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# DRAFT
# ENVIRONMENTAL ASSESSMENT

# LATITUDE SOLAR CENTER PROJECT
**Hardeman County, Tennessee**

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

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# Symbols, Acronyms, and Abbreviations

| | |
|---|---|
| **AADT** | Annual Average Daily Traffic |
| **AC** | Alternating current |
| **APE** | Area of Potential Effects |
| **BEA** | Bolivar Electric Authority |
| **BMP** | Best management practice |
| **CCA** | Corrections Corporation of America |
| **CO** | Carbon monoxide |
| **dB** | Decibel |
| **dB(A)** | A-weighted decibel |
| **dbh** | Diameter at breast height |
| **DC** | Direct current |
| **DNL** | Day-night sound level |
| **EA** | Environmental Assessment |
| **EO** | Executive Order |
| **F-A-R** | Forestry-Agriculture-Recreation |
| **FPPA** | Farmland Protection Policy Act |
| **GHG** | Greenhouse gas |
| **IRP** | Integrated Resource Plan |
| **kV** | Kilovolts |
| **LSC** | Latitude Solar Center, LLC |
| **$\mu g/m^3$** | Micrograms per cubic meter |
| **MW** | Megawatt |
| **NAAQS** | National Ambient Air Quality Standards |
| **NEPA** | National Environmental Policy Act |
| **NHPA** | National Historic Preservation Act |
| **$NO_2$** | Nitrogen dioxide |
| **NPDES** | National Pollution Discharge Elimination System |
| **NRCS** | Natural Resources Conservation Service |
| **NRHP** | National Register of Historic Places |
| **NSL** | Non-Site Locality |
| **$PM_{10}$** | Particulate matter having a diameter of less than or equal to 10 microns |
| **$PM_{2.5}$** | Particulate matter having a diameter of less than or equal to 2.5 microns |
| **PPA** | Power purchase agreement |
| **ppb** | Parts per billion |
| **ppm** | Parts per million |
| **PV** | Photovoltaic |
| **ROW** | Right-of-way |
| **RSO** | Renewable Standard Offer |
| **$SO_2$** | Sulfur dioxide |
| **SWPPP** | Stormwater Pollution Prevention Plan |
| **TDOA** | Tennessee Division of Archaeology |
| **TVA** | Tennessee Valley Authority |
| **U.S.** | United States |
| **USACE** | U.S. Army Corps of Engineers |
| **USEPA** | U.S. Environmental Protection Agency |
| **USFWS** | U.S. Fish And Wildlife Service |

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# CHAPTER 1 – INTRODUCTION

The Tennessee Valley Authority (TVA) proposes to execute a power purchase agreement (PPA) with Latitude Solar Center (LSC), LLC, an affiliate of Coronal Development Services LLC, for electricity generated by LSC's proposed 20-megawatt (MW) direct current (DC) solar photovoltaic generating facility near the unincorporated community of Whiteville in Hardeman County, Tennessee (Figure 1-1). The proposed solar energy facility would occupy up to 135 acres of a 160-acre tract that LSC will lease for a 20-year period with two 5-year extension options from a private property owner. The proposed solar PV facility would be connected via a 1.9-mile 12.47-kilovolt (kV) overhead power line to the nearby Union Springs Substation, which is owned by Bolivar Electric Authority (BEA).

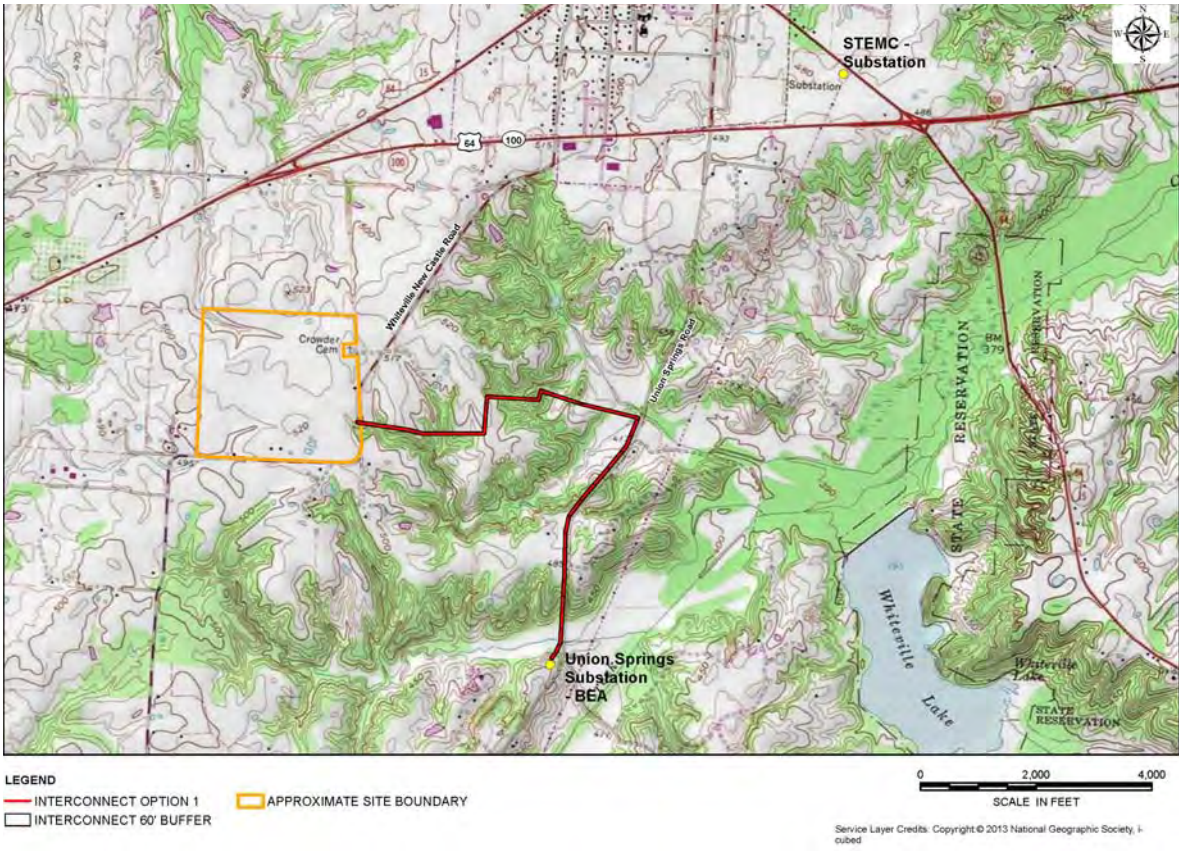


**Figure 1-1. Location for the proposed solar facility and interconnection power line route.**

## 1.1 Purpose and Need for Action

In its 2011 Integrated Resource Plan (IRP; TVA 2011) TVA established the goal of increasing its renewable energy generating capacity by 1,500 to 2,500 MW by 2020. TVA established the Renewable Standard Offer (RSO) program as one of the means of meeting this goal. Under the RSO program, TVA purchases energy at established terms and conditions (the "standard offer") from operators of qualifying renewable energy-generating facilities. Qualifying facilities must be new, located within the TVA service area, and must

generate electricity from specific technologies or fuels. Solar PV generation is one of the qualifying technologies. LSC has met the qualifications for the RSO program, and TVA must decide whether to execute the PPA.

TVA's 2015 IRP (TVA 2015) recommends the continued expansion of renewable energy-generating capacity, including the addition of between 175 and 800 MW of solar capacity within its jurisdiction by 2023. The proposed action would help meet this need for additional solar capacity.

## 1.2 Scoping and Public Involvement

The National Environmental Policy Act (NEPA) requires all federal agencies to consider the impact of their proposed actions on the environment before making decisions in compliance with regulations implementing NEPA promulgated by the Council on Environmental Quality (40 CFR Parts 1500 to 1508) and TVA procedures for implementing NEPA.

This Environmental Assessment (EA) has been prepared to assess the potential environmental impacts of the Proposed Action, which is described as TVA entering into the PPA with LSC and the associated construction and operation of the proposed solar facility by LSC.

Under the PPA, TVA's obligation to purchase renewable power is contingent upon the satisfactory conclusion of the environmental review and TVA's determination that the action will be "environmentally acceptable." In order to determine acceptability, the TVA must conclude that no significant direct, indirect, or cumulative impacts on the human environment would result from the location, operation, and/or maintenance of the proposed generating facility and that all project activities would be consistent with all applicable federal, state, and local environmental laws and regulations.

The following environmental resource areas are analyzed in this EA due to their potential for being impacted by the proposed action:

- Land Use and Zoning
- Socioeconomics
- Environmental Justice
- Visual Resources
- Cultural Resources
- Air Quality and Greenhouse Gas Emissions
- Noise
- Utilities
- Waste Management
- Transportation
- Geology and Soils
- Surface Water
- Wetlands
- Vegetation
- Wildlife
- Threatened and Endangered Species

TVA also considered potential effects related to groundwater, public and occupational health and safety, recreation, natural areas, and floodplains. However, TVA found these potential effects to be absent or minor and to not require further evaluation.

This draft EA is being issued for public review and comment. TVA will carefully review any comments received on this draft EA and address them, as appropriate, in the final EA.

## 1.3 Necessary Permits or Licenses

As discussed in Section 2.1.2, the current conceptual design proposed by LSC for the solar energy facility would not involve discharges to surface waters and would not be situated in wetlands or involve work in streambeds. Therefore, the construction of the solar energy system and electrical interconnection would not require an Aquatic Resource Alteration Permit/Section 401 Water Quality Certification or a United State Army Corps of Engineers (USACE) Section 404 Permit. The project would require clearing of upland forested areas, and TVA is consulting with the U. S. Fish and Wildlife Service (USFWS) on potential impacts to habitat for endangered and threatened bats. The proposed construction activities would require a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit, as more than one acre of the project site would be disturbed by construction activities such as clearing, grubbing, or grading. LSC will file the required site plan and building permit application with Hardeman County for Site Plan Administrative Review approval prior to the start of construction activities. The solar energy facility would be designed in accordance with all applicable standards in the National Electric Code.

# CHAPTER 2 - ALTERNATIVES

This chapter explains the rationale for selecting the alternatives to be evaluated, describes each alternative, provides a comparison of the potential environmental impacts of those alternatives, and identifies the preferred alternative.

## 2.1 Description of Alternatives

This EA evaluates two alternatives: the No Action Alternative and the Proposed Action Alternative.

### 2.1.1 Alternative A – The No Action Alternative

The No Action Alternative provides for a baseline of conditions against which the impacts of the Proposed Action Alternative can be measured. Under this alternative, TVA would not purchase the power generated by the project under the RSO PPA with LSC. In the absence of the PPA, LSC would not construct and operate the proposed solar facility and interconnection line. TVA would continue to rely on other sources of generation described in the 2015 IRP (TVA 2015) to ensure an adequate energy supply and to meet its goals for increased renewable and low-greenhouse gas (GHG) emitting power generation.

Environmental conditions in the project area would remain unchanged in the immediate future.

### 2.1.2 Alternative B – Proposed Action, Solar Array Options

Under the Proposed Action, TVA would enter into a PPA with LSC through the RSO program to purchase the electricity generated from the proposed solar energy facility for a 20-year period. LSC would construct, operate and maintain a 20-MW DC PV solar power generation facility on a 160-acre privately-owned land tract located near the Town of Whiteville in northwest Hardeman County, Tennessee. The proposed solar array and associated improvements (e.g., access roads, fence) would occupy approximately 135 acres of the 160-acre property, as either a single axis tracking system (Option 1 as shown on Figures 2-1 ), or a fixed tilt array system (Option 2 as shown on Figures 2-2). In addition, a laydown area (approximately 5 acres) would be within the 135 acre area. The 135 acres of land (hereafter referred to as the “development area”) would be cleared and graded as necessary during construction. The clearing and grading would not disturb the streams or the adjacent wetlands. The solar farm perimeter would be surrounded by opaque or semi-opaque, chain-link security fencing, with slats of earth tone colors to at least 6 feet in height with at least three strands of barbed wire.

