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ECONOMIC DEVELOPMENT GRANT PROPOSAL FOR THE CANTERBURY SITE

ENVIRONMENTAL ASSESSMENT

Dickson County, Tennessee (Dickson)

Prepared by:

TENNESSEE VALLEY AUTHORITY

Knoxville, Tennessee

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Table of Contents

List of Tables

List of Figures

List of Attachments

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 the Industrial Development Board of Dickson County (the County) to assist with the development of the Canterbury Site in Dickson County, Tennessee. The area of TVA's Proposed Action (herein referred to as the Project Area) comprises approximately 28.4 acres of the total 55 acres of the Canterbury Site. The Canterbury Site is located north of the intersection of Sanker Road and Premdor Drive (also known as Adcock Cemetery Road), approximately 3.7 miles southeast of the City of Dickson, Tennessee (see Figure 1 below and Attachment 1, Figure 1-A). TVA funds would be used for the clearing of approximately 9.5 acres of trees, rough grading of 28.4 acres, removal of an existing gravel access road (estimated 1,670 linear feet), and construction of a new gravel access road (estimated 2,015 linear feet), herein referred to as the Proposed Action, as further detailed in Section 3.2 below.

The Project Area would be stabilized following the completion of grading activities with actions such as installation of erosion control blankets on the side slopes and permanent seeding on remaining disturbed areas. The Proposed Action is expected to require an eight-month duration and would require a small workforce that would most likely be assigned from a local contractor.

The proposed grant to the County would assist with grading improvements to put the Canterbury Site 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. A variety of industrial sites exists to the south and west of the Project Area, including the Jones Brothers Asphalt Plant, Masonite Door Corporation, the Lewis Lumber and Milling Company, and several manufacturing facilities. Target industries for the Canterbury Site include automotive suppliers, advanced manufacturers, food/beverage manufacturers, and medical equipment manufacturers. Pursuant to the National Environmental Policy Action (NEPA) and its implementing regulations 40 CFR Parts 1500 – 1508 and TVA's implementing regulations 18 CFR Part 1318, this Environmental Assessment (EA) evaluates the environmental impacts that would potentially result from TVA's Proposed Action. TVA's decision is whether or not to provide the requested funding to the County.

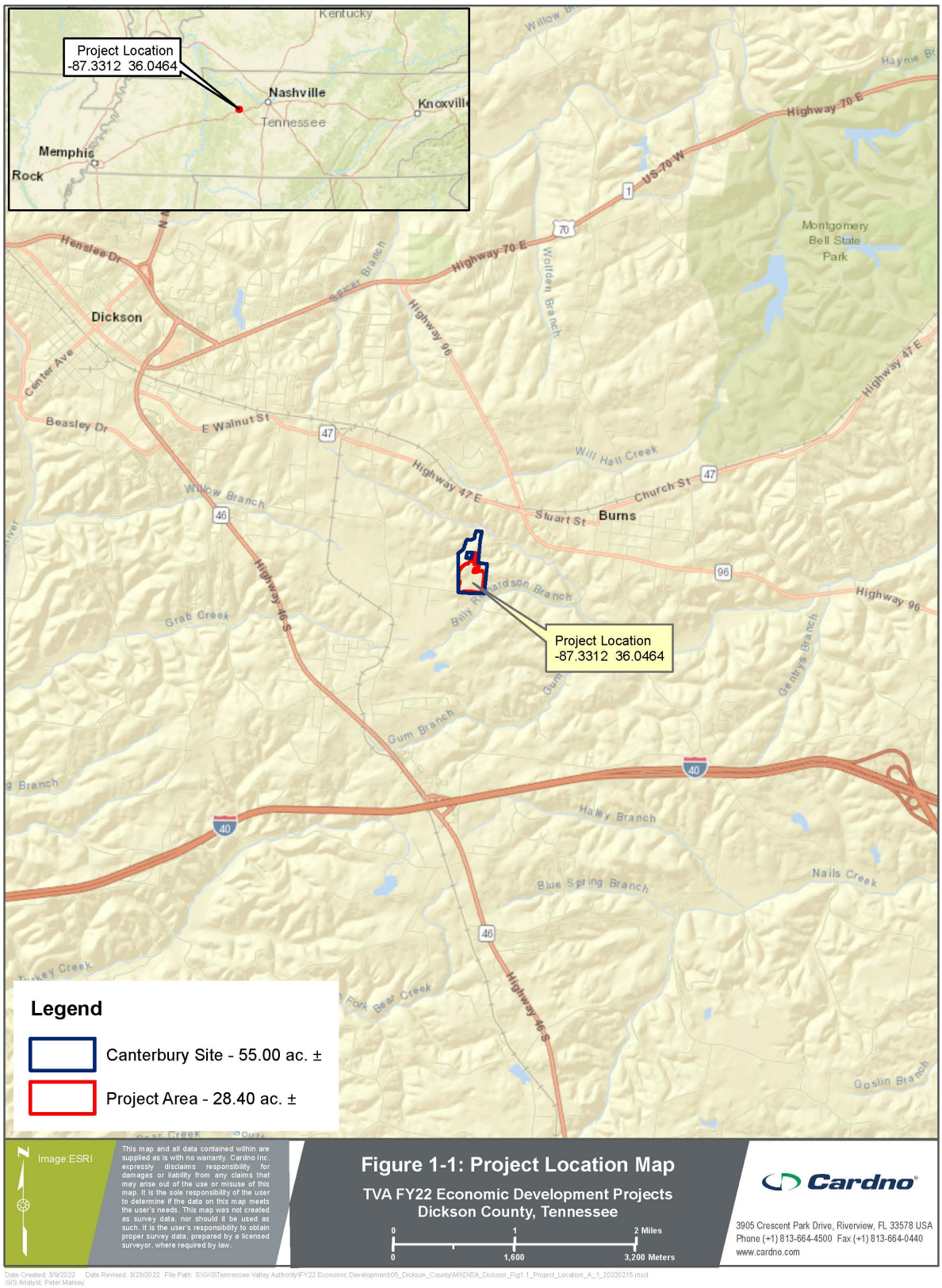

Figure 1. Project Location Map

2.0 OTHER ENVIRONMENTAL REVIEWS AND DOCUMENTATION

In preparation for site development, other studies have been performed by the County at the Canterbury Site. A Phase I Environmental Site Assessment (Phase I ESA) of the Canterbury Site 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 Terracon Consultants, Inc. (Terracon) in October 2019 (Terracon, 2019a). The purpose of the Phase I ESA was to identify the presence of recognized environmental conditions (REC) or other environmental liabilities within the Canterbury Site. Geotechnical studies of the Canterbury Site also were performed by Terracon in October 2019 (Terracon, 2019b). The purpose of the geotechnical study was to explore the general site and subsurface conditions within the Canterbury Site. EnviroScience, Inc. (EnviroScience) conducted an on-site wetland delineation and hydrologic determination in October 2019 (EnviroScience, 2019a) to identify wetlands and waterbodies, including those jurisdictional to the United States Army Corps of Engineers (USACE) and the Tennessee Department of Environment and Conservation (TDEC). EnviroScience also conducted a desktop review and limited on-site habitat assessment for state and federally listed threatened and endangered species in October 2019 (EnviroScience, 2019b). A Cultural Resources Desktop Review for the Canterbury Site was conducted by Terracon in October 2019 (Terracon 2019c). Midsouth Cultural Resource Consultants performed a Phase I Archeological Survey in March 2020 to determine if archaeological or cultural resources are present that may be eligible for the National Register of Historic Places (NRHP) and may be adversely impacted by future development (Midsouth, 2020).

