation ([Annual Average Daily Traffic \(AADT\) \(tn.gov\)](https://www.tn.gov)), extracted 1/03/2022

In the context of the existing AADT road volumes of these highways, the anticipated traffic generated by the proposed activities would be minor and temporary. It is anticipated that implementation of the Action Alternative would generate minor traffic associated with construction activities and have a temporary and negligible impact on overall traffic volumes and level of service of U.S. 321.

Under the No Action Alternative, if the County were able to secure the funding for the actions described in this EA from other sources, or if the County were to proceed without any supplemental funding, construction of project components would occur, also resulting in temporary and negligible impact on overall traffic volumes and level of service. If the County were not able to secure the funding for the actions described in this EA there would be no impact to overall traffic volumes and level of service.

5.0 PERMITS, LICENSES, AND APPROVALS

The Action Alternative would result in greater than one acre of earth disturbing activities; therefore, it would be necessary to obtain coverage under the 2021 (or current version) NPDES General Permit for Discharges Associated with Construction Activity (TNR100000). Coverage would require submittal of a Notice of Intent (NOI) and development of a site-specific SWPPP. The County, or its contractors, would be responsible for obtaining local, state, or federal permits, licenses, and approvals necessary for the project. Additionally, the Action Alternative would result in permanent impacts to 0.32 acre of wetlands and would require a standalone ARAP from TDEC and, if determined to be WOTUS, would also require a CWA Section 404 permit from the USACE and a CWA Section 401 Water Quality Certification. The County, or its contractors, would be responsible for obtaining local, state, or federal permits, licenses, and approvals necessary for the Project.

6.0 BEST MANGEMENT PRACTICES AND MITIGATION MEASURES

To minimize or reduce the environmental effects of site activities associated with the Action Alternative, the County, or its contractors, are expected to ensure all clearing and grading activities conducted are in compliance with stormwater permitting requirements and use applicable BMPs to minimize and control erosion and fugitive dust during these actions.

Operations involving chemical or fuel storage or resupply and vehicle servicing are expected to be handled outside of riparian areas and in such a manner as to prevent these items from reaching a watercourse. Earthen berms or other effective means are expected to be installed to protect nearby stream channels from direct surface runoff. Servicing of equipment and vehicles is expected to be done with care to avoid leakage, spillage, and subsequent surface or groundwater contamination. Oil waste, filters, and other litter are expected to be collected and disposed of properly.

Specific conservation measures would be implemented as a part of the Action Alternative to reduce effects to Indiana bat and northern long-eared bat. These measures, including no tree removal in June or July to protect non-volant bat pups, are identified in the TVA Bat Strategy Project Screening Form (Attachment 2).

7.0 LIST OF PREPARERS

Table 7-1 summarizes the expertise and contribution made to the EA by the Project Team.

Table 7-1 Environmental Assessment Project Team

Name/Education	Experience	Project Role
TVA		
Brooke Davis B.S. Forestry/ Wildlife Biology and B.S. Environmental Science	22 years in Project Management, Managing and Performing NEPA Analyses; ESA Compliance; CWA Evaluations; NHPA Compliance	Economic Development Grant Project NEPA Compliance Manager
Adam Dattilo M.S., Forestry; B.S., Natural Resource Conservation Management	21 years in ecological restoration and plant ecology, 16 years in botany	Botany, Threatened and Endangered Species QA/QC

Name/Education	Experience	Project Role
Kerry Nichols <i>Ph.D. Anthropology, M.A. Anthropology, B.A. Political Science</i>	21 years of experience as a field archaeologist and SHPO project reviewer	Cultural resources, NHPA Section 106 compliance
Craig Phillips <i>M.S., and B.S., Wildlife and Fisheries Science</i>	15 years Sampling and Hydrologic Determinations for Streams and Wet-Weather Conveyances; 10 years in Environmental Reviews	Aquatic Ecology
Carrie Williamson, P.E., CFM <i>B.S. and M.S., Civil Engineering</i>	9 years in Floodplain and Flood Risk; 11 years in Compliance Monitoring; 3 years in River Forecasting	Floodplains QA/QC
Elizabeth Burton Hamrick <i>M.S., Wildlife and Fisheries Science, University of Tennessee B.A., Biology, B.A., Anthropology, Grinnell College</i>	22 years in biological field studies, 9 years in biological compliance, NEPA compliance, and ESA consultation for T&E terrestrial animals	Terrestrial zoology, threatened and endangered species
Cardno		
Douglas Mooneyhan <i>M.S., Biology, Tennessee Technological University B.S., Wildlife and Fisheries Science, University of Tennessee</i>	31 years in managing and performing environmental studies, Project Manager for a variety of different project types including NEPA, construction monitoring, natural resources, water resources, and fisheries biology	EA Program Manager QA/QC
Amanda Koonjebharry, PMP <i>B.S, Zoology and Botany, University of the West Indies</i>	20 years in environmental resource surveys and permitting, including EIS and EA preparation, compliance monitoring, state and federal wetland and waterbody permitting and mitigation, protected species surveys and coordination, and wetland delineations	EA Project Manager QA/QC Purpose and Need, Air Quality and Climate Change, Other Environmental Documentation, Alternatives, Site Description, Permits, Licenses and Approvals, Best Management Practices and Mitigation Measures
Jaclyn Martin <i>M.S., Environmental Sciences, Swedish University of Agricultural Sciences, Uppsala, Sweden M.S., Environmental Sciences, University of Natural Resources and Life Sciences, Vienna, Austria B.S., Biology, Winthrop University, South Carolina</i>	8 years in environmental consulting in the preparation and review of NEPA compliance reports, environmental assessments, and permitting for a variety of telecommunication, alternative energy, and FERC-regulated projects	Air Quality and Climate Change, Visual
Duane Simpson <i>M.A., Anthropology, University of Arkansas B.A., Anthropology, Ohio University</i>	27 years in archaeological consulting including management of projects across the southeast and midatlantic regions. Principal Investigator for over 15 years.	Archaeology