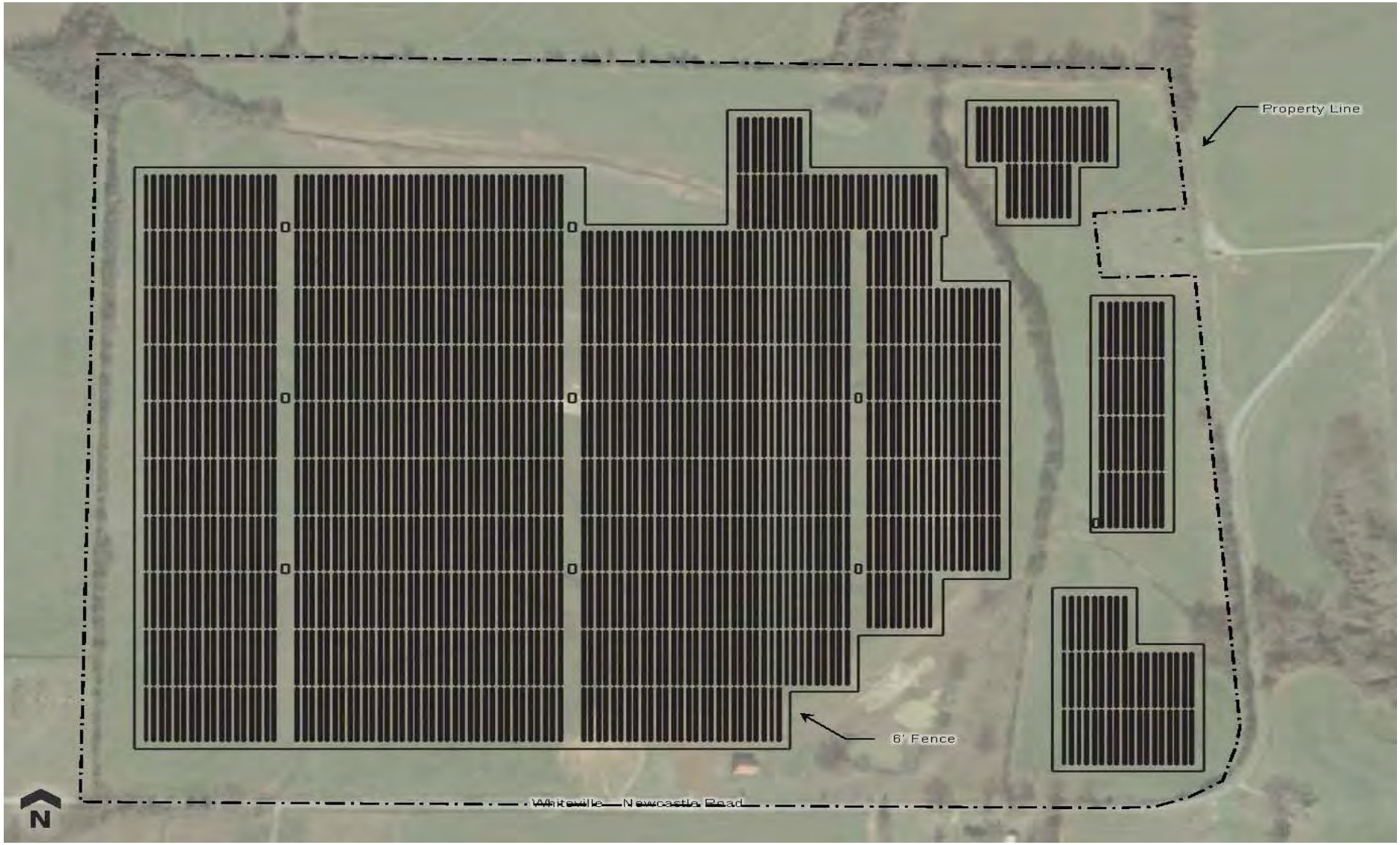


**Figure 2-1. Latitude Solar Center conceptual site layout – Option 1, single-axis tracking system.**

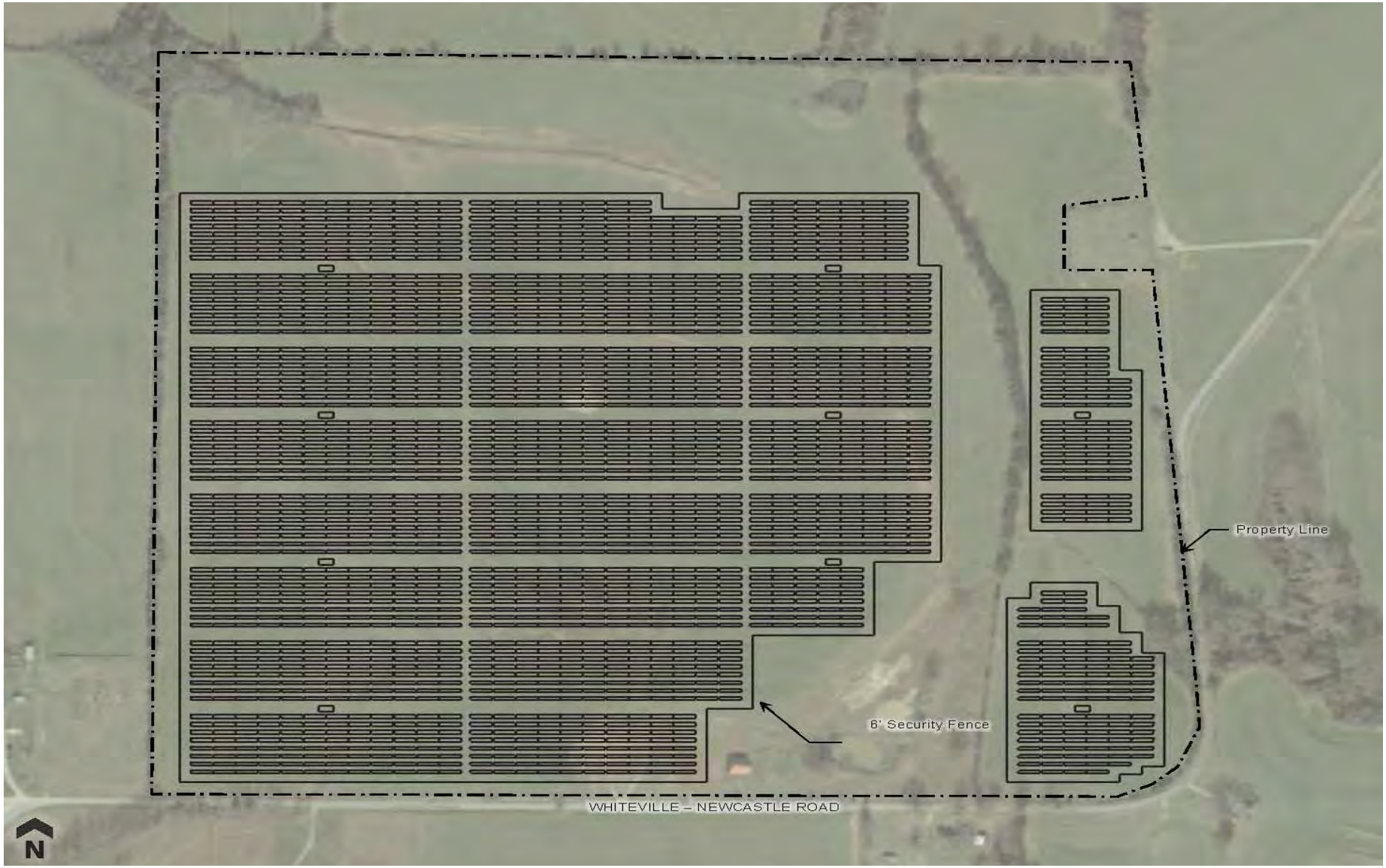


**Figure 2-2. Latitude Solar Center conceptual site plan – Option 2, fixed tilt system.**

The Option1 single axis tracker design would have the PV panels mounted on metal racks arranged in north-south rows (Figure 2-1). Electric motors attached to the panels mounts pivot the panels along the north-south axis (Figure 2-3) to track the movement of the sun, from facing east in the morning to facing west in the evening. The Option 2 fixed tilt design would have the PV panels mounted on racks arranged in east-west rows (Figure 2-2) and facing south at a fixed angle (Figure 2-4). The single axis tracker collects solar energy more efficiently than traditional fixed tilt racking systems, which results in higher energy generation per square foot. Under both options, the maximum height of the panels is about 10 feet above ground. For Option 1, this height is reached when the panels are at their maximum tilt angle; at other times their height would be less.

**Figure 2-3. Example of single-axis tracking photovoltaic array.**

Both Options would be secured using a series of prefabricated posts, racks, and other hardware. The post would be driven into the ground to a typical depth of 8 to10 feet, depending on local soil and wind conditions. These support structures are typically piles or metal posts that would be driven into the ground by either specialized pile drivers or drilled augers depending on future geotechnical analyses. No night lighting or security lighting would be installed; however, lights would be located within each inverter station cabinet for use when opened for inspections and routine maintenance.

**Figure 2-4. Example of fixed tilt photovoltaic array.**

Construction of the proposed solar facility consists of the clearing of approximately 135 acres of agricultural fields, trenching or horizontal direct drilling of electrical conduit, driving posts, assembling the racking to the posts, attaching the solar panels to the racking, and pouring concrete pads for inverters and switchgear. Trenches (typically 2 to 3 feet deep) would be dug for connecting DC wiring from the arrays to up to nine inverter stations. All trenches would be backfilled to surrounding grade. Each DC to alternating current (AC) inverter, along with a transformer, would be mounted on a concrete equipment pad. AC wiring installed in trenches would connect the transformers to pad-mounted switchgear located within the fenceline of the facility. From the switchgear, the electrical interconnection line would exit the site and head east to the BEA-owned Union Springs Substation.

Standard practice is to work with the slope of the land and minimize grading work to the maximum extent possible. Any required grading would be limited to the 135-acre project area within the fence line of the solar energy facility (including lay down areas, roadways, inverter pads, switchgear pad, and other components).

Grading would be performed with portable earth-moving equipment and would result in a slope consistent with that of the existing grades. No soils would be disposed of off-site from the grading activities, and any soil imported would likely be limited to clean sand that would be used for foundations and/or trenching.

The project area is currently being farmed. This area would be mowed or harvested as needed during construction and then would be naturally revegetated with grass or other

low-growing vegetation, as only minimal vegetation clearing is proposed for this action. No trees would be cleared nor wetlands or streams graded during the construction of the solar facility. LSC would construct a gravel access road from Whiteville-Newcastle Road into the project site. A 6-foot-high security fence, topped with three strands of barbed wire and equipped with a gate, would be installed surrounding the solar array system. As part of the zoning approval for the proposed solar power generation facility, LSC will plant a buffer of trees along select boundaries of the project site, outside the security fence. LSC would be responsible for maintaining the tree buffer (see Section 3.1 for more information).

There would be no major physical disturbance during the operation of the proposed solar facility. Routine maintenance, such as fence repair, vegetation management (e.g., mowing), and other periodic routine solar array operation and maintenance activities, would also periodically occur within the project site. Tree maintenance may be required in order to maintain solar performance in accordance with contractual obligations. Following completion of construction activities, the remaining 25 acres of the project site that is outside of the proposed perimeter fence would continue to be managed by the existing property owner.

It is anticipated that the following types of equipment would be used during construction activities:

- Backhoe(s)
- Flatbed semi-truck(s)
- Semi-truck(s)
- Forklift(s)
- Bobcats and/or specialized tractors with extender or drill with auger or pile driver for installation of array support posts
- Concrete truck.

A new 1.9-mile, 12.47-kV overhead power line would be constructed to connect the proposed solar energy facility to TVA's grid via an interconnection point within the BEA Union Springs Substation located southeast of the solar facility (Figures 1-1, 2-5). The power line would leave the solar facility site from the southeast corner, running along the southern boundary of adjacent private land, the northern and eastern perimeters of the Corrections Corporation of America's (CCA's) Whiteville Correctional Facility, and the west side of Union Springs Road. The new power line would be constructed within a right-of-way (ROW) approximately 60 feet wide, and portions of it would overlap an existing utility ROW. To facilitate construction and maintenance and the safe operation of the line, trees and other tall vegetation would be removed from the ROW. The power line, consisting of three conductors, would be strung on new utility poles approximately 30 feet tall and spaced at intervals of 150 feet in order to deliver the generated power from the solar energy system to the BEA substation. BEA would perform minor upgrades to the substation necessary to handle the additional electric load, and these upgrades would be contained within the substation site.


**Figure 2-5. Route of proposed interconnection power line from the solar facility (in upper left) to BEA substation (in lower right).**

There would be no major physical disturbance during the operation of the proposed solar facility. Routine maintenance, such as fence repair, vegetation management, and other periodic routine solar array operation and maintenance activities, would also periodically occur within the project site. The remaining 25 acres of the property that is outside of the proposed project site would continue to be managed by the existing property owner. As of the date of this report, the property owner will continue to use this area for agricultural purposes.

### 2.1.3 Alternatives Considered but Eliminated From Further Discussion

Siting requirements for a 20-MW solar energy facility include a contiguous area of at least 100 acres that is relatively level, proximity to an existing transmission line and/or substation capable of receiving the energy generated by the facility, and an adequate solar resource (i.e., adequate sunshine). Additional siting criteria include one or few landowners, a properly zoned site, and adjacent landowners that are receptive to the proposed development. LSC and its other financial stakeholders have investigated several sites in the surrounding region of western Tennessee. The proposed site has been selected and prioritized over the other sites based on proximity to a substation that can accept the modeled electric load from the proposed solar energy facility, the willingness of the private landowner to enter into a lease agreement with LSC, and the acceptance of the proposed facility by surrounding property owners and the authorities having local jurisdiction.

In addition to the aforementioned overhead interconnection line route, one additional line route was considered that would run northeast to Highway 100 along Whiteville-Newcastle

Road, east along Highway 100, and then south along Union Springs Road (Figure 2-6). This 3.5-mile route was eliminated from further consideration because it would cross property owned by numerous landowners, some who were unwilling to grant the necessary easements, and was less acceptable to BEA.

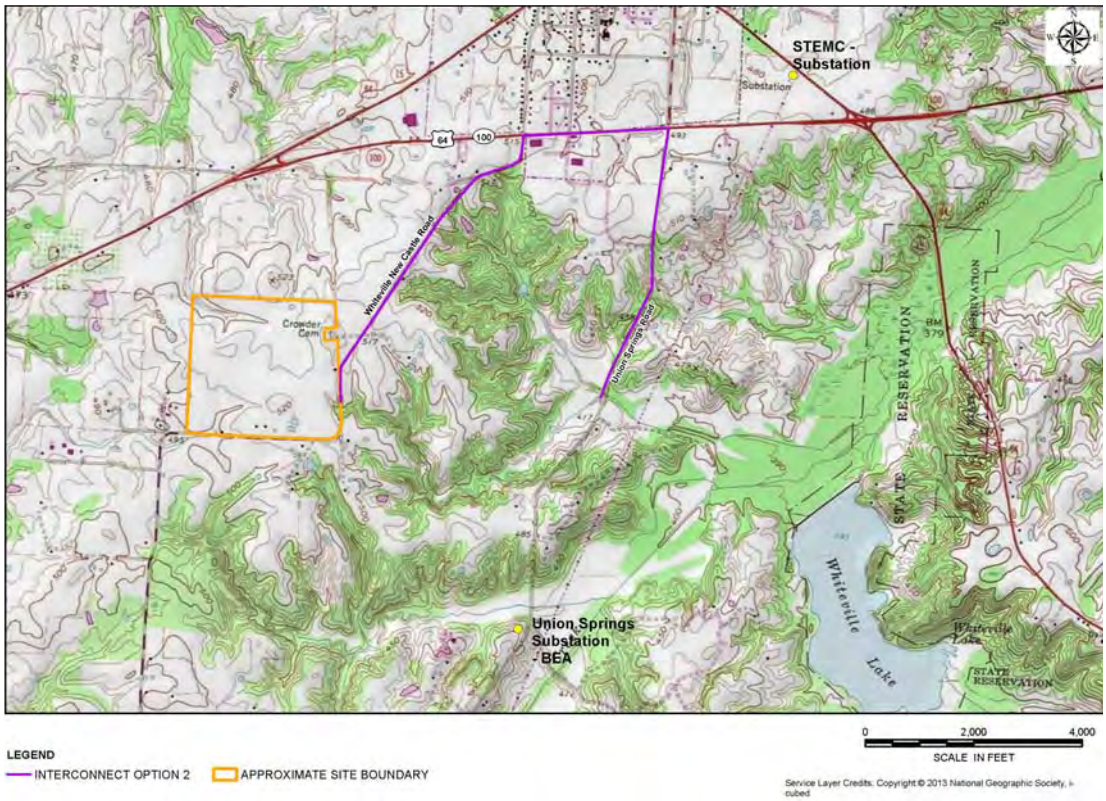


**Figure 2-6. Alternative interconnection power line route.**

## 2.2 Comparison of Alternatives

The summary and comparison of impacts by alternative for each resource area evaluated is provided in Table 2-1.