The Phase I ESA, Geotechnical Studies Report, the Wetland and Other Waters Delineation Report, Threatened and Endangered Species Review, the Phase I Archeological Survey, and the Cultural Resources Desktop Review 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 National Environmental Policy Act (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 Alterative, TVA would provide InvestPrep funds to the County for improvements to the Project Area. These improvements would include the clearing of approximately 9.5 acres of trees, rough grading of 28.4 acres, removal of an existing gravel access road (estimated 1,670 linear feet), and construction of a new gravel access road (estimated 2,015 linear feet). Trees, including stumps, would be cut or removed and hauled off-site. Rough grading would require approximately 137,000 cubic yards of fill, which would be obtained on-site. No off-site borrow would be needed. The final crown elevation would be 846 feet above mean sea level (msl) (Attachment 1, Figure 1-B). Access to the public cemetery outside, but immediately adjacent to the Project Area, would be maintained. The existing gravel access road would be removed and a new re-routed gravel access road, proceeding north from Sanker Road along the western portion of the Project Area before curving northeast then north, would be constructed that would terminate adjacent to the cemetery.

The Project Area would be stabilized following the completion of grading activities with actions such as installation of erosion control blankets on the side slopes and permanent seeding on remaining disturbed areas. The proposed Project would be expected to require an eight-month duration and would require a small workforce that would most likely be assigned from a local contractor.

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

TVA's preferred alternative is the Action Alternative. 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 is beyond the scope of this EA.

4.0 AFFECTED ENVIRONMENT AND ANTICIPATED IMPACTS

4.1 Site Description

The 28.4-acre Project Area is located within the vacant, undeveloped 55-acre Canterbury Site in Dickson County, Tennessee north of the intersection of Sanker Road and Premdor Drive (also known as Adcock Cemetery Road), approximately 3.7 miles southeast of the City of Dickson, Tennessee. Access is provided from Sanker Road along the southern boundary of the Project Area (Attachment 1, Figure 1-A). The Project Area consists of forested areas, scattered trees and shrubs, and grassy open areas.

The majority of the Project Area consists of pasture with clumps of trees and wooded areas scattered throughout. A small number of trees were cleared from the Project Area by a local entity in 2020. A gravel road extends from Sanker Drive to a cul-de-sac, and then continues north to provide public access to the Adcock Family Cemetery. The Adcock Family Cemetery is located within the larger Canterbury Site but outside of the Project Area immediately to the northwest. A second gravel road branches off the primary gravel road and creates a loop around a clump of trees on the east side of the site. Utilities located adjacent to the Canterbury Site include a 12-inch water line, a 4-inch sewer force main and 8-inch gravity sewer line, overhead electric (TVA 161 kV transmission lines which cross the northern portion of the Project Area and 3-phase distribution lines), and a 4-inch natural gas line.

The Project Area is broadly situated within a residential and light industrial area of Dickson County, Tennessee and is zoned M-1: Light Industrial (City of Dickson Planning and Zoning 2022). Industrial neighbors include Jones Brothers Asphalt Plant, Masonite Door Corporation, the Lewis Lumber and Milling Company, Onward Manufacturing Company, and several manufacturing facilities.

The land use surrounding the Project Area consists of forest, residential, commercial, and light industry. The Project Area is bordered by undeveloped wooded habitat to the north and east and light industrial land use to the west and south. No permanent structures are present within the Project Area. According to field surveys conducted on the 55-acre Canterbury Site in 2019, three upland communities, open field, old field, and forest exist within the Project Area. In addition, land types within the Project Area identified in the Tennessee Real Estate Assessment Database include Pasture (54) and Woodland (62) as assessed using data derived from the Computer Assisted Appraisal System property assessment data maintained by the State of Tennessee's Comptroller of the Treasury (Tennessee 2022).

Elevations across the Project Area range from 842 feet to 849 feet from north to south and 858 feet to 819 feet from west to east feet above msl (Attachment 1, Figure 1-C). No floodplains occur within the Project Area (Attachment 1, Figure 1-D). No wetlands or surface waters were identified within the Project Area (Attachment 1, Figure 1-E).

4.2 Impacts Evaluated

Based on the Federal Emergency Management Agency (FEMA) flood insurance rate map for Dickson County, Tennessee (Attachment 1, Figure 1-D), (panel number 47043C0265C, effective

9/25/2009), the Project Area would be located outside identified 100-year floodplains. The hydrologic determination identified no perennial streams within the Project Area; therefore, the Proposed Action would be consistent with Executive Order (EO) 11988 and have no significant impact on floodplains and their natural and beneficial values.

An on-site wetland delineation and hydrologic determination was conducted on the entire 55-acre Canterbury Site by EnviroScience, Inc. in October 2019 (EnviroScience, 2019a). According to the Wetland and Other Waters Delineation Report, a wetland approximately 0.14 acre in size and comprised of a palustrine forested (PFO) wetland is located within the Canterbury Site, but is outside the Project Area.

One intermittent stream and nine ephemeral streams were also identified within the Canterbury Site and account for approximately 1,909 linear feet of additional waterway. A hydrologic determination classified all ephemeral streams as wet weather conveyances (WWCs). No open water or other aquatic resources were identified within the Canterbury Site (EnviroScience 2019a). All wetlands and nine of the 10 waterbodies identified occur outside of the 28.4-acre Project Area and therefore would not be impacted by the Action Alternative. One ephemeral waterbody/wet weather conveyance, S-8a, is approximately 133 linear feet long was identified within the Project Area (Attachment 1, Figure 1-F). This channel would be avoided during construction. Stormwater from the Project Area flows east into Billy Richardson Branch approximately 0.1 mile east of the Canterbury Site.

During the aforementioned Canterbury Site survey, one ephemeral/wet weather conveyance (WWC) was observed within the Project Area. Ephemeral WWC features only convey water in response to precipitation and do not provide conditions for aquatic life. A review of the TVA Regional Natural Heritage database (accessed December 2021) and the USFWS Information for Planning and Consultation (IPaC) database (USFWS 2022) accessed February 15, 2022) indicate that no federally endangered or threatened aquatic animals are currently known to occur within the 8-digit HUC Harpeth River watershed encompassing the Project Area or within 10 miles of the Project Area within Dickson County. There are, however, three State-listed species that are documented to occur either within Dickson County, within the Harpeth River watershed, or within 10 miles of the Project Area. These include the State-imperiled Small scale Darter (*Etheostoma microlepidum*), State-rare and uncommon Southern Cavefish (*Typhlichthys subterraneus*), and the State-endangered/critically imperiled Egg-mimic Darter (*Etheostoma pseudovulatum).* No suitable habitat for small scale darter, southern cave fish, or egg-mimic darter was observed within the Project Area during a 2019 field assessment (EnviroScience 2019a; EnviroScience 2019b). Therefore, there would be no effect of the Proposed Action on aquatic ecology or federally or state-listed threatened and endangered aquatic species.