Name/Education	Experience	Project Role
<p>Rachel Kennedy <i>M.H.P., Historic Preservation, University of Kentucky</i> B.A., Political Science and History, University of Kentucky</p>	<p>21 years of experience working in non-profit, governmental, and private sectors with all aspects of preservation planning, from interpretation of the Secretary of the Interior's Standards for the Treatment of Historic Properties to cultural landscape examinations to identifying, evaluating, and listing properties to the NRHP. Meets the Secretary of the Interior's Professional Qualifications Standards for History and Architectural History, per 36 CFR, Part 61.</p>	<p>Historic Structures and Sites</p>
<p>Josh Yates, P.G. <i>M.S., Geology, University of South Florida</i> <i>B.S. Natural Resources Management and Engineering, University of Connecticut</i></p>	<p>16 years of hydrogeologic assessments and water resources permitting experience. This experience includes water supply planning, hydrogeologic investigations, groundwater modeling, water use permitting, well construction oversight, EIS and EA preparation, minimum flow and level (MFL) impact analysis, monitoring well network design, aquifer performance tests, and GIS analysis.</p>	<p>Groundwater</p>
<p>Trey Fitzpatrick <i>M.S., Environmental Management, Samford University</i> <i>B.S., Biology, Samford University</i></p>	<p>7 years of experience working on natural gas projects primarily in the southeastern United States. Support for projects regulated by the Federal Energy Regulatory Commission, as well as smaller pipeline projects in the southeast, NEPA permitting, FERC licensing and compliance, wetland delineation and mitigation, wildlife and vegetation surveys, and environmental permitting.</p>	<p>Terrestrial Zoology</p>
<p>Sam Waltman <i>B.S., Marine Biology, Texas A&M University</i></p>	<p>13 years in natural resource surveys and permitting, including EIS and EA preparation, field sampling, GIS analysis, USACE jurisdictional delineations, T&E species surveys, hydrogeomorphic assessments, NRDA, Phase 1 ESAs, and environmental compliance monitoring</p>	<p>Prime Farmland, Managed and Natural Areas, Recreation</p>
<p>Kimberly Sechrist <i>M.S., Environmental Science, Towson University</i> <i>B.S., Biology, McDaniel College (originally Western Maryland College)</i></p>	<p>Over 12 years of professional experience in the environmental consulting field. During this time, she has participated in a wide range of projects and tasks including on data validation, chemistry lab coordination and sample tracking, restoration, wetland delineation, endangered species studies and environmental sampling. She has authored numerous Land Use, Recreation, Visual, Socioeconomic, and Environmental Justice resource sections on a variety of third party EAs/EISs.</p>	<p>EA Project Manager QA/QC Purpose and Need, Air Quality and Climate Change, Other Environmental Documentation, Alternatives, Site Description, Permits, Licenses and Approvals, Best Management Practices and Mitigation Measures, Noise</p>

Name/Education	Experience	Project Role
Yosef Shirazi, Ph.D. <i>Ph.D., Marine Policy, University of Delaware</i> <i>M.S., Marine Science, University of North Carolina at Wilmington</i> <i>B.S., Biology, University of Maryland</i> <i>B.S., Environmental Science and Policy, University of Maryland</i>	11 years of experience in the fields of ecology and economics. He has performed extensive work implementing and interpreting surveys and survey results, valuing ecosystem services, and evaluating the socioeconomic impacts of infrastructure projects. His areas of technical knowledge include welfare economics, biophysical relationships in coastal environments, and regional economics modeling.	Socioeconomics and Environmental Justice
Brenton Jenkins, P.E. <i>B.S. Environmental Engineering, Louisiana State University</i>	9 years in environmental consulting for various private and public sector clients, including project management, engineering design, permitting, and assessments, primarily in the oil and gas sector.	Transportation

8.0 AGENCIES AND OTHERS CONSULTED

The following federal and state agencies and federally recognized Indian Tribes were consulted.

- Tennessee Historical Commission
- Absentee Shawnee Tribe of Indians of Oklahoma
- Cherokee Nation
- The Chickasaw Nation
- Eastern Shawnee Tribe of Oklahoma
- Jena Band of Choctaw Indians
- The Osage Nation
- The Quapaw Nation
- Shawnee Tribe
- United Keetoowah Band of Cherokee Indians in Oklahoma

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