**Table 2-1. Summary and comparison of alternatives by resource area.**

| Resource Area | Impacts From No Action Alternative | Impacts From Proposed Action Alternative |
|---|---|---|
| Land Use and Zoning | No impacts anticipated | Minor direct, indirect, and cumulative adverse impacts. Land use of the site would change from agricultural to light industrial, with the surrounding area usage not changing. A relatively small portion of a large area land use category would be lost to a new use type. |
| Socioeconomics | No impacts anticipated | Minor beneficial direct, indirect, and cumulative impacts during construction and operation and maintenance activities by creation of local jobs and an increase in local tax base from an increase in assessed property value. |

| Resource Area | Impacts From No Action Alternative | Impacts From Proposed Action Alternative |
|---|---|---|
| Environmental Justice | No impacts anticipated | No direct or indirect impacts anticipated for either the solar PV system or the interconnection. |
| Visual Resources | No impacts anticipated | Minor direct, indirect, and cumulative adverse impacts. The security fence and solar panels would be visible from points adjacent to the site. The new interconnection line would be completed through woodlands and only visible from remote areas. |
| Cultural Resources | No impacts anticipated | No direct, indirect, or cumulative impacts are anticipated. |
| Air Quality & Greenhouse Gas Emissions | No impacts anticipated | Negligible temporary direct impacts would occur during construction activities. Minor long-term beneficial impacts would result from reduction in emissions of air pollutants and greenhouse gases by TVA power system. |
| Noise | No impacts anticipated | Negligible temporary direct impacts would occur during construction activities for either solar the PV system or the interconnection. No direct, indirect, or cumulative impacts are anticipated during system operations. |
| Utilities | No impacts anticipated | Potential brief interruption of local electrical service during construction of interconnection power line. Minor beneficial impacts to electrical supply in the area due to additional renewable energy resource supply. |
| Waste Management | No impacts anticipated | Minor direct, indirect, and cumulative adverse impacts during construction. Construction waste generated during construction activities would be recycled or directed to local landfills. Impacts during system operation would be negligible. |
| Transportation | No impacts anticipated | Minor direct and indirect temporary adverse impacts associated with construction activities for the solar PV system or the interconnection line. No cumulative impacts. |
| Geology and Soils | No impacts anticipated | No direct, indirect, or cumulative geologic impacts anticipated for either the solar PV system or the interconnection. Minor impacts to prime farmland. |
| Surface Water | No impacts anticipated | Minor, temporary, direct, and indirect adverse impacts during construction with small, beneficial, long-term impacts to surface water during operation of the solar energy system. |
| Wetlands | No impacts anticipated | No direct or indirect impacts anticipated for either solar PV systems or interconnection line. |
| Vegetation | No impacts anticipated | Minor direct and no indirect or cumulative impacts associated with the clearing of 6.4 acres of forest along interconnection line route. No adverse impacts anticipated from the conversion of the solar facility site from cropland to permanent grassland.. |

| Resource Area | Impacts From No Action Alternative | Impacts From Proposed Action Alternative |
|---|---|---|
| Wildlife | No impacts anticipated | Minor direct and no indirect or cumulative impacts associated with the clearing and grading of 135 acres of agricultural land and clearing of 6.4 acres of forested land. |
| Threatened & Endangered Species | No impacts anticipated | Direct, indirect, and cumulative impacts associated with the clearing of 6.4 acres of potential forested bat habitat. |

## 2.3 The Preferred Alternative

The Preferred Alternative is the Proposed Action Alternative with the Option 1 the single axis tracker solar facility and associated interconnection line route. This would fulfill TVA's purpose and need for increasing its renewable energy generating capacity with minimal adverse environmental impacts.

# CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the nature, extent, and importance of environmental resources in their existing setting on the project site. It provides a baseline for the assessment of potential effects of the alternatives described in Chapter 2. The scope of environmental consequences evaluated in this EA for the Proposed Action focuses on direct, indirect, and cumulative impacts resulting from the construction and operation of the proposed solar energy facility and interconnection power line.

The CEQ defines a cumulative impact as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually insignificant but collectively significant actions taking place over a period of time (40 CFR § 1508.7). The cumulative impacts analysis recognizes the effects of the proposed alternatives on the various resources. It also recognizes the effects of other past, present, and reasonably foreseeable future actions, and it describes the additive or cumulative effects that might result. Although some cumulative effects, however minimal, could be identified for virtually any resource or condition, the effects described in this document are believed to be the most pertinent and most representative of those associated with the proposed action. The cumulative impacts associated with the proposed action are described in detail in the individual resource sections in Chapter 3.

According to the Federal Emergency Management Agency Flood Insurance Rate Map 47069C0125C, the project area and proposed interconnection line route are designated as Zone X (unshaded), meaning they are located outside the 100- and 500-year floodplains, and there is a minimal risk of flooding. Therefore, there would be no direct, indirect, or cumulative floodplain impacts under the Proposed Action Alternative, and the Proposed Action would comply with Executive Order (EO) 11988 – Floodplain Management. The elements of the Proposed Action Alternative are not located within or less than 5 miles from areas designated as a natural area, open space, park, or wildlife management area or refuge.

## 3.1 Land Use and Zoning

This section provides an overview and details of the existing land use at and surrounding the project site, as well as the potential impacts on land use that would be associated with the alternatives.

### 3.1.1 Affected Environment

The term “land use” can be characterized as the way in which land has been developed and used in the agricultural, residential, and industrial landscapes. The project site is located in Hardeman County, which has developed a county-wide zoning ordinance in order to control the direction of development and to keep similar land uses together. The project site is currently used for agricultural purposes and contains open fields with two intermittent streams and a few small forested areas, mostly on its perimeter.

The project site is located in the Forestry-Agriculture-Recreational (F-A-R) Zoning District, which allows public and semi-public uses subject to approval by the Hardeman County Planning Commission. In August 2015, an amendment to the Hardeman County Zoning

Code was adopted to allow solar farms within F-A-R Zoning Districts. This amendment added definitions for “solar farm” and “solar collector” to the zoning text that further describe the elements of this proposed project development. In addition, Chapter 5 of the Zoning Code, Provisions Governing F-A-R Districts was amended to include solar farms as a ‘Use Permitted on Appeal.’

Land use in the area surrounding the project site is similar to that of the project site. According to the Hardeman County online Property Search Application, a majority of the surrounding zoning designations are agricultural with scattered single-family residential classifications adjacent to the south and one religious classification (Crowder Cemetery) to the east of the project site. In the surrounding areas, including the area that would contain the interconnection line, classifications also include commercial zoning (see Figure 3-1).

### 3.1.2 Environmental Consequences

#### *3.1.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, the proposed solar energy facility would not be constructed. Therefore, no project-related impacts to land use would be anticipated. Existing land use would be expected to remain under current agricultural usage. Existing land use in the surrounding areas would be expected to remain a mix of agricultural, forest, residential, commercial, and religious (the Crowder Cemetery) land.

#### *3.1.2.2 Alternative B – Proposed Action Alternative*

Minor direct, indirect, and cumulative land use impacts would be expected with the Proposed Action Alternative. Under the Proposed Action Alternative, land use at the project site would change from agricultural to light industrial with the installation of the solar energy facility. The forested land within the ROW of the proposed interconnection line would be cleared and maintained as grassland and shrubland. The construction and operation of this line would be compatible with current zoning. The adjacent and surrounding land uses would remain the same and would generally be unaffected by the change in land use at the project site.

Through the amendment of the zoning text, use as a solar farm is permitted upon appeal within the F-A-R Zoning District. On September 8, 2015, the Hardeman County Planning Commission approved LSC’s permit on appeal with the following requirements:

- Security fencing – opaque or semi-opaque fence (chain-link, inclusive of slats) of earth tone colors will be installed around the solar farm perimeter to at least 6 feet in height with at least three strands of barbed wire.
- Gates and Locks – all gates to fences will be installed to at least 6 feet in height with three strands of barbed wire. The gates will remain locked at all times, except when the owner/operator/agent is using the gate for ingress and egress.
- Setbacks – the solar farm setback will be at least 100 feet from all property lines of the parcel and 100 feet from any public road. The solar farm will also be at least 100 feet from the stream banks of any navigable stream.
- Interconnection ROW- use of the proposed interconnection route through private land and in the F-A-R Zoning district.

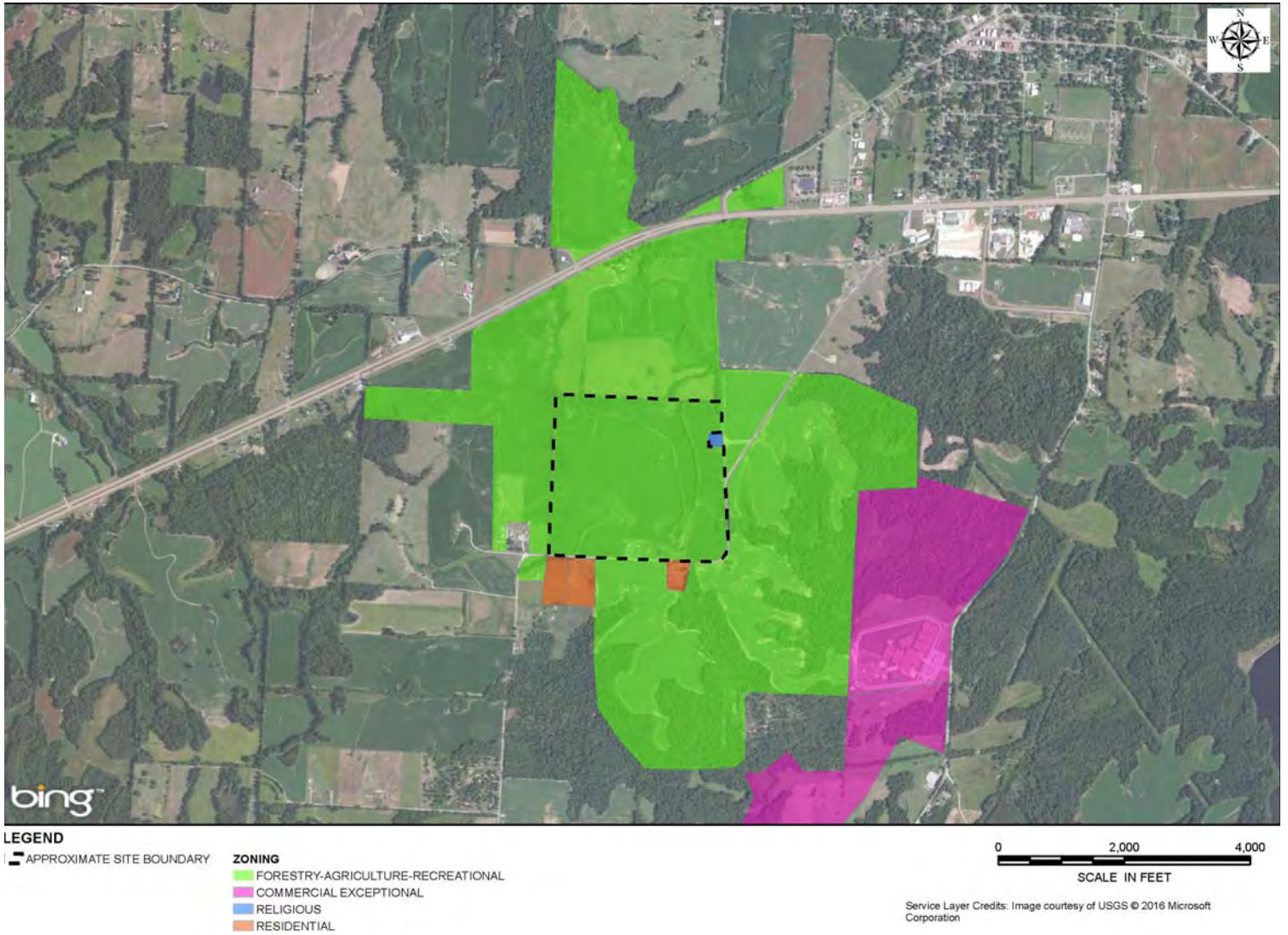


**Figure 3-1. Current zoning in the project area.**

- Evergreen vegetative buffer – an evergreen vegetative buffer, as required at the discretion of the Hardeman County Planning Director, will be present and maintained at all times around the perimeter of the exterior of the fencing and gates required around the perimeter of all solar farms. The evergreen vegetative buffer will be composed of evergreen trees or shrubs of a type which at planting will be a minimum of 4 feet in height and which will be maintained at a maturity height of not less than 6 feet. The evergreen trees or shrubs must be spaced no more than 10 feet apart and failure to maintain the evergreen vegetative buffer will constitute a violation of the permit on appeal. LSC will meet the Hardeman County Planning Director on site prior to commencement of construction to determine final vegetative screening requirements (including tree species) (Hardeman County 2015).