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

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 United States Environmental Protection Agency (USEPA) NEPA Assist Tool (USEPA 2020) indicated there are two natural or managed areas located within three miles of the Project Area: the Montgomery Bell Designated State Natural Area (approximately 2 miles northeast of the Project Area) and the Chamberlain Property – Monarch Waystation and National Wildlife Federation-Certified Wildlife Habitat (approximately 2.5 miles southwest of the Project Area). Therefore, given the distance between these two areas and the Project Area, 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. Montgomery Bell State Park is located approximately four miles to the northeast of the Project Area. Given the substantial distance between the Project and the park, the Proposed Action is not expected to have any impact on use of this recreational area.

TVA has determined that the Proposed Action, subsequent to TVA's selection of the Action Alternative, would have no impact on floodplains, wetlands, aquatic ecology, land use, prime farmland, managed and natural areas, or recreation 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) by implementing the Action Alternative include solid and hazardous waste, air quality and climate change, groundwater, soil erosion and surface water, 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 Solid and Hazardous Waste

A Phase I ESA was conducted on the Canterbury Site by Terracon in October 2019. According to the Phase I ESA, no RECs or Controlled RECs (CREC) were identified in connection with the site. One Historic REC (HREC) was identified at the site, which consisted of on-site disposal and subsequent removal of metal plating sludge (Terracon, 2019a).

In the early 1970's, an automobile part manufacturer located in Dickson, Tennessee, disposed of metal plating sludge in a gully or gullies within the Canterbury Site. Based on the limited information available regarding the location of the disposal, the disposal site may overlap with the southeastern portion of the Project Area. The metal plating sludge contained high levels of chromium, lead, nickel, copper, and cyanide. The automobile part manufacturer was requested by TDEC-Division of Remediation (DOR) to clean up these dump sites under the State Remediation Program (SRP) and 918 tons of contaminated soil were removed from the site in 1986. After the removal, soil samples were collected and confirmed the waste was adequately removed. The TDEC-DOR issued a Record of Decision (ROD) letter dated January 15, 1992, that stated "…the remedial action at the…" "site was a cost-effective remedy and has provided adequate protection to the public health, welfare, and the environment".

Although site remediation has taken place, per the recommendations of the Phase I ESA, as well as the December 2019 TDEC-DOR review of Terracon's findings, if additional contaminated soil is encountered during site grading activities, the County, or its contractors, would be expected to

ensure that the contaminated soil would be managed, transported, and/or disposed of in compliance with all applicable federal, state and local laws, regulations and ordinances including, without limitation, those pertaining to environmental protection and occupational safety and in such a manner as to not create an unacceptable risk or threat to site workers and neighbors.

No demolition, offsite waste disposal activities, or construction waste activities are expected to be associated with the Action Alternative. Pursuant to the findings of the Phase I ESA, if additional contaminated soil is visually observed and potentially encountered during construction activities, it would be handled in compliance with all applicable federal, state, and local laws. The Action Alternative would therefore, not be expected to result in significant impacts from the creation or disposal of solid and hazardous wastes.

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, it would be expected that similar precautions would be used 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, then ground disturbances would not occur and there would be no impacts for solid and hazardous waste from the No Action Alternative.

4.2.2 Air Quality and Climate Change

Federal and state regulations protect ambient air quality. With authority granted by the Clean Air Act (CAA) 42 United States Code (USC) 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 CFR 50 for the following “criteria pollutants:” nitrogen dioxide (NO_2), carbon monoxide (CO), ozone, sulfur dioxide (SO_2), lead, particulate matter (PM) with an aerodynamic diameter equal to or less than 10 microns (PM_{10}), 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, 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.

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 (CO_2), methane, and nitrous oxide.

Air quality impacts associated with activities under the Action Alternative include emissions from fossil fuel-fired equipment and fugitive dust from ground disturbances. Fossil fuel-fired equipment are a source of combustion emissions, including nitrogen oxides (NOX), CO, VOCs, SO_2, PM_{10}, $PM_{2.5}$, 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 sulfur content in diesel fuel of 15 parts per million (ppm). Felled trees and removed stumps would be hauled off-site, not burned.

Fugitive dust is a source of respirable airborne PM, including PM_{10} 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. 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, air quality impacts would be minimal, temporary, and localized; 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 CO_2 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 CO_2 from the atmosphere. Although forests do release some CO_2 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 9.5 acres of land containing trees for the Action Alternative would result in a minor loss of carbon sequestration capacity in the area that is predominately open fields with some scattered forested land.

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 associated from equipment and ground disturbances would occur, resulting 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 and ground disturbances would not occur and there would be no impacts to air quality and climate change from the No Action Alternative.

4.2.3 Groundwater

The Project Area is located within the Interior Low Plateaus Province (USNPS 2017 and USGS 2021). The Low Plateaus Province extends south to Mississippi and north to Kentucky, southern Indiana and southern Illinois. The Interior Low Plateaus Province is characterized by Quaternary age gravel and sand deposits composing the surficial aquifer system and consolidated Paleozoic age limestone, dolomite and sandstone (USGS 1995).

In the west-central part of Tennessee, the principal aquifer in the Low Plateaus Province consists of Mississippian limestone that is gently dipping to flat with an overlying regolith of varying

thickness (USGS 1995). Water quality in the limestone aquifers of the Low Plateaus Province is characterized as hard, with dissolved solids concentrations of 100 to 400 milligrams per liter or less. Water flow in the Mississippian aquifers consists of the infiltration of precipitation into the water table and flows through the regolith via intergranular spaces. The flow regime in the underlying limestone consists of flow via areas of secondary permeability within the rocks caused by dissolution of the limestone by rainwater. Water in the Mississippian aquifers typically moves in a perpendicular direction to potentiometric surface contours, with local flow along bedding planes and fractures, which can be perpendicular to one another. Local flow is typically to streams that drain the area and springs. (USGS 1995).