There are no known large developments, including other solar facilities, proposed in the surrounding area. The construction and operation of the proposed solar facility is unlikely to result in changes in land uses in the surrounding area; therefore, any cumulative impacts on land use would be minimal.

## 3.2 Socioeconomics

### 3.2.1 Affected Environment

The proposed project is located near the incorporated community of Whiteville, Tennessee in northwestern Hardeman County, approximately 60 miles northeast of Memphis. Hardeman County is identified as the area of impact with regard to socioeconomics.

**Socioeconomic Environment**

The population of Hardeman County, as reported by the United States Census in 2010, was 27,253 (U.S. Census Bureau 2015). The estimated 2014 Hardeman County population is 25,965. Census tract 9502, which contains the project site, has a population of approximately 6,194. In addition to the CCA Hardeman Correctional Facility and the CCA Whiteville Correctional Facility, the nearby Town of Whiteville has numerous retail and service businesses, motels, a bakery and other businesses operated by members of the large Mennonite Community and several manufacturers. Whiteville plays an integral role in the economic development and growth of Hardeman County (Hardeman County 2015).

According to the State of Tennessee Labor Force Estimates (State of Tennessee 2015), the labor force in Hardeman County in December 2015 was 9,450 and the unemployment was 690 jobs with an unemployment rate in December 2015 of 7.3 percent. According to the United States Department of Labor, Bureau of Labor Statistics, the 12-month net change in unemployment from December 2014 to December 2015 for Hardeman County showed a 1.4 percent decrease in unemployment. By comparison, the unemployment rate for the State of Tennessee in December 2015 was lower at 5.3 percent. These data, which are not seasonally adjusted, indicate that the unemployment rate in Hardeman County remains higher than that of the state. The per capita annual and median household incomes for Hardeman Country from 2009 through 2013 were an average of $14,975 and $30,973, respectively. By comparison, in the State of Tennessee the per capita annual income for 2009 through 2013 was $24,409, and the median household income was $44,298 (U.S. Department of Labor 2015). The per capita annual income and median household income are higher for the State of Tennessee in comparison to Hardeman County.

### 3.2.2 Environmental Consequences

#### *3.2.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, TVA would not purchase the power from LSC. Therefore, the proposed solar energy facility would not be constructed and there would be no impacts to socioeconomics. The existing land use and the existing socioeconomic conditions would remain the same.

#### *3.2.2.2 Alternative B – Proposed Action Alternative*

Under the Proposed Action Alternative, construction activities at the project site are anticipated to take approximately 6 months to complete. During that time, a crew of 50 to 100 personnel would be employed, with approximately 100 personnel on site during peak construction. Personnel would include a mix of general laborers, electrical technicians, and journeyman-level electricians, a majority of whom would come from the local/regional workforce. Work is anticipated to be conducted 5 days per week, with no weekend or holiday work. Short-term beneficial economic impacts are anticipated resulting from construction activities, including the purchase of some materials, equipment, and services locally, and a temporary increase in local employment and income. This increase would have positive impacts locally and regionally. Local vegetation management providers would be contracted to complete operation and maintenance activities during the lifecycle of the project, which will also result in beneficial economic impacts. Operation and maintenance of the solar system would be completed by regional electrical contractors that are familiar with solar energy systems.

Tennessee offers a special ad valorem property tax assessment for certified green energy production facilities. Tennessee SB 1000 stipulated that the assessed property value of all certified green energy production facilities (as defined in Tenn. Code § 67-4-2007) may not exceed 12.5 percent of installed costs for solar. In addition, Tenn. Code Ann. Section 67-6-346 would allow for LSC to apply for a refund of taxes paid, or to apply for authority to make tax-exempt purchases of machinery and equipment used to produce solar electricity. Therefore, impacts to the local tax base would be slightly positive through a slight increase in assessed property value and associated property taxes (according to CDS estimated at approximately $30,000 per year or $750,000 over the term of the Project). There would be insignificant direct, indirect, or cumulative impacts associated with the operation of the proposed solar facility.

## 3.3 Environmental Justice

### 3.3.1 Affected Environment

EO 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations was issued in 1994 to focus federal attention on the environmental and human health effects of federal actions on minority and low-income populations, with the goal of achieving environmental protection for all communities. The EO directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations to the greatest extent practicable and permitted by law. Although EO 12898 does not apply to TVA, TVA routinely considers environmental justice in its planning processes.

Minority individuals are those who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic origin), or Hispanic. Minority populations in an affected area should be identified where either the minority population of the affected area exceeds 50 percent, or the minority population

percentage of an affected area is meaningfully larger than the minority population percentage in the general population of the surrounding region (CEQ 1997). According to the U.S. Census, the 2013 minority population was 24 percent in the State of Tennessee and 44.9 percent in Hardeman County. By comparison, the minority population percentage located within a one-mile radius of the center of the solar center site was 63 percent (USEPA 2016).

Low-income populations in an affected area should be identified with the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty (CEQ 1997). Poverty status is reported as the number of persons or families with income below a defined threshold level. Hardeman County's poverty rate for the years 2009-2013 was 24.6 percent, which is higher than the State of Tennessee poverty rate for the same years (17.6 percent) (U.S. Census Bureau 2015). By comparison, the low-income population percentage located within a one-mile radius of the center of the solar center site was 52 percent (USEPA 2016).

### 3.3.2 Environmental Consequences

#### *3.3.2.1 Alternative A – No Action Alternative*

Implementation of the No Action Alternative would not result in project-related disproportionate adverse environmental or health impacts to low-income or minority populations.

#### *3.3.2.2 Alternative B – Proposed Action Alternative*

There would be no direct, indirect, or cumulative disproportionate impacts on minority or low-income populations associated with the Proposed Action Alternative. While the minority population and the poverty rate in the vicinity of the project site are higher than the county and state percentages, the proposed facility would not be located adjacent to residential neighborhoods, schools, playgrounds, churches, or other such resources and/or receptors. The temporary increase in construction-related traffic would be negligible (see Section 3.10.2) and therefore, would not be expected to impact local populations in an adverse manner for an extended period of time. Implementation of the Proposed Action is anticipated to result in a slight overall net decrease in air quality pollutants and GHGs, and would not be expected to result in disproportionate adverse environmental or health effects on low-income or minority populations. The Proposed Action would not have the potential to substantially affect human health or the environment through the exclusion of persons, the denial of benefits, or the subjection of persons to discrimination or health and/or safety risks.

## 3.4 Visual Resources

Visual resources are the visual characteristics of a place, including both natural and man-made attributes. How an observer experiences a particular location can be determined by the visual resources at and surrounding that location. The following sections describe the aesthetic and visual characteristics of the project site and surrounding area.

### 3.4.1 Affected Environment

The 160-acre project site is agricultural land located about 1.5 miles southwest of Whiteville. The property is surrounded by agricultural land, scattered residential properties, and a cemetery. Whiteville-Newcastle Road runs along its southern and southeast borders. There is one farm shed located on the property. A majority of the project area is used for agricultural purposes, with a wetland and pond near the southeastern corner and sporadic

tree lines along the western, northeastern, and southeastern boundaries of the project area. A gravel road is located in the south-central portion of the property and would remain under the Proposed Action along with the existing structure.

The nearest residential property from which the solar facilities under both options would be visible is approximately 100 feet south, on the southern side of Whiteville-Newcastle Road, of the proposed facilities (see Figures 3-2 and 3-3). The interconnection line would run through an isolated forested area and within an existing ROW.

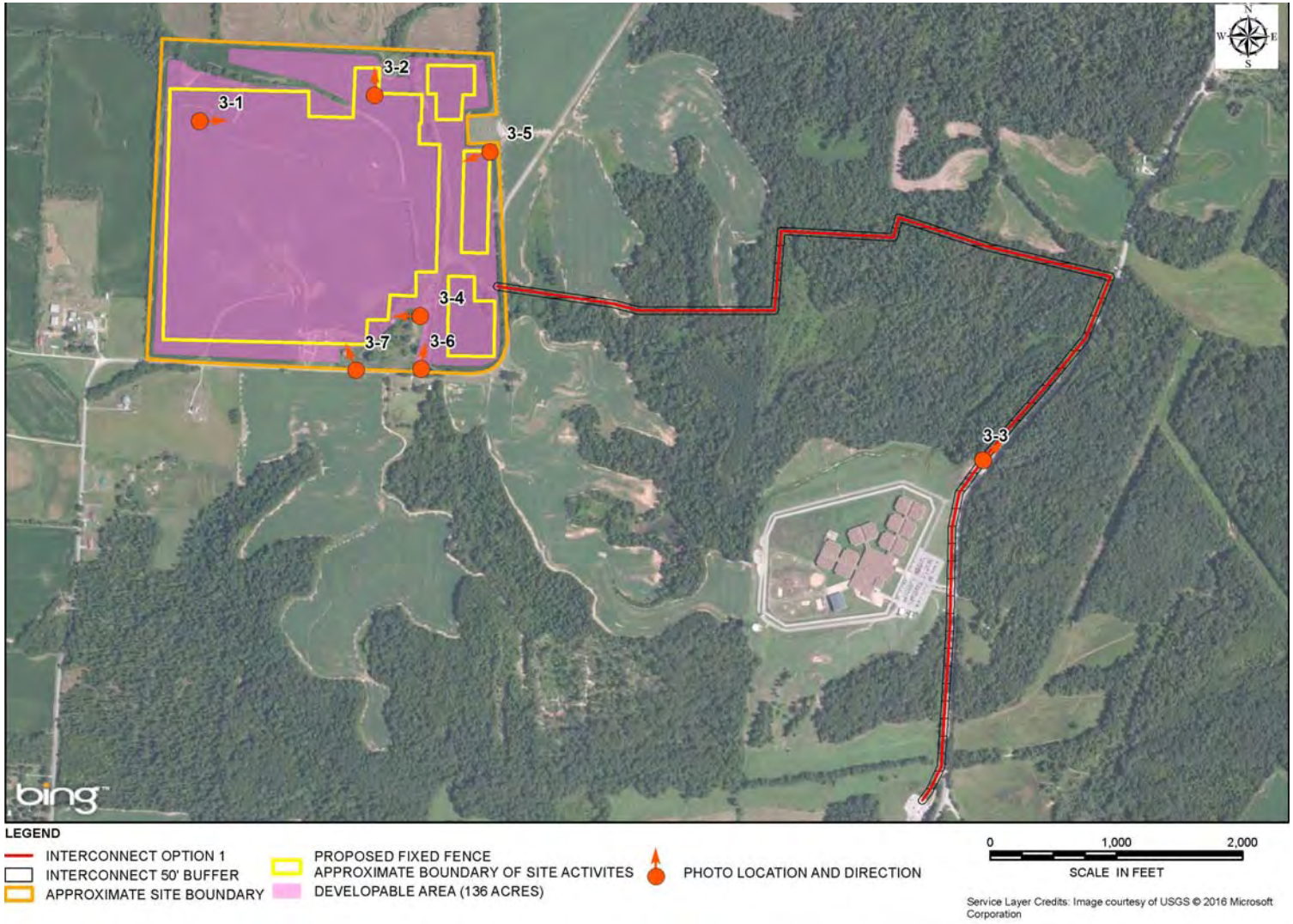


**Figure 3-2. Locations of photographic documentation, with Option 1, single-axis tracking system.**

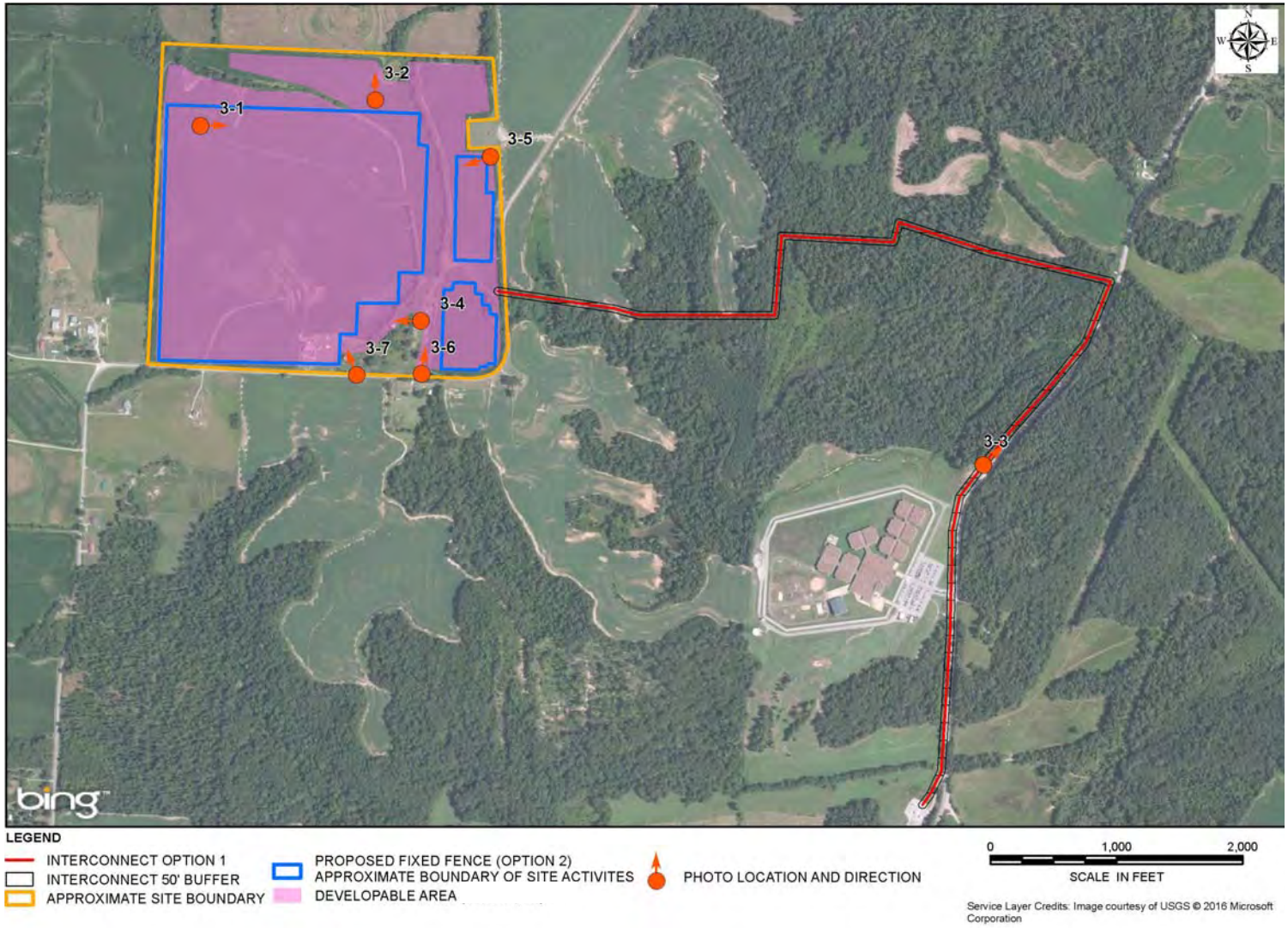


**Figure 3-3. Locations of photographic documentation, with Option 2, fixed tilt system.**

**Photograph 3-1. Overview of project area from the northwest corner.**

**Photograph 3-2. Wooded area in the northeastern corner of the project area.**

**Photograph 3-3 View of power line within the Union Springs Road ROW.**

**Photograph 3-4. Pond located in the southeastern portion of project area.**

**Photograph 3-5. View of project site from Crowder Cemetery.**

**Photograph 3-6. View of project site from southeast corner of the property facing north.**

**Photograph 3-7. View of project site from the south facing north.**

### 3.4.2 Environmental Consequences

#### *3.4.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, TVA would not enter into a PPA with LSC, and the proposed solar energy facility would not be constructed. Therefore, no project-related impacts to visual resources would result, as no change in the appearance of the project site or within the surrounding areas would occur as a result of project activities. Existing views would remain unchanged from the present setting of agricultural land and scattered residences. The landscape may, however, change over time depending on actions of the area landowners.

#### *3.4.2.2 Alternative B – Proposed Action Alternative*

Minor direct, indirect, and cumulative adverse effects would be expected with the Proposed Action Alternative. During the course of construction, visual changes at the project site would result from the presence of construction equipment and delivery equipment, as well as the presence of personnel and their vehicles. In addition, heavy machinery would be visible both on site and travelling to and from the site on existing roadways, changing the now agricultural landscape to one that contains man-made items and materials.

Upon completion, the solar energy facility would consist of approximately 66,000 solar PV panels on steel racking structures and associated electrical equipment on nine concrete pads surrounded by a 6-foot-tall security fence topped with barbed wire and a gate for security and safety purposes. As required by the Hardeman County Planning Commission, an evergreen tree buffer with a minimum height of at least 6 feet would be planted along the perimeter of the solar energy facility, where deemed applicable by the Hardeman County Zoning and Planning Director. This vegetative screen along with the existing sporadic tree

lines along the western, northeastern and southeastern boundaries would help reduce potential visual impacts experienced by the local community by blocking views of solar facility components. The addition of a vegetative screen and fencing would change the appearance of the site through the elimination of middle-ground and background views of expansive farmland that currently exists from adjacent viewing locations. In addition, the commission is requiring that the fence installed consist of opaque or semi-opaque earth tone colors, which would also help further reduce potential visual impacts.

Under both options, the panels would have a maximum height of about 10 feet, making the panels the highest structure associated with the proposed solar energy facility. Under Option 2 (fixed tilt racking system) the solar panels would be set at a fixed angle, facing south. The perception of greater visual impacts would be associated with Option 2, as the fixed panels would face towards residences south of the site along Whiteville-Newcastle Road and the panels would have a fixed maximum height of 10 feet. Under Option 1 (the Proposed Action Alternative), the panels would tilt east to west, visible to adjacent farmland and the Crowder Cemetery, and the panel heights would vary from approximately 6 to 10 ft, depending on the position of the sun.

The interconnection line would consist of 1.9 miles of new overhead lines on new utility poles for the entire route to the substation (see Figure 2-5). Approximately 0.9 mile of the proposed 1.9 mile corridor would require clearing of vegetation/trees and/or trimming of trees. The1.0-mile segment along Union Springs Road would be within an existing ROW that contains poles and utility lines, thereby resulting in no noticeable viewshed changes from current setting. Given the isolated site setting of the 0.9-mile segment and the 1.0 mile segment within an existing ROW, visual impacts associated with the proposed interconnection line would be negligible. Once all solar energy facility components are installed and operational, the only other equipment present would be periodic and associated with maintenance and regular mowing of the site.

Given the overall change from an agricultural landscape to one that contains man-made items, impacts to visual resources would be minor. Portions of the site not used for the installation of the solar energy facility would remain unchanged.

## 3.5 Cultural Resources

Cultural resources include, but are not limited to, prehistoric and historic archaeological sites, historic structures, and historic sites at which important events occurred. Cultural resources are finite, non-renewable, and often fragile. They are frequently threatened by industrial, commercial, and residential development, as well as construction of roads and other infrastructure. Under Section 106 of the National Historic Preservation Act of 1966 (NHPA), TVA is required to consider ways to avoid or minimize effects from TVA undertakings on significant cultural resources. The NHPA addresses the preservation of “historic properties,” which are defined under the Act as any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP).

Two broad categories of cultural resources are archaeological resources and historic architecture. Some examples of archaeological resources are earthworks, weapons and projectiles, human remains, rock carvings, and remains of subsurface structures, such as domestic fire pits. Historic architecture consists of standing structures that are 50 years old or older. Consistent with Section 106 of NHPA, such structures, as well as archaeological resources, must meet certain criteria to qualify for inclusion on the NRHP.

### 3.5.1 Affected Environment

Between April and October 2015, Cultural Resource Analysts, Inc. (CRA) staff, on behalf of ARCADIS and LSC, conducted Phase I archaeological and historic architecture surveys of the area of potential effects (APE) for the proposed solar facility (Bradbury 2015, Hearnes et al. 2015). The purpose of the surveys was to locate and identify archaeological and historic architecture resources within the APE and to evaluate their eligibility for inclusion in the NRHP. Prior to conducting field surveys, CRA and ARCADIS conducted a record and literature search through the Tennessee Division of Archaeology to determine the presence of known archaeological sites and a search through the Tennessee Historical Commission and NRHP records to determine the presence of known architectural/historical resources within the APE.

**Architectural Resources**

Desktop and field analyses were completed by CRA regarding the Proposed Action's potential to affect historic properties. The purpose of the analyses was to identify previously recorded historic architectural resources within the APE, which was defined to include a 0.5-mile buffer surrounding the solar energy facility. The review included an analysis of historical aerial imagery and topographic quadrangles, a review of the files maintained by the Tennessee Historical Commission, and a review of the NRHP and National Historic Landmark databases maintained by the National Park Service. Information on known historic architectural resources occurring in or near the APE was examined, as well as previously completed cultural resources reports and historic documents pertinent to the APE. Upon confirming that there are no previously recorded historic architectural resources within the APE, a comparative review of modern and historical imagery and historical topographic quadrangle maps was undertaken to identify any historical architectural resources (50 years of age or older) located within the APE. Based on the above research, a total of 12 single or grouped structures were identified within project area on the 1959 quadrangle map, ten of which were within the 0.5-mile APE (Figure 3-4). Each of these structures was visited, and lines of sight were documented. Construction dates for each of the identified architectural resources were determined using data in the Tennessee Property Viewer.

Eleven of the 12 structures were single family dwellings, barns, or sheds that reflect forms and property types common throughout rural western Tennessee that were undistinguished in character and construction. Based on preliminary review of information, they do not appear to have significance associations under NRHP Criteria A or B and lack significance to be considered eligible under Criterion C. Crowder Cemetery on the eastern border of the project site may contain burials dating to as early as the 1830s. Many of the marked graves date to the twentieth century and have gravestone types and forms typical for the county and region. Therefore, there is very low potential for aboveground historic properties eligible for listing in the NRHP within the APE.

None of the identified resources within the APE are known to have any significant associations to noteworthy events or persons that would warrant listing in the NRHP under Criterion A or B, nor are the resources noteworthy examples of a particular style,

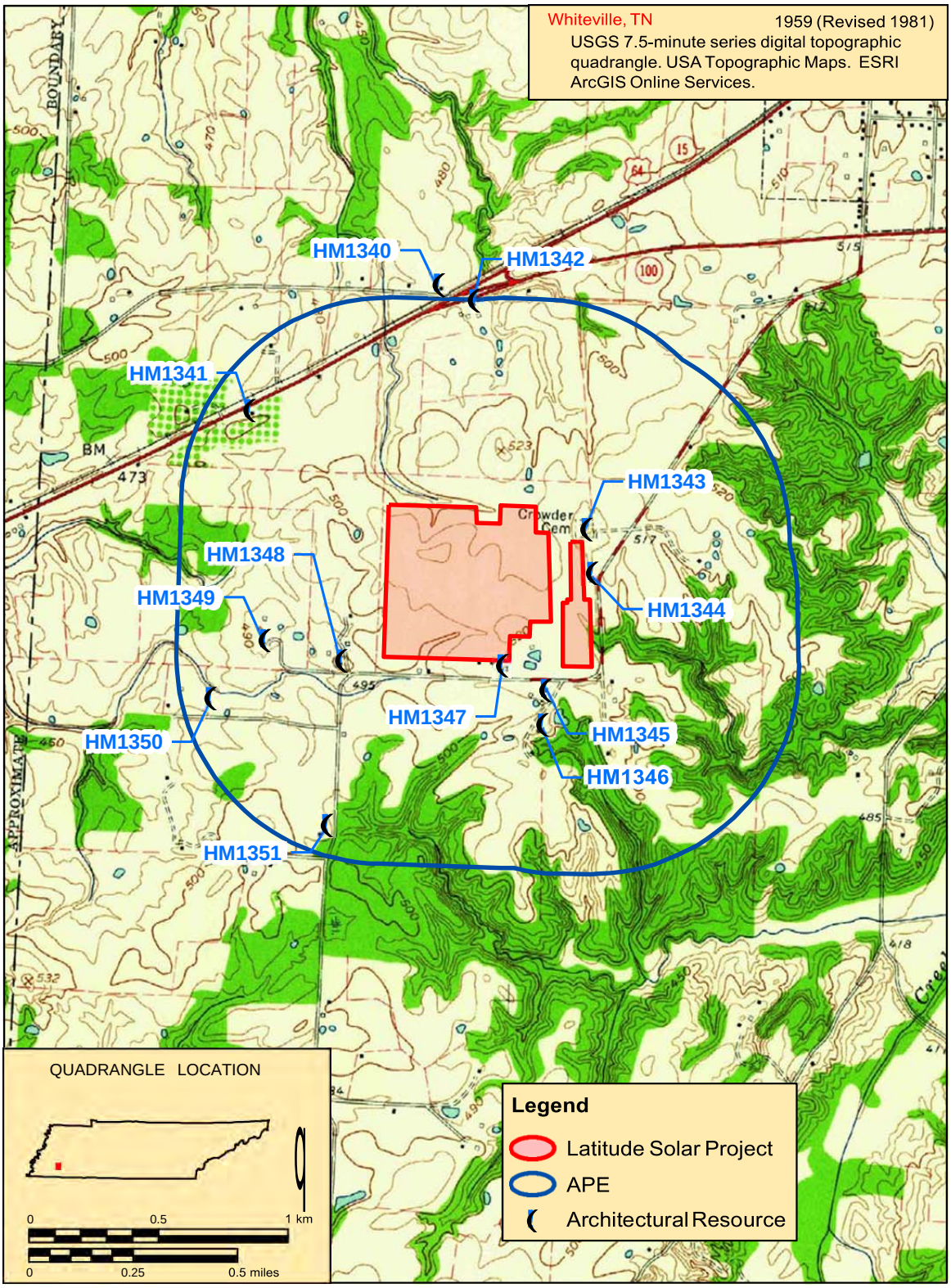


**Figure 3-4. Architectural survey results.**

type, or design that would suggest eligibility under Criterion C. CRA recommended that none of these resources are eligible for listing in the NRHP. Consequently, CRA recommended that a finding of no historic properties affected is appropriate for the Proposed Action (Hearnes et al. 2015). TVA concurred with this recommendation.

**Archaeological Resources**

Background research was conducted at the Tennessee Division of Archaeology (TDOA) Site File in Nashville, Tennessee prior to the initiation of fieldwork. No previously-recorded archaeological sites were located within the proposed project site development. The archaeological survey consisted of a pedestrian survey supplemented by systematic shovel testing. As a result of the survey, three historical artifact concentrations were documented (Figure 3-5). All three were associated with previously-documented structures, but were not classified as archaeological sites because of a lack of diagnostic historical artifacts indicating pre-1933 occupation. The findings associated with these three sites (Bradbury 2015) are as follows:

- Non-Site Locality (NSL) 1 was located on a low rise in the east-central portion of the project area. A structure is depicted at this location on the 1959 Whiteville, Tennessee quadrangle map. The remains of a house are still at this location. The house is of cinder block construction with a concrete slab foundation. No cultural materials were recovered from shovel tests excavated on the 30-meter transects established within the site boundaries. Additional shovel tests were excavated around the house in an effort to identify any potential, deposits associated with the house. Eight shovel tests were excavated in the front yard, back yard, and along both sides of the standing structure. Only two of these tests produced artifacts.