Implementation of the Action Alternative would result in ground disturbance during construction activities. Tree clearing would result in minor ground disturbance at shallow depths, typically less than five feet. Rough site grading and removal of an existing gravel access road and construction of a new re-routed gravel access road would result in greater ground disturbance at shallow to moderate depths, typically less than 15 feet. Ground disturbances are not anticipated to be at depths that would interfere with public groundwater supply usage (thickness ranging from approximately 40 to 280 feet thick [USGS 2022]) or result in significant impacts to groundwater resources. This is supported by the geotechnical engineering investigation conducted on the 55-acre Canterbury Site to determine the subsurface conditions. The geotechnical analysis consisted of eight borings across the Canterbury Site. These borings identified the overburden at the Canterbury Site to consist mostly of clays and did not encounter any bedrock to depths of 35 feet below land surface (Terracon 2019b). Due to the presence of the clay unit just below land surface, any impact to the underlying aquifers would be minor from changes in overland water flow and recharge caused by clearing, grading, and gravel access road removal and gravel access road construction 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.

As stated above, a Phase I ESA was completed in October 2019 by Terracon Consultants, Inc., which indicated that an automobile part manufacturer disposed of metal plating sludge in a gully or gullies potentially within the Project Area in the 1970s and was required to clean up the site (see section 4.2.1). Given TDEC-DOR's conclusion that the site was adequately cleaned up and that public health and the environment were adequately protected, no impacts on groundwater are anticipated from the disposal site. It is also 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, grading, the removal of an existing gravel access road, and the construction of a new gravel access road, would not occur and there would be no impacts to groundwater resources.

4.2.4 Soil Erosion and Surface Water

The Project Area is in Dickson County, Tennessee in the Western Highland Rim ecoregion. This ecoregion is characterized by dissected, rolling terrain of open hills, with elevations of 400-1000 feet above msl. The geologic base of Mississippian-age limestone, chert, and shale is covered by soils that tend to be cherty, acid, and low to moderate in fertility. Streams are characterized by coarse chert gravel and sand substrates with areas of bedrock, moderate gradients, and relatively clear water. The Project Area drains to streams within the Beaverdam Creek watershed (Hydrologic Unit Code [HUC]-12: 051302040402).

Soil types and descriptions are from the Web Soil Survey (NRCS 2022) (Attachment 1, Figure 1-G). Soil types mapped within the Project Area include Sengtown gravelly silt loam (5-12 percent slopes) and Sengtown gravelly silt loam (30-60 percent slopes).

According to the preliminary subsurface geotechnical investigation that was conducted for the 55-acre Canterbury Site, surficial topsoil was noted that varied from one to nine inches thick. Beneath the topsoil, the borings typically encountered an upper soil layer consisting of brown, red, reddish yellow, and yellow brown lean clay with gray mottling with varying amounts of sand, organics, silt, black minerals, and chert (Terracon 2019b).

Soils in the Project Area would be disturbed by tree clearing and widespread grading. However, the Proposed Action includes the stabilization of disturbed soils as described in section 3.2. Further, BMPs would be required as part of the National Pollutant and Discharge Elimination System (NPDES) General Permit for Discharges Associated with Construction Activities (TNR100000) as described in more detail below. These factors would effectively avoid or minimize impacts on soils and from soil erosion.

Precipitation in the vicinity of the Project Area averages about 54 inches per year. The average monthly air temperature ranges from a high of 89 degrees Fahrenheit in July to a low of 30 degrees Fahrenheit in January (Weatherspark.com 2022). Stream flow varies with rainfall and averages approximately 2.86 cubic feet per second (cfs) within Beaverdam Creek located north of the Project Area (USEPA 2022a) and 1.31 cfs within Billy Richardson Branch located southeast of the Project Area (USEPA 2022b).

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.

Neither Beaverdam Creek nor Billy Richardson Branch is listed on Tennessee’s 303(d) list (TDEC 2022a) and are classified for fish and aquatic life, recreation, irrigation, and livestock watering and wildlife (TDEC 2019a).

As stated, in 2019 an on-site wetland delineation and hydrologic determination was conducted on the 55-acre Canterbury Site. One intermittent stream and nine ephemeral streams were identified within the Canterbury Site and account for approximately 1,909 linear feet of waterway (EnviroScience 2019a). Nine of the 10 waterbodies identified occur outside of the 28.4-acre Project Area and therefore would not be impacted by the Action Alternative. One WWC, S-8a would be located within the Project Area (Attachment 1, Figure 1-F), but would be avoided by the

Proposed Action. According to the EnviroScience report, S-8a is a 133-foot ephemeral stream/WWC that originates in the southcentral portion of the Canterbury Site and flows north alongside the gravel road and into a diked depression where a wetland is located just outside of the Project Area. S-8 is a tributary to Beaverdam Creek (EnviroScience 2019a). According to the report, S-8a would be under the jurisdiction of the USACE and/or TDEC.

Any alterations to streams, wetlands, or other waters may only be performed under a valid state-issued Aquatic Resource Alteration Permit (ARAP) as required. In addition, if the USACE determines that S-8a is federally jurisdictional, they should also be consulted prior to working in this area. Should impacts to the S-8a be required, the County, or its contractors, would be expected to obtain a State ARAP from TDEC and would also be expected to consult with the USACE as required and obtain all necessary Federal permits.

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. The County, or its contractors, would be required to obtain coverage under the 2021 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. 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. 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 would increase impervious flows in the Project Area. Under the required NPDES permit, all flows would need to be properly treated with either implementation of the proper BMPs or engineering 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 actions would not occur and there would be no impacts from soil erosion or to surface water resources.

4.2.5 Terrestrial Zoology

4.2.5.1 **Wildlife**

The Project Area is comprised of abandoned pastureland with some narrow tree lines (largely pine trees, cedar trees, and shrubs) and small fragments of forest that border the pastureland. The sections of forest fragments on the southern and western boundaries of the Project Area are mature forests largely of white oak (*Quercus alba*) species with an open forest floor and canopy. The forested fragment in the northeastern section of the Project Area consists mostly of cedars and dense shrubs and vines, creating a dense midstory. A small creek borders the western boundary, immediately outside of the Project Area. There is a man-made retention pond on the Canterbury Site, outside of the Project Area. The landscape in the surrounding area is a mix of forested lands and industrial development.

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 in the field during field surveys in January 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 January 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 mature forested fragments and tree lines along the existing fences comprised of pine 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 January 2022, the following avian species were observed using the tree lines and forested areas in the Project Area: American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), eastern bluebird, northern cardinal, sparrow species, turkey vulture (*Cathartes aura*), Carolina chickadee, white-breasted nuthatch (*Sitta carolinensis*), pileated woodpecker (*D. pileatus*), dark-eyed junco (*J. hyemalis*), and 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 Canterbury Site, 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, Cope's gray tree frog, eastern red-spotted newt, northern cricket frog, southern leopard frog, and upland chorus frog. Reptiles utilizing these wet areas and the surrounding habitat include garter, northern water, rat and ring-necked snakes (Powell et al. 2016, Gibbons and Dorcas 2005). Chorus frogs were observed calling during the field survey in January 2022.

One cave record is known within three miles of the Project Area, approximately 1.7 miles away. Caves were not observed during a field survey of the Project Area in January 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 January 2022. Review of the USFWS IPaC tool in September 2021 identified one migratory bird species of conservation concern (red-headed woodpecker) that could occur within the Project Area. 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).

Under the Action Alternative, TVA would provide matching funding to assist with the development of a portion of the Canterbury Site that includes the following proposed actions: tree clearing, rough grading/grubbing and the re-routing of an existing gravel access road. Approximately 9.5 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 Action.

The USFWS IPaC tool identified one migratory bird of conservation concern (red-headed woodpecker) that could occur within the Project Area. As noted above, 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 at the time of tree clearing. However, due to the relatively small amount of suitable habitat and the availability of suitable habitat adjacent to the Project Area, proposed actions are 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 to terrestrial animals and their habitats 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 actions would not occur and there would be no impacts to terrestrial animals and their habitats.

4.2.5.2 Threatened and Endangered Species

Review of the TVA Regional Natural Heritage Database in September 2021 resulted in records of two state species of conservation concern (osprey (*Pandion haliaetus*) and acuminate snaketail (*Ophiogomphus acuminatus*)) within three miles of the Project Area. Two federally listed species

(gray bat (*Myotis grisescens*) and northern long-eared bat (*Myotis septentrionalis)*) and one federally protected species (bald eagle (*Haliaeetus leucocephalus)*) are known from Dickson County, Tennessee, but not within three miles of the Project Area. Additionally, review of the USFWS IPaC tool identified one additional federally listed species (Indiana bat (*Myotis sodalist)*) and one candidate species (monarch butterfly (*Danaus plexippus)*) that could 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 Dickson County, Tennessee and other species of conservation concern documented within three miles of the Project Area[1]

Common Name	Scientific Name	Status[2]	
		Federal	State[3](Rank3)
Birds			
Bald eagle[4]	*Haliaeetus leucocephalus*	DM	D(S3)
Osprey	*Pandion haliaetus*	-	-(S3)
Invertebrates			
Monarch butterfly[5,6]	*Danaus plexippus*	C	-(S1)
Acuminate snaketail	*Ophiogomphus acuminatus*	-	-(S2)
Mammals			
Gray bat[4]	*Myotis grisescens*	E	E(S2)
Indiana bat[5]	*Myotis sodalis*	E	E(S1)
Northern long-eared bat[4]	*Myotis septentrionalis*	T	T(S1S2)

[1]Source: TVA Regional Natural Heritage Database, extracted 9/27/2021 and USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/), accessed 9/27/2021.

[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

[4]Species known from Dickson 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 Dickson County, Tennessee; USFWS has determined this species could occur within the project area.

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 Dickson County, Tennessee, approximately 19.9 miles from the Project Area. The Project Area consists largely of abandoned agricultural fields and small forested fragments. A small retention pond surrounded by trees and covered by tree canopy exists within the boundaries of the Canterbury Site, but outside of the Project Area. No bald eagles, nests, or foraging habitat were observed during field reviews of the Project Area.

Ospreys are medium-sized raptors that build nests in trees or structures (e.g. light posts) over or near water, foraging almost exclusively on fish from nearby waterbodies (NatureServe 2022, Poole 1989). Breeding season typically begins in March and lasts through July. Two osprey nests are known within three miles of the Project Area. The nearest nest is approximately two miles away. No osprey, osprey nests or foraging habitat were observed during a field site visit by a TVA terrestrial zoologist in January 2022.

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 field within the Project Area consists of some wildflower and other flowering plant species that provide suitable foraging. No 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 is not present in the region at the time field surveys were completed.

Acuminate snaketail is a dragonfly species known only from a few localities in Alabama, Tennessee, and Kentucky. The species requires clear high-quality streams with exposed bedrock (NatureServe 2022) and are negatively impacted by siltation and gravel removal of streams resulting from logging and agricultural activities. One record of an acuminate snaketail is known from a creek approximately 1.5 miles from the Project Area. A small clear creek that offers suitable habitat for the snaketail borders the western boundary of the Canterbury Site but is outside of the Project Area.

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 Dickson County, Tennessee, from a mist-net capture record approximately 6.6 miles from the Project Area. One cave is known within three miles of the Project Area, approximately 1.7 miles from the Project Area, and no caves were observed during field surveys. One pond that is within the Canterbury Site, but outside of the Project Area, offers additional 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 Dickson County, Tennessee. However, review of the USFWS IPaC tool, determined that this species could occur within the area.

The northern long-eared bat (NLEB) 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, NLEBs 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 NLEB is similar to that of Indiana bat, however, NLEB are thought to be more opportunistic in roost site selection. This species also roosts in abandoned buildings and under bridges. NLEB 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 four records of NLEB in Dickson County, Tennessee. The closest of these is a mist net capture approximately 7.4 miles away from the Project Area.

One cave is known within three miles of the Project Area approximately 1.7 miles away. 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 the trees (9.5 acres) proposed for removal do provide suitable habitat for summer roosting Indiana bat and NLEB. The areas of tree removal consist largely of suitable white oak trees that offer flakey bark or crevices, suitable for summer roosting. The forest edges along the field offer suitable forest edge foraging habitat. The adjacent retention pond offers additional foraging habitat.

Under the Action Alternative, TVA would provide matching funding to assist with the development the Project Area that includes tree clearing, rough grading/grubbing and the re-routing of an existing gravel access road. Approximately 9.5 acres of trees and shrubs would be cleared.

Due to the distance from known records to the Project Area (approximately 19.9 miles), no bald eagle nests would be impacted by the Proposed Action. Nesting and foraging habitat is not present within the Project Area and the Proposed Action is in compliance with the National Bald Eagle Management Guidelines. Bald eagles would not be significantly impacted by the proposed actions.

Similarly, due to the distance from known records to the Project Area (approximately 2.0 miles), no osprey nests would be impacted by the Proposed Action. Nesting and foraging habitat is not present within the Project Area. Osprey would not be significantly impacted by the Proposed Action.

Monarch butterfly foraging habitat exists throughout the Project Area. Milkweed plants were not observed during field surveys of the Project Area. Grading and road construction will impact monarch butterfly foraging 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. Significant 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 NLEB) have the potential to utilize the Project Area.

No caves or other hibernacula for gray bat, Indiana bat or NLEB exist in the Project Area or would be impacted by the Proposed Action. Approximately 9.5 acres 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 Indiana and northern long-eared bat. A pond exists within the boundary of the Canterbury Site, but outside of the APE, and no impacts to aquatic bat foraging habitat would be expected. To avoid direct impacts to Indiana bat and northern long-eared bat while they are birthing and rearing pups (June 1 – July 31), tree removal is proposed to begin in August 2022.

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 Action, including tree removal, 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 Action, distance to known bat records, and implementation of BMPs and conservation measures, significant impacts to gray bat, Indiana bat, and NLEB 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 to threatened and endangered terrestrial animals and their habitats 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 actions would not occur and there would be no impacts to threatened and endangered terrestrial animals and their habitats.