- NSL 2 was located in the south-central portion of the project area. Several structures are depicted at this location on the 1959 quadrangle map. At the time of the survey, only a barn was present at this location. The barn was of cinder block construction. Portions of the inside of the barn may contain wood from an earlier barn. Only one shovel test excavated in this area produced artifacts. A light density of materials was recovered from the surface over a 30-meters diameter area. A push pile of construction debris was located approximately 90-meters to the east of the barn area. Portions of the area evidenced red clay subsoil at the surface, likely the result of bulldozing activities. The majority of the site has probably been destroyed by bulldozing activities.

- NSL 3 was identified through a surface collection in the southwestern portion of the project area. Shovel tests in the area failed to produce artifacts. A light density of historic artifacts was recovered from the surface collection of this area after a heavy rain. A structure is depicted at this location on the 1959 Whiteville, Tennessee quadrangle map.

Due to the low density of material recovered at NSLs 1, 2, and 3, and a lack of diagnostic artifacts demonstrating pre-1933 occupation of the structures previously documented at those locations, the three localities were not classified as archaeological sites, and are thus considered ineligible for the NRHP. No archaeological sites were identified during the survey. Consequently, no further archaeological investigations were recommended (Bradbury 2015). TVA concurred with this recommendation.

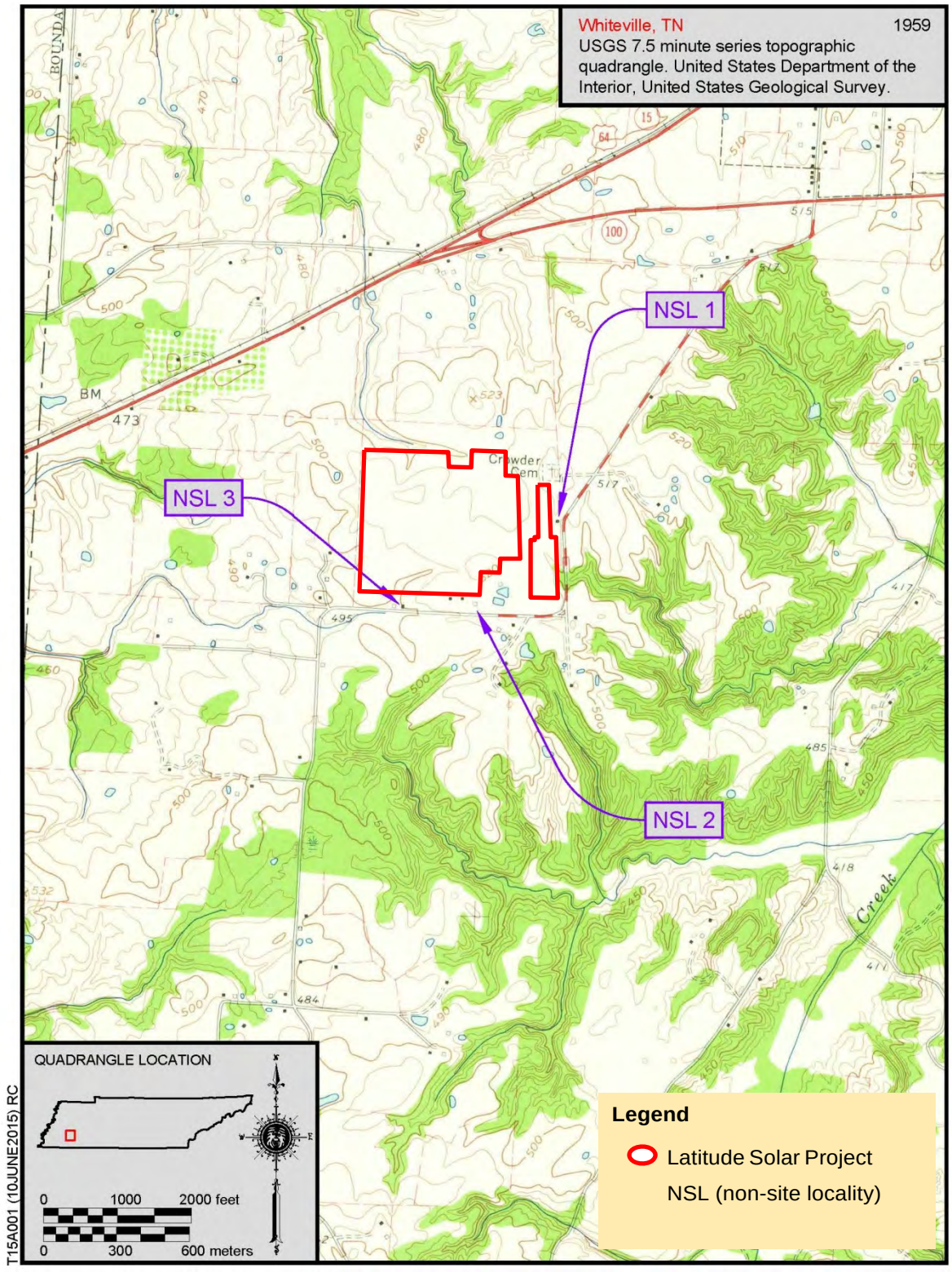


**Figure 3-5. Archaeological survey results.**

### 3.5.2 Environmental Consequences

#### *3.5.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, the proposed solar energy facility would not be constructed; therefore, no project-related impacts to historic properties would occur.

#### *3.5.2.2 Alternative B – Proposed Action Alternative*

There would be no direct, indirect, or cumulative impacts associated with the Proposed Action Alternative. Based on the results of the archaeological and architectural surveys, no archaeological sites or historical resources listed on or eligible for inclusion on the NRHP occur within the potentially affected area and none would be affected by the construction and operation of the proposed solar facility and interconnection line. TVA has consulted on these findings with the State Historic Preservation Office and with federally recognized Indian tribes. On February 26, 2016, the State Historic Preservation Office concurred with these findings (Appendix A).

## 3.6 Air Quality and Greenhouse Gas Emissions

### 3.6.1 Affected Environment

Air quality is a valuable environmental resource. Through its passage of the Clean Air Act, Congress mandated the protection and enhancement of our nation's air quality resources. National Ambient Air Quality Standards (NAAQS; Table 3-1) for the following criteria pollutants have been set to protect the public health and welfare:

- Sulfur dioxide ($SO_2$)
- Ozone
- Nitrogen dioxide ($NO_2$)
- Particulate matter whose particles are less than or equal to 10 microns ($PM_{10}$)
- Particulate matter whose particles are less than or equal to 2.5 microns ($PM_{2.5}$)
- Carbon monoxide (CO)
- Lead

The primary NAAQS were promulgated to protect the public health, and the secondary NAAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas in violation of the NAAQS are designated as nonattainment areas. New sources to be located in or near these areas may be subject to more stringent air permitting requirements. National standards other than annual standards are not to be exceeded more than once per year (except where noted). Based on available ambient air quality data, Hardeman County is currently in attainment for criteria pollutants (USEPA 2015a).

**Table 3-1 National Ambient Air Quality Standards.**

| Pollutant | Primary and Secondary Standards | Averaging Time | Level | Form |
|---|---|---|---|---|
| CO | Primary | 8-hour | 9 ppm | Not to be exceeded more than once per year |
| | | 1-hour | 35 ppm | |
| Lead | Primary and secondary | Rolling 3 month average | 0.15 µg/m$^3$ (1) | Not to be exceeded |
| $NO_2$ | Primary | 1-hour | 100 ppb | 98th percentile, averaged over 3 years |
| | Primary and secondary | Annual | 53 ppb (2) | Annual mean |
| Ozone | Primary and secondary | 8-hour | 0.070 ppm (3) | Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years |
| $PM_{2.5}$ | Primary | Annual | 12 µg/m$^3$ | Annual mean, averaged over 3 years |
| | Secondary | Annual | 15 µg/m$^3$ | Annual mean, averaged over 3 years |
| | Primary and secondary | 24-hour | 35 µg/m$^3$ | 98th Percentile, averaged over 3 years |
| $PM_{10}$ | Primary and secondary | 24-hour | 150 µg/m$^3$ | Not to be exceeded more than once per year on average over 3 years |
| $SO_2$ | Primary | 1-hour | 75 ppb (4) | 99th Percentile of 1hour daily maximum concentrations, averaged over 3 years |
| | Secondary | 3-hour | 0.5 ppm | Not to be exceeded more than once per year on average over 3 years |

**Source**: USEPA 2015d

**Abbreviations**: ppb = parts per billion, ppm = parts per million, µg/m$^3$ = micrograms per cubic meter.

**Notes:**

(1) Final rule signed on October 15, 2008. The 1978 lead standard (1.5 µg/m$^3$ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard except that, in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual $NO_2$ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(3) Final rule signed on March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, the United States Environmental Protection Agency (USEPA) revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed on June 2, 2010. The 1971 annual and 24-hour $SO_2$ standards were revoked in that same rulemaking. However, these standards remain in effect until 1 year after an area is designated for the 2010

standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

GHGs are chemical compounds in the Earth's atmosphere that trap and convert sunlight into infrared heat. Gases exhibiting greenhouse properties come from both natural and man-made sources. The most common GHGs emitted from natural processes and human activities include carbon dioxide, methane, and nitrous oxide. The primary GHG emitted by human activities in the U.S. is carbon dioxide, representing more than 80 percent of total GHG emissions, which comes mostly from energy use (USEPA 2015b). Agricultural activities also contribute to GHG emissions. Various management practices (e.g., irrigation, tillage, fertilizer application) for agricultural soils can lead to production and emissions of nitrous oxide. Management of agricultural soils accounts for more than half of the agriculture sector emissions, which were 9 percent of the total U.S. GHG emissions in 2013 (USEPA 2015c).

### 3.6.2 Environmental Consequences

#### *3.6.2.1 Alternative A – No Action Alternative*

Selecting the No Action Alternative would not impact air quality at or surrounding the project site. There would be no short- or long-term emissions due to construction or operation of a solar energy facility. Ambient air quality would remain unchanged from that which exists currently. In contrast, the No Action Alternative would also not result in a net decrease in criteria pollutants and GHGs due to reduction in the use of off-site fossil fuel-based electricity.

#### *3.6.2.2 Alternative B – Proposed Action Alternative*

Minor impacts to air quality would occur during the construction of the proposed solar facility. Construction activities would result in emissions from construction equipment and vehicles, employee vehicles, and fugitive dust mobilization resulting from grading and vegetation clearing activities and on-site vehicle movement. Vehicles would emit PM, nitrogen oxides, CO, volatile organic compounds, and $SO_2$ from the combustion of gasoline and diesel fuel. The impacts of these emissions would be negligible and would not adversely affect area air quality. Fugitive dust emissions would be primarily deposited at or in close proximity to the location of project activities and the project site. Best management practices (BMPs), including dust suppression using water from nearby non-potable sources, would be employed as necessary to mitigate for dust and other construction-related emissions that could impact localized air quality. Therefore, it is anticipated that air quality impacts associated with construction of the solar energy facility would be negligible and limited in duration.

Minor increases in GHG emissions would result from construction activities. The impacts of these GHG emissions would be negligible in comparison to other regional sources of GHG emissions. The operation of the solar energy facility would result in a small increase in the capacity of non-emitting generating sources in TVA's energy resource portfolio and would generate power that otherwise would have been largely generated by the combustion of fossil fuels. Therefore, operation of the proposed solar energy facility would result in a minor beneficial impact to air quality and reduced GHG emissions. The impacts of GHG emissions and associated climate change from the TVA power system are described in TVA (2015). The reduction in GHG emissions would have a small but cumulatively beneficial impact on climate change.

## 3.7 Noise

### 3.7.1 Affected Environment

Noise is defined as an unwanted sound that can induce hearing loss or interfere with ordinary daily activities, such as communication or sleep. People's reaction to noise varies according to the duration, type, and characteristics of the source; distance between the source and the listener; listener sensitivity; background noise level; and time of day. It is important to keep in mind the distinction between the physical characteristics used to quantify sound levels and the more qualitative or subjective aspects of the person, animal, or object on the receiving end; it is the adverse reaction to sound or the annoyance created by sound that is then defined as noise. Despite the more subjective reaction, however, noise can be measured; that is, sound sources having certain characteristics can reasonably be expected to induce harm or annoyance, and this can be quantified in a statistically meaningful manner. Level of annoyance depends on the intensity, frequency weighting (pitch), and duration of the sound. To quantify noise and describe its effects on the natural and human environment, a basic description of sound terminology is presented below.

As a sound wave moves through the atmosphere, a temporary increase in pressure occurs; it is the pressure change that is detected as sound. The magnitude of the pressure change is the loudness and the frequency of those temporary changes is the pitch. The healthy human ear detects pressure differences over a wide range of sensitivities. A handy method for comparing these vast pressure differences is to describe them in exponential rather than linear terms. This simplifies the units and more closely depicts the way humans actually perceive sound levels. The decibel (dB) is a logarithmic ratio of the increase in atmospheric pressure a sound event causes compared to a defined reference or baseline pressure.

Because the human ear responds differently to different sound frequencies, the perceived loudness increases far more rapidly than it does for mid-frequency sounds. The sound pressure level represented by a given decibel value is, therefore, typically adjusted to make it more relevant to sounds that the human ear hears especially well. For example, an "A-weighted" decibel (dB[A]) is derived by emphasizing mid-range frequencies to which the human ear responds especially well and de-emphasizing, or penalizing, frequencies lower than 1,000 Hertz and frequencies higher than 5,000 Hertz.

To account for the typically lower levels of background noise at night, community noise levels are typically described using the A-weighted day-night sound level (DNL). DNL is defined as the average sound energy in a 24-hour period with a 10 dB penalty added to the nighttime levels (10:00 p.m. to 7:00 a.m.). DNL is a useful descriptor for noise because it averages ongoing yet intermittent noise, and it measures total sound energy over a 24-hour period.