4.2.6 Botany

4.2.6.1 Vegetation

As stated above, the Project Area is located in the Western Highland Rim ecoregion. The oak-hickory natural vegetation of this ecoregion was mostly deforested in the mid to late 1800s, sometimes in conjunction with the iron-ore related mining and smelting of the mineral limonite, but now the region is again heavily forested. Some agriculture occurs on the flatter interfluves and in the stream and river valleys: mostly hay, pasture, and cattle, with some cultivation of corn and tobacco (USGS 2022).

Based on existing studies and a desktop review of past and current conditions, the Project Area consists mostly of vacant, undeveloped land and fields with some scattered trees. During 2019 field surveys, a field inspection of the site was then completed to identify major plant communities and to visually locate potential wetlands and waterbodies.

Four distinct vegetative communities were identified within the Canterbury Site, including one wetland community type. The majority of the 55-acre Canterbury Site exists as open field, and old field vegetation, forest, and one wetland. One intermittent stream, and nine ephemeral streams were also identified within the 55-acre Canterbury Site. Dominant species within both the tree and sapling stratum of the PFO include black willow (*Salix nigra*) and American sycamore (*Platanus occidentalis*). Although the wetland was mostly devoid of herbaceous vegetation, small amounts of rice cutgrass (*Leersia oryzoides*) and red maple seedlings (*Acer rubrum*) were present in the herbaceous stratum (EnviroScience 2019a). The land use surrounding the site consists of forest, residential, commercial, and light industry. As previously stated, the wetland would not be impacted by the Action Alternative.

Three upland communities, open field, old field, and forest exist within the site. Dominant species within the tree stratum of the upland forest community include tulip poplar (*Liriodendron tulipifera*), red maple, white oak (*Quercus alba*), black cherry (*Prunus serotina*), bitternut hickory (*Carya cordiformis*), American elm (*Ulmus americana*), and green ash (*Fraxinus pennsylvanica*). The sapling and shrub stratum consist of young trees, flowering dogwood (*Cornus florida*), eastern red cedar (*Juniperus virginiana*), and Amur honeysuckle (*Lonicera maackii*). The herbaceous layer of this community includes bitternut hickory seedlings, eastern poison ivy (*Toxicodendron radicans*), roundleaf greenbrier (*Smilax rotundifolia*), Allegheny blackberry (*Rubus allegheniensis*), and woodland strawberry (*Fragaria vesca*). Roundleaf greenbrier, eastern poison ivy, Japanese honeysuckle (*Lonicera japonica*), and an unknown species of grapevine (*Vitis* sp.) were observed within the woody wine stratum.

The Project Area is situated within a residential and light industrial area and is zoned for light industrial use. Based on a review of aerial photography, the majority of the Project Area also consists of vacant uplands comprising an open grassland/pasture and scattered clumps of forested habitat.

Herbaceous vegetation is characterized by greater than 75 percent cover of forbs and grasses and less than 25 percent cover of other types of vegetation. Mowed and bushhogged fields and old unmowed fields with thickets account for less than 19 acres of the vegetation in the Project Area. Most of these areas are dominated by plants indicative of early successional habitats and are comprised of mainly native and exotic, non-native vegetation. Common herbaceous species include beaked panic grass (*Panicum anceps*), broomsedge (*Andropogon virginicus*), daffodil (*Narcissus pseudonarcissus*), eastern blackberry (*Rubus pensilvanicus*), Japanese honeysuckle (*Lonicera japonica*), Japanese stiltgrass (*Microstegium vimineum*), nodding thistle (*Carduus nutans*), panic grass (*Dichanthelium* sp.), purpletop tridens (*Tridens flavus*), sericea lespedeza (*Lespedeza cuneata*), Small's ragwort (*Packera anonyma*), tall fescue (*Schedonorus arundinacea*), tall goldenrod (*Solidago altissima*), white avens (*Geum canadense*), and wild garlic (*Allium vineale*). Shrubs and young saplings blanketing old fields and thickets include winged sumac (*Rhus copallinum*) along with loblolly pine (*Pinus taeda*), southern red oak (*Quercus falcata*), and eastern red cedar (*Juniperus virginiana*).

Deciduous forests, stands where deciduous tree species account for more than 75 percent of the canopy cover, cover about 9 acres of the Project Area. A small section of the forested area within the project footprint is young and relatively disturbed, with trees averaging 2-6" diameter at breast height (dbh). The other forested areas are made up of mature trees averaging 12-18" dbh. Common canopy trees include American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), black oak (*Quercus velutina*), black walnut (*Juglans nigra*), cherrybark oak (*Q. pagoda*), chinkapin oak (*Q. muehlenbergii*), honey locust (*Gleditsia triacanthos*), mockernut hickory (*Carya tomentosa*), osage orange (*Maclura pomifera*), post oak (*Q. stellata*), red maple (*Acer rubrum*), slippery elm (*Ulmus rubra*), southern red oak, sugar maple (*Acer saccharum*), tulip poplar (*Liriodendron tulipifera*), white oak (*Q. alba*), and winged elm (*Ulmus alata*), along with scattered loblolly pine. The understory consists of Chinese privet (*Ligustrum sinense*), common elderberry (*Sambucus canadensis*), coralberry (*Symphoricarpos orbiculatus*), flowering dogwood (*Cornus florida*), multiflora rose (*Rosa multiflora*), and winged sumac. The herbaceous layer is somewhat sparse and includes plants like Christmas fern (*Polystichum acrostichoides*), goldenrod, and wild garlic along with the woody vines common periwinkle (*Vinca minor*), Japanese honeysuckle, poison ivy (*Toxicodendron radicans*), and roundleaf greenbrier (*Smilax rotundifolia*). Overall, none

of the proposed Project Area supports high quality plant communities with significant conservation value.

Implementation of the Action Alternative would not result in negative impacts to native vegetation on any appreciable scale. Adoption of this alternative would result in wholesale disturbance across at least 20 acres of the Project Area. The area would be graded and most of the vegetation would be removed. Impacts to vegetation may be permanent, but the vegetation found on site is comprised both of early successional plants and forested plants that have no 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 parcel would continue to be dominated by early successional species indicative of disturbed habitats transitioning to forests and mature forests still flourishing in the northern and southeastern sections of the 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 EA from outside sources, similar site activities would occur, resulting in similar impacts to vegetation 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 actions would not occur and there would be no impacts to vegetation.

4.2.6.2 Threatened and Endangered Species

A January 2022 query of the TVA Heritage database indicates that one state-listed and no federally listed plant species has been previously reported from within a five-mile vicinity of the proposed Project Area (Table 4-2). One federally endangered plant species, Lesquereux's Mustard, is known from Dickson County, Tennessee. Lesquereux's Mustard occurs in steep, rocky, wooded slopes and talus areas usually on south to west-facing slopes near rivers or streams (Federal Register 2019).

Table 4-2. Plant species of conservation concern previously reported from within five miles of the proposed Dickson InvestPrep project and federally listed plant species in Dickson County, Tennessee.[1]

Table 4.2 Plant Species of Conservation Concern Previously reported within Dickson County, TN1

Common Name	Scientific Name	Federal Status[2]	Tennessee State Status[2]	State Rank[3]
Plants				
Eggert's Sunflower	*Helianthus eggertii*	–	SPCO	S3
Lesquereux's Mustard[4]	*Physaria globosa*	END	END	S2

1 Source: TVA and Tennessee Natural Heritage Database, queried February 2022

2 Status Codes: SPCO = State Listed, no status assigned; THR = Listed Threatened

3 State Ranks: S2 = Imperiled; S3 = Vulnerable

4 Federally listed species occurring within Dickson County where work would occur, but not necessarily within 5 miles of the project area.

A field survey conducted in January 2022 indicates that no habitat for state or federally listed plant species occurs within the Project Area, the majority of which is highly disturbed and populated

primarily with native and non-native weedy species. Less common are mature forests. No designated critical habitat for plants occurs in the proposed Project Area.

Consultation by the County with TDEC Division of Natural Areas in 2019 concluded that the agency does not anticipate impacts to rare, threatened, or endangered species under their jurisdiction, as a result of the Proposed Action (TDEC 2019b).

Adoption of the Action Alternative would not negatively impact vegetation on any appreciable scale. Adoption of this alternative would result in wholesale disturbance across at least 20 acres of the Project Area. The area would be graded and most of the vegetation would be removed. Impacts to vegetation may be permanent, but the vegetation found on site is comprised both of early successional plants and forested plants that have no conservation value.

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 plant species of conservation concern 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 actions would not occur and there would be no impacts to plant species of conservation concern.

4.2.7 Archaeology and Historic Structures

Cultural resources include prehistoric and historic archaeological sites, districts, buildings, structures, and objects, as well as locations of important historic events that lack material evidence of those events. Cultural resources that are listed, or considered eligible for listing, on the National Register of Historic Places (NRHP) are called historic properties. Cultural resources become historic properties when they possess both integrity and significance. A historic property's integrity is based on its location, design, setting, materials, workmanship, feeling, and association. The significance is established when historic properties meet at least one of the following criteria: (a) are associated with important historical events that have made a significant contribution to the broad patterns of our history; (b) are associated with the lives of significant historic persons; (c) embody distinctive characteristics of a type, period, or method of construction or represent the work of a master or have high artistic value; or (d) have yielded or may yield information important in history or prehistory.

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of their proposed undertakings on historic properties and provide the Advisory Council on Historic Preservation an opportunity to comment on those effects. Section 106 of the NHPA also requires federal agencies to consult with the respective state historic preservation office when proposed federal actions could affect historic and cultural resources, including archaeological resources, which are also protected under the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act, in addition to the NHPA.

TVA does not anticipate visual effects from this project due to the ground-level nature of the proposed actions, surrounding heavy vegetation and intervening landforms. Additionally, modern 100-foot-tall transmission towers running through the project footprint and pre-existing industrial construction to the immediate south and west have compromised any potential for historic viewsheds. The transmission line segment that crosses the project footprint (L5207-5), was installed in 1999 and has a previous archaeological survey (Hazel 1998) (Figures 1-2). No

archaeological sites were reported by the survey. There is a more recent due diligence archaeological survey covering the entirety of TVA's Project Area that was undertaken in 2020 by Midsouth Cultural Resource Consultants. Midsouth's background research indicated that no previously recorded archaeological sites are known within TVA's APE. Midsouth conducted a Phase I archaeological survey on 54 acres that completely encompasses TVA's 28.4-acre Project Area in 2022. Three hundred eighty-eight shovel tests were excavated within the Project Area distributed across 43 transects. Three shovel tests produced positive results to include a wire nail, window glass and a whiteware fragment. The remains of a single structure that appears to be a barn or outbuilding was found that also appears on the USGS topographic map in the southeastern corner of the survey area. Midsouth has recommended and TVA concurs that the structure is not eligible for the NRHP due to loss of integrity. Midsouth recommends no further archaeological work within their 54-acre survey area.

Under the Action Alternative, TVA finds that the proposed undertaking would result in no effects to historic properties included in, or eligible for inclusion in, the NRHP. In a letter dated March 14, 2022, the Tennessee State Historic Preservation Office concurred with TVA's "no effect" finding. 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 Project Area is 28.4 acres consisting of small patches of wooded/forested areas and open land. The Project Area is bordered by forests and the Adcock Family Cemetery to the north, forests to the east, industrial/commercial areas to the south, and forests and industrial/commercial areas to the south and west. The visual landscape consists of rural development, including scattered agricultural properties and industrial development.

The Project Area would be directly adjacent to Sanker Road, approximately 0.6 mile east of County Highway 1845, and 0.5 mile southwest of Highway 96. The trees along Sanker Road, except for the intersection of Premdor Drive, (also known as Adcock Cemetery Road) serve as visual screening between the roadway and the Project Area. Approximately 85 feet of the intersection of Premdor Drive and Sanker Road would have direct line of sight to the Project Area. Residences occur sporadically within the proximity of the Project Area. Four residences are approximately 0.15 mile northeast and southwest of the Project Area, respectively. The residences in the area are surrounded by sporadic forested areas that may provide some visual screening between the residences and the Project Area.

The closest Scenic Byway is over 30 miles away. Therefore, no potential 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 Sanker Road would have direct views of the

Project Area. However, there are numerous other industrial 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 Sanker Road may notice a change in the viewshed due to tree removal, this change would be minor given the brief period that drivers would be in the area. The views from the industrial buildings south of the Project Area would experience a minor to moderate change. Current views from those areas would change from open land and scattered tree cover to developed industrial land. However, the distance of the 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 actions 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 actions 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 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 industry.

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. In addition, construction-related sound levels experienced by a noise sensitive 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 industrial buildings directly adjacent to the Project Area (the closest is about 300 feet west from the Project Area), residences immediately adjacent of the southwestern corner of the Project Area, and residences about 500 to 800 feet to the northeast. The noise 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 no impacts to noise receptors. 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 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 (Dickson), and locality (Dickson, Tennessee) (**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	Dickson County	Dickson, Tennessee
Population 1			
April 2020 Population	6,910,840	54,315	16,058
April 2010 Population	6,346,105	49,666	14,538
Population, Percent Change	8.9%	9.4%	10.5%
Population per Square Mile	153.9	101.4	728.6
White Alone, not Hispanic or Latino	73.5%	89.3%	83.0%
Black or African American Alone	17.1%	4.1%	7.6%
American Indian and Alaska Native Alone	0.5%	0.5%	0.1%
Asian Alone	2.0%	0.7%	0.8%
Native Hawaiian and Other Pacific Islander Alone	0.1%	0.1%	0.0%
Two or More Races	2.0%	2.0%	2.2%
Hispanic or Latino (of any race)	5.7%	3.9%	6.8%
Income[1]			
Median Household Income	$53,320	$53,076	$49,805
Per Capita Income	$29,859	$27,115	$27,082
Percent with Income Below the Poverty Level	13.6%	11.0%	16.7%