The Noise Control Act of 1972 directs federal agencies to comply with applicable federal, state, and local noise control regulations. Hardeman County does not have any ordinances or regulations governing noise levels. According to the Whiteville municipal code, the erection (including excavation) activities in any residential area or section shall be limited to between the hours of 7:00am and 6:00pm, except in case of urgent necessity in the interest of public health and safety (Municipal Technical Advisory Service Institute for Public Service 1992). The project site is located outside the jurisdictional limits of Whiteville; however, it is adjacent to residential areas. The nearest noise receptor to the site that may experience impacts is a residence located approximately 100 feet to the south of the project site

boundary, across Whiteville-Newcastle Road. In addition, Crowder Cemetery is located on the eastern project site border.

Given the site setting, typical current noise levels would be associated with agricultural farm machinery operating within the site boundaries and automotive vehicles on the surrounding rural county roads. As noted in Table 3-2, truck traffic on the county roads generates noise levels of 74–79 dBA at a distance of 50 feet. The USEPA has estimated that farm tractors generate noise levels of 100 dBA at a distance of 50 feet (USEPA 1971). Therefore, the highest noise levels at the site are associated with the current periodic operation of farm machinery.

### 3.7.2 Environmental Consequences

#### *3.7.2.1 Alternative A – No Action Alternative*

Selecting the No Action Alternative would not increase noise levels at or surrounding the project site. Noise levels would remain unchanged from that which exists currently, which includes usage of farm machinery such as farm tractors and harvesters.

#### *3.7.2.2 Alternative B – Proposed Action Alternative*

Construction activities would result in short-term increase in noise levels in the project area. This increase would occur between 7 am and 5 pm, 5 days per week during the 6-month construction period. Noise sources would include variable pitches and volumes from vehicles and equipment involved in site preparation activities and the installation of racking structures. Maximum noise levels for the types of construction equipment expected to be used range from 74 to 101 dB(A) at a distance of 50 feet (Table 3-2). With multiple pieces of equipment operating concurrently, noise levels would be relatively high during daytime periods at locations within several hundred feet of active construction sites. According to the USEPA, the zone of relatively high construction noise typically extends to distances of 400 to 800 feet from the site of major equipment operations (USEPA 1971).

**Table 3-2. Maximum noise levels at 50 feet for common construction equipment.**

| Equipment Type | Maximum Noise Level ($L_{max}$) at 50 Feet (dB[A], slow[1]) |
|---|---|
| Flat Bed Truck | 74 |
| Concrete Truck | 79 |
| Compactor (ground) | 83 |
| Dozer | 82 |
| Dump Truck | 76 |
| Excavator | 81 |
| Generator | 81 |
| Pickup Truck | 75 |
| Grader | N/A |
| Vibratory Pile Driver | 101 |
| Warning Horn | 83 |

**Source:** USDOT 2015

[1] Slow response as measured on the A scale of a sound level meter or time-weighted average.

Residences are located to south of the project site, with the nearest residence located approximately 100 feet to the south of the proposed site activities. Given the temporary nature of proposed construction activities, the limited amount of noise generated by heavy equipment, and the proposed setbacks from receptors, this impact would be negligible and limited in nature. In addition, limited truck and worker traffic would be audible on nearby roads, having temporary minor adverse effects; however, these effects would not be distinguishable from normal traffic activities. The Crowder Cemetery is located on the eastern edge of the project site and is surrounded by it on three sides. Based on recent verbal communications with the Hardeman County Planning Department and an inspection of the cemetery, burials in it are infrequent. LSC would suspend any construction activities in the immediate vicinity of the cemetery during any funeral services and burials to minimize disturbing them.

Construction noise would dominate the soundscape for all on-site personnel. Construction personnel, particularly equipment operators, would use personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations.

Following the completion of construction activities, the ambient sound environment would be expected to return to existing levels. There would be no noise from operating of the solar energy facility, with the exception of periodic mowing of the site to maintain grassy areas. Mowing would occur infrequently and in short duration, and would produce noise similar to existing noises in the surrounding areas such as vehicle traffic, mowers, and farm equipment. The cabinets containing the electrical equipment (inverters and transformers) typically contain any equipment noise. There would be no long-term changes in the noise environment, and overall noise impacts would be insignificant.

## 3.8 Utilities

### 3.8.1 Affected Environment

Electrical service to the project area is provided by BEA, which purchases the power it distributes from TVA. Public water and wastewater service is not available in the immediate vicinity of the project site and nearby residents rely on wells and septic fields. Natural gas service is similarly not available in the immediate vicinity of the project site. No significant renewable energy sources are currently located in the project vicinity.

### 3.8.2 Environmental Consequences

#### *3.8.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, the proposed solar energy facility would not be constructed; therefore, there would be no project-related impacts to utilities. The existing land use would be expected to remain the same, and utility services in the immediate project area would otherwise remain unchanged.

#### *3.8.2.2 Alternative B – Proposed Action Alternative*

A portion of the new interconnection power line would be constructed on an existing BEA power line ROW. The BEA line in this segment of the ROW would be removed and rebuilt as part of the construction of the interconnection line. LSC would coordinate the construction of the interconnection line with BEA to avoid disruption of service to the surrounding areas. There could, however, be a brief service outage and LSC and BEA would take measures to minimize any outage. Such an outage would result in a minor adverse impact to customers. Switchgear at the solar facility point of interconnection would allow the solar facility to be disconnected from the area electrical system in response to an

event that would otherwise damage the facility or the area electrical system. Aside from the interconnection line, no other utility services would be required for the construction or operation of the solar facility and no other utility services would be affected. Overall impacts would be minimal and no cumulative impacts are anticipated.

## 3.9 Waste Management

### 3.9.1 Affected Environment

This section describes waste (both non-hazardous and hazardous) materials and hazardous wastes associated with project site and surrounding area. The Bolivar-Hardeman County Solid Waste Landfill is located approximately 10 miles east of the project site. This landfill receives solid waste under Tennessee Department of Environment and Conservation Permit No. SNL350000223. Under the permit, this landfill can accept municipal wastes, construction and demolition materials, rock, wood wastes, yard trimmings, soil, asphalt, scrap metal, ash from wood combustion, and similar types of wastes. Hazardous waste materials are not accepted.

A Phase I environmental site assessment of the project area was completed by Arcadis in July 2015. No contaminated areas or structures containing hazardous materials or petroleum products were identified on the project site or within the immediate surrounding areas. Therefore, there are no documented environmentally impacted areas in or immediately adjacent to the project site.

### 3.9.2 Environmental Consequences

#### *3.9.2.1 Alternative A – No Action Alternative*

Selecting the No Action Alternative would not affect solid or hazardous waste conditions at or surrounding the project site. Potential for impact to hazardous waste would remain unchanged from that which exists currently, which includes usage of farm machinery for agricultural usage.

#### *3.9.2.2 Alternative B – Proposed Action Alternative*

The Proposed Action Alternative would result in minor direct and indirect impacts and cumulative impacts. Waste associated with construction and operation of the proposed solar energy facility would be handled and disposed of in accordance with local, state, and federal regulations. Construction activities would involve use of machinery (e.g., semi-trucks, field trucks, tractors) fueled by petroleum products. Construction contractors would be responsible for preventing spills by implementing proper storage and handling procedures. There are no environmentally impacted areas within the project site or surrounding area; therefore, construction activities would not exacerbate potentially sensitive environmentally impacted areas.

The nearby Bolivar Hardeman County Solid Waste Landfill would accept construction waste (e.g., wooden crates, cardboard boxes, plastic packaging, and excess electrical wiring). Waste associated with construction of the proposed solar energy facility would be disposed of in separate dumpsters for metals, wood, and general trash. Pickup would be (at minimum) once a week, and more often if necessary. The dumpsters would be in the on-site construction staging area, and construction crews will have 3-yard trash skips with them when working at remote areas of the site. The generation of waste would be temporary and would result in a minor impact to the landfill due to the disposal of the waste materials. Construction waste materials would be recycled to the extent practicable. Waste generation during operation would be minimal and would mainly result from the

replacement of equipment. A decommissioning plan for the proposed solar facility would be developed in order to document the recycling plan of solar facility components and current exemptions from hazardous waste regulations applicable to recycling of such materials. The decommissioning plan would be implemented at the expiration of the PPA, contingent upon the execution of an amended or alternative PPA for the sale of power after the 20-year period.

## 3.10 Transportation

### 3.10.1 Affected Environment

Roadways and other transportation infrastructure serving the project site and surrounding area are described in this section. The main mode of transportation near the project site is via roadways, while within the project site there is one gravel access road which connects to Whiteville-Newcastle Road to the south. The Whiteville-Newcastle Road connects to US 64/State Route 100, a major east-west highway, on the south side of Whiteville (Figure 1-1). State Route 179 runs north from Whiteville for approximately 15 miles to Interstate 40, which provides regional access to the area.

The average annual daily traffic (AADT) is the average number of vehicles traveling along a roadway each day. The Tennessee Department of Transportation has quantified both the AADT and the highest number of vehicles that travel within a 1-hour period (referred to as "One Way Peak Hour") for some roads serving the project area (Table 3-3).

**Table 3-3. Existing average annual daily traffic and one-way peak hour on nearby roadways.**

| Roadway | Average Annual Daily Traffic - 2014 | Number of Lanes | One Way Peak Hour |
|---|---|---|---|
| Whiteville-Newcastle Rd. – east of project site near Fayette County line (Station 81) | 565 | 2 | 38 |
| State Route 179 – Whiteville (Station 20) | 1,175 | 2 | 79 |
| Interstate 40 – west of State Route 76 20 miles from site (Station 991) | 36,063 | 4 | 1124 |
| State Route 15 – north of project site (Station 61) | 4,849 | 4 | |

**Source:** Tennessee Department of Transportation 2015

### 3.10.2 Environmental Consequences

#### *3.10.2.1 Alternative A – No Action Alternative*

Selecting the No Action Alternative would not affect transportation conditions at or surrounding the project site.

#### *3.10.2.2 Alternative B – Proposed Action Alternative*

Under the Proposed Action Alternative, minor short-term impacts would occur due to additional vehicles and day-labor traffic during construction. These effects would be primarily due to worker commutes and delivery of equipment and materials to and from the

construction site. Approximately 50 to 75 crew members would be on site from approximately 7 am to 5 pm, 5 days a week, for a 4- to 6-week peak construction period. A majority of these workers would likely come from the local or regional area, and others would come from outside the region. Workers would either drive their own vehicles or carpool to the project site, and parking would be available on site. Construction equipment and material delivery would require 5 to 10 semi-tractor trailer trucks visiting the project site per day for approximately 6 weeks beginning a couple of weeks before peak construction activities. These larger vehicles would be easily accommodated by existing roadways. During the remaining 4.5- to 5 months of the 6-month construction period, an average of 20 to 30 crew members would be onsite.

A large portion of the construction traffic would access the site by Whiteville-Newcastle Road and State Route 179. At the peak of construction, a maximum of about 60 to 96 additional vehicle trips per day would occur on these roads, assuming about half of the workers carpool to the site. This would result in maximum increases over the AADTs of about 17 percent for Whiteville-Newcastle Road and 8 percent for State Route 179. Potential one way peak hour traffic would increase by about 126 percent on Whiteville-Newcastle Road and about 60 percent on State Route 179 assuming the one way peak hour and solar facility construction worker traffic overlap. The resulting local increases in traffic during construction could cause minor traffic delays near the project area. These delays would likely occur at the beginning (7 am) and end (5 pm) of the workday. This increase would be temporary and would end with the construction phase. The existing transportation infrastructure would be sufficient to support the increase in vehicle traffic. Although the effects would be minor, contractors would route and schedule construction vehicles as part of an overall construction management plan, and would strategically locate staging areas in advance at the project site to minimize traffic impacts.

Traffic during facility operation would be minimal and would consist of periodic visits to conduct facility inspections and maintenance. Overall, the Proposed Action Alternative would result in minor, temporary, direct and indirect impacts during construction, but no cumulative impacts.

## 3.11 Geology and Soils

### 3.11.1 Affected Environment

The project site is located in the Gulf Coastal Plain Province within the Mississippi embayment of West Tennessee. This region extends in a wide belt from New Jersey to Texas along the coast of the United States. The rock formations of this region consist of sedimentary rocks from the Cenozoic, tertiary age consisting of sand, silt, clay, and gravel, which were deposited mostly in a marine environment. According to the U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) Web Soil Survey and Soil Survey of Hardeman County, the entire project area contains silt loam soils (NRCS 2014, Appendix B). Loam soils retain nutrients and water while allowing excess water to drain away, making them ideal for agricultural uses. Small portions of the site contain silt loam soils with steep slopes, which are prone to severe erosion.

Prime farmland, as defined by the USDA, “is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). The soils are of the highest quality and can economically produce sustained high yields of crops when treated and managed

according to acceptable farming methods." Approximately 89 percent (142.5 acres) of the property is designated as prime farmland (Figure 3-6). The soil types considered prime farmland are Kurt silt loam, Lexington silt loam, Lexington silty clay loam, and Loring silt loam.


**Figure 3-6 Prime farmlands on the proposed Latitude Solar Center site.**

### 3.11.2 Environmental Consequences

#### *3.11.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, existing resource trends would occur. Limited amounts of soil erosion would likely continue within the project site and in the farm fields in association with normal crop practices. Agricultural crop practices and associated soil conservation measures would also continue within the project site. No direct, indirect, or cumulative impacts to soil resources would occur under this alternative.

#### *3.11.2.2 Alternative B – Proposed Action Alternative*

The solar facility would be designed to meet local building codes and seismic requirements and on-site geologic features would be considered when determining the exact location of the solar panel support posts and other project components.

The Proposed Action Alternative would result in minor, temporary direct and indirect soil impacts and a small cumulative impact due to loss of agricultural production. Under both options, there would be grading during the construction of the solar energy facility. As a

result there would be a slight increase in erosion and sedimentation. The creation of new impervious surfaces, in the form of equipment pads, would result in a slight increase in stormwater runoff and potential increase in soil erosion.