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

	Tennessee	Dickson County	Dickson, Tennessee
Employment (Not Seasonally Adjusted): October 2021[2]			
Labor Force	3,296,326	27,015	(Not Available)
Employed	3,186,080	26,246	(Not Available)
Unemployed	110,246	769	(Not Available)
Unemployment Rate (%)	3.3 %	2.8 %	(Not Available)
1 – Source: United States Census Bureau (2022) 2 – Source: United States Bureau of Labor Statistics (2022)			

The results of the evaluation of Environmental Justice consist of the following:

- Relative to the average Tennessee resident, the residents of Dickson County live at a lower population density but higher population growth. Relative to the average Tennessee resident, the residents of Dickson, Tennessee live at much greater population density and higher population growth.
- Relative to the average Tennessee resident, the residents of Dickson County are less likely to self-identify as a minority race or ethnicity. Relative to the average Tennessee resident, the residents of Dickson, Tennessee are less likely to self-identify as a minority race or ethnicity.
- Median household income and per capita income are both greater in Tennessee than in Dickson County and in Dickson, Tennessee. Residents of Dickson County are less likely to live below the poverty level than residents of Tennessee as a whole. Residents of the City of Dickson, Tennessee are more likely to live below the poverty level than residents of Tennessee as a whole.
- The unemployment rate in Dickson County is lower than the statewide unemployment rate in Tennessee.

During Project review, several residential subdivisions were identified within 0.5 mile of the Project Area, primarily to the northeast and to the northwest. EPA's EJScreen Tool identified 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 similar 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, rough grading, construction of a gravel access road, removal of an existing gravel access road, and soil stabilization measures including seeding and erosion control blankets. This effort is expected to take place over 8 months and would require a small workforce, likely drawn from a local contractor. 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 because of the Action Alternative. Positive indirect impacts may be noted through the increase in employment because of the Action Alternative.

There is minimal potential that the Action Alternative would result in a disproportionate and adverse impact on minority and low-income populations. This conclusion is based on two observations. First, the Action Alternative would have a minor positive effect on the local economy. Second, as described throughout this document, environmental effects associated with the Action Alternative would be minor and would generally be constrained to the 28.4-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 were 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 Sanker Road. The site entrances would be located on the southern side of the Project Area and construction of a new gravel access road off Sanker Road is part of the Proposed Action.

Sanker Road is a local road that provides access to industrial developments, rural properties, and approximately 3 residential properties east and west of the Project Area. Sanker Road is paved along its length, and is sufficiently wide for a single lane of traffic in each direction. Based on preliminary review of Google Streetview images (recorded July 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 Sanker 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. Sanker Road terminates to the west at County Highway 1845 (Old Columbia Road), transitions into Reliance Road to the east and terminates at industrial properties.

County Highway 1845 provides access to multiple commercial and residential properties to the north and south. Based on a review of Google Streetview images (recorded March 2021) the road is in good condition, has wide vegetated verges, and is sufficiently wide for one lane of traffic in each direction. County Highway 1845 is defined as a Major Collector by the Functional Classification System for Dickson County (Tennessee Department of Transportation [TDOT] 2019). Normal care would be taken by workers entering County Highway 1845 with regards to traffic safety. County Highway 1845 intersects Tennessee Highway 46 (Tennessee Highway 46) to the south, which is defined as a Principal Arterial (TDOT 2019). Tennessee Highway 46 provides access to Interstate 40.

There are no traffic count stations located on Sanker Road. It is anticipated that existing traffic volumes for these local roads would be low 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 County Highway 1845 and Tennessee Highway 46. 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 Area[1]

Route Description	Location ID	Distance from Project Area (Miles)	Year	AADT
County Highway 1845	22000150	1.9	2020	1,285
Tennessee Highway 46	22000093	2.0	2020	26,680
1 Source: Tennessee Department of Transportation (Annual Average Daily Traffic (AADT) (tn.gov)), extracted 1/14/2022.				

In the context of the existing AADT road volumes of these highways, the anticipated traffic generated by the proposed activities would be minor. 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 County Highway 1845 and Tennessee Highway 46.

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.

6.0 BEST MANAGEMENT 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 comply 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 NLEB. These measures 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
Kerry Nichols Ph.D. Anthropology, M.A. Anthropology, B.A. Political Science	21 years of experience as a field archaeologist and state historic preservation office project reviewer	Cultural resources, NHPA Section 106 compliance
Craig Phillips M.S., and B.S., Wildlife and Fisheries Science	15 years Sampling and Hydrologic Determinations for Streams and Wet-Weather Conveyances; 10 years in Environmental Reviews	Aquatic Ecology
Carrie Williamson, P.E., CFM B.S. and M.S., Civil Engineering	9 years in Floodplain and Flood Risk; 11 years in Compliance Monitoring; 3 years in River Forecasting	Floodplains QA/QC
Elizabeth Burton Hamrick M.S., Wildlife and Fisheries Science, University of Tennessee B.A., Biology, B.A., Anthropology, Grinnell College	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 M.S., Biology, Tennessee Technological University B.S., Wildlife and Fisheries Science, University of Tennessee	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

Name/Education	Experience	Project Role
Amanda Koonjebeharry, PMP B.S, Zoology and Botany, University of the West Indies	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 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	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 M.A., Anthropology, University of Arkansas B.A., Anthropology, Ohio University	27 years in archaeological consulting including management of projects across the southeast and mid-Atlantic regions. Principal Investigator for over 15 years.	Archaeology
Rachel Kennedy M.H.P., Historic Preservation, University of Kentucky B.A., Political Science and History, University of Kentucky	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 Code of Federal Regulations (CFR), Part 61.	Historic Structures and Sites

Name/Education	Experience	Project Role
Josh Yates, P.G. M.S., Geology, University of South Florida B.S. Natural Resources Management and Engineering, University of Connecticut	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.	Groundwater
Trey Fitzpatrick M.S., Environmental Management, Samford University B.S., Biology, Samford University	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.	Terrestrial Zoology
Sam Waltman B.S., Marine Biology, Texas A&M University	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.	Prime Farmland, Managed and Natural Areas, Recreation
Kimberly Sechrist M.S., Environmental Science, Towson University B.S., Biology, McDaniel College (originally Western Maryland College)	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.	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

Name/Education	Experience	Project Role
Yosef Shirazi, Ph.D. Ph.D., Marine Policy, University of Delaware M.S., Marine Science, University of North Carolina at Wilmington B.S., Biology, University of Maryland B.S., Environmental Science and Policy, University of Maryland	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. B.S. Environmental Engineering, Louisiana State University	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
- Coushatta Tribe of Louisiana
- Eastern Band of Cherokee Indians
- Eastern Shawnee Tribe of Oklahoma
- Kialegee Tribal Town, The Muscogee (Creek) Nation
- The Osage Nation
- Shawnee Tribe
- Thlopthlocco Tribal Town
- United Keetoowah Band of Cherokee Indians in Oklahoma

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