As discussed in Section 1.3, an NPDES Permit for discharges of stormwater associated with construction activities would be required. As a part of the NPDES application process, a Stormwater Pollution Prevention Plan (SWPPP) would be developed to identify the necessary management practices that would be employed during construction to mitigate potential impacts. Temporary erosion control measures, as shown on the SWPPP or as deemed necessary during construction by the design engineer, would be used to contain disturbed soils on site and prevent sedimentation of adjacent wetlands and waters. These temporary best management practices (BMPs) may include the use of berms, sediment basins, fiber mats, fencing, netting, gravel, mulches, grasses, slope drains, and other erosion control features as necessary to ensure economical, effective, and continuous erosion control during construction and post-construction and to ensure compliance with the with the NPDES permit.

The Farmland Protection Policy Act (FPPA) directs federal agencies to evaluate the impacts of their proposed actions on prime farmlands and to take measures to avoid adversely impacting prime farmlands. This land evaluation and site assessment system produces a farmland conversion impact rating score based on the amount of prime farmland in the county, the amount of prime farmland being affected, the proximity to urban services, and other factors. A high score indicates the federal agency consider alternative sites with potentially lower impacts to prime farmlands (USDA 2014). There are approximately 110,928 acres of prime farmland in Hardeman County, which is approximately 25 percent of the total land area in the county. The 135-acre area development site represents 0.12 percent of the prime farmland in the county.

The construction and operation of the proposed solar energy facility would remove the site from agricultural production. Topsoil removed during site grading and other construction activities would be redistributed on the site and construction activities would mave little impact on the potential agricultural productivity of the site. In accordance with the Farmland Protection Policy Act (FPPA), Arcadis and TVA coordinated with the local office of the NRCS to determine the effects on prime farmlands. On August 18, 2015, the USDA issued a letter indicating that no further assessment was required under the FPPA (Appendix A). This was based on the fact that, while agricultural production would cease on the project site, long-term impacts to prime farmlands and soil productivity on the site would be insignificant and the site could be readily returned to agricultural production once the solar facility is dismantled. Based on the limited site disturbance and USDA findings, there would be minor direct and indirect effects on prime farmland under the Proposed Action Alternative.

## 3.12 Surface Water

### 3.12.1 Affected Environment

In June and August 2015, ARCADIS personnel conducted a field survey that identified three streams and two wetlands within the project site. An additional six streams and one wetland were identified along the interconnection line route (Figure 3-7).

- Stream 1 (Photo 3-8) is located along the northern boundary of the project site. The stream begins in the agricultural field as ephemeral and the channel extends

northwest off of the site. When the stream enters the forested area in the northwestern corner of the site, the stream quickly becomes intermittent. Standing water with no flow was observed in pools along the stream channel during the site visit. The vegetation along the forested stream banks consisted of Osage orange, red cedar, buckeye, Chinese privet, and red oak. Stream 1 is located outside of the proposed solar facility development area.

- Stream 2 is an intermittent stream located near the fence on the northeastern boundary of the project site flowing from Wetland A. Vegetation along the stream banks and surrounding areas consisted of Chinese privet, red cedar, poison ivy, Osage orange, and red oak. Stream 2 is located outside of the proposed solar facility development area.

- Stream 3 flows east out of Wetland B through agricultural fields into a forested area near the fence on the southeastern boundary of the project site. The stream begins as an ephemeral stream and becomes intermittent in the forested section. In the forested area, the stream was approximately 4 feet wide and has a defined bed and bank. The stream was characterized by an absence of alluvial deposits, low sediment deposits, and medium roots. No vegetation, fish, or invertebrates were observed in the stream. Stream 3 is located outside of the proposed solar facility development area.

- Stream 4 (Photograph 3-9) is located along the interconnection line route. The stream originates as an ephemeral stream draining an agricultural field with planted crops and becomes intermittent within the interconnection corridor before flowing south into Stream 3. It has severely eroded stream banks approximately 30 feet tall and overgrown with kudzu. Black willow was present in the stream bed and along the banks of the stream. Red oak, blackberry, and poke weed were also present.

- Stream 5 is a perennial stream, crossing the interconnection line route in a forested area. The stream and ravine were clearcut and overgrown with invasive kudzu. The water depth was approximately 2 inches with eroded banks 2 to 3 feet high and a sand and silt substrate.

- Stream 6 (Photograph 3-10) within the interconnection line corridor is intermittent and then becomes a perennial stream in a forested area downstream of the line corridor. The stream was highly eroded and incised with undercut banks approximately 6 to 7 feet high. It was sinuous with a sandy substrate and strongly defined bed and banks. The proposed interconnection line would run parallel to the stream for several hundred feet.

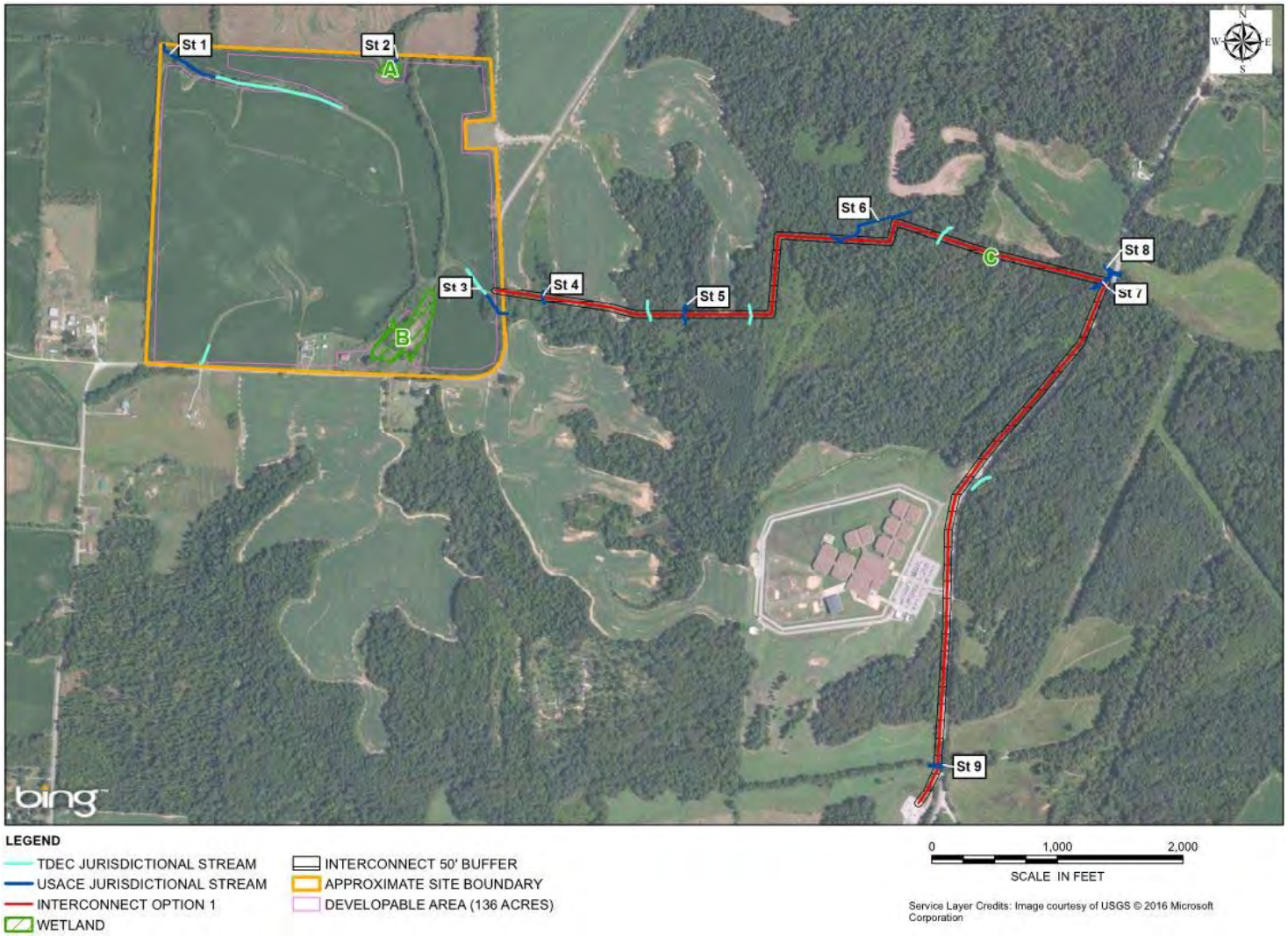


**Figure 3-7. Streams and wetlands on the solar facility site and along the interconnection line route.**

- Stream 7 is a perennial stream that crosses the interconnection line route in a forested area. The stream is composed of a pure sand substrate more than 4 feet deep with no standing water in a channel 15 to 20 feet wide with banks 6 to 7 feet tall. There were roots and grade control structures in the channel. The vegetation on the banks consisted of red maple, beech, Christmas fern, grape vine, and poison ivy.

- Stream 8 is a perennial stream that crosses the interconnection route and flows through a bridge under Union Springs Road. The stream was 10 to 15 feet wide with 5- to 6-foot high banks and a sandy substrate. The surrounding scrub-shrub vegetation consisted of box elder, eastern sycamore, Chinese privet, goldenrod, asters, and kudzu.

- Stream 9 is a perennial stream that crosses the interconnection line route and is located a few hundred feet north of the BEA substation. The stream flows through a bridge under Whiteville Newcastle Road within the cleared ROW of the existing power line. The stream channel was approximately 5 to 10 feet wide with 4-foot tall banks. The surrounding vegetation consisted of scrub-shrub eastern sycamore, box elder, Chinese privet, trumpet creeper, asters, and Johnson grass.

**Photograph 3-8. View of Stream 1 in the forested area located outside of the solar energy facility footprint.**

**Photograph 3-9. View of Stream 4 covered in invasive kudzu.**

**Photograph 3-10. View of Stream 6 stream channel.**

### 3.12.2 Environmental Consequences

#### *3.12.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, existing resource trends would continue to occur. Limited amounts of soil erosion would likely continue to affect streams in the project area. No project-related direct, indirect, or cumulative impacts to surface water resources would occur under this alternative.

#### *3.12.2.2 Alternative B – Proposed Action Alternative*

The Proposed Action Alternative would result in minor, temporary direct and indirect impacts to streams during construction of the solar facility and interconnection line. The proposed solar facilities under each layout option (Figures 2-1 and 2-2) have been designed to avoid direct impacts to streams. The proposed interconnection line would cross several streams.

A majority of the solar facility site would be graded during construction. Other activities with the potential to cause sediment runoff include access road construction and trenching to install electrical conduits. Prior to these construction activities, erosion and sedimentation controls (e.g., silt fencing) would be installed as required by the NPDES permit. Appropriate buffer areas would be established along streams and existing vegetation would be maintained in these buffer areas. Any buried electrical conduits crossing streams would be installed by horizontal directional drilling instead of trenching. The site would be promptly revegetated after other construction activities are completed.

New impervious surfaces would be created by access road improvements and the installation of concrete equipment pads. These would cover a very small proportion of the site and would result in a negligible increase in stormwater runoff. The spacing of the solar panels would minimize the potential for heavy sheeting of water from the panel surfaces. The operation of the solar facility would otherwise have little to no adverse effect on surface waters. The maintenance of permanent grass and herbaceous plant cover on the solar facility site could result in a small long-term beneficial effect to area surface waters from the reduction in sediment, fertilizers, and other agricultural chemicals from the previously cultivated farmland.

The proposed electrical interconnection line would cross several streams and appropriate BMPs would be implemented during its construction and operation. Vegetation clearing within the line ROW at stream crossings would be minimized to the extent feasible to construct and maintain the line. Poles to support the line would be placed outside identified stream beds. Construction equipment would avoid crossing stream and wet weather conveyance channels; where this is not feasible, temporary stream crossings would be constructed in a manner to minimize impacts.

With the avoidance of direct impacts to streams on the solar facility site and proper implementation of BMPs and adherence to the provisions of the NPDES permit, implementation of the Proposed Action Alternative would result in insignificant temporary direct and indirect adverse surface water impacts during construction. As mentioned above, there would be small, beneficial, long-term impacts to surface water during operation of the solar energy facility. No cumulative impacts to surface waters are anticipated.

## 3.13 Wetlands

### 3.13.1 Affected Environment

Wetlands are those areas inundated by surface water or groundwater such that vegetation adapted to saturated soil conditions is prevalent. Examples include swamps, marshes, bogs, and wet meadows. Wetland fringe areas are also found along the edges of most watercourses and impounded waters (both natural and man-made). Wetland habitat provides valuable public benefits including flood/erosion control, water quality improvement, wildlife habitat, and recreation opportunities.

In June and August 2015, ARCADIS personnel conducted a wetland delineation survey on the project site and along the interconnection line route. Two wetlands were delineated on the project site and one along the line route (Figure 3-7, Table 3-4). The wetland delineations were conducted in compliance with applicable Clean Water Act standards.

Three potentially jurisdictional wetlands were delineated within the project area. Jurisdictional waters of the United States, including streams and wetlands, are defined by 33 CFR Part 328.3(b) and are protected by Section 404 of the Clean Water Act (33 USC 1344), which is administered and enforced in western Tennessee by the U.S. Army Corps of Engineers (USACE), Memphis District. Wetland boundary locations were determined using the methodology described in the Regional Supplement to the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 2010).

A TVA-developed modification of the Ohio Rapid Assessment Method (Mack 2001) specific to the TVA regions (Tennessee Valley Authority Rapid Assessment Method [TVARAM]) was used to categorize wetlands by their functions, sensitivity to disturbance, rarity, and ability to be replaced. The categorization was used to evaluate impacts and to determine the appropriate levels of mitigation, if necessary. TVARAM scores are used to classify wetlands into three categories. Category 1 wetlands are considered “limited quality waters.” They represent degraded aquatic resources having limited potential for restoration with such low functionality that lower standards for avoidance, minimization, and mitigation can be applied. Category 2 includes wetlands of moderate quality and wetlands that are degraded but which carry reasonable potential for restoration. Category 3 generally includes wetlands of very high quality or of regional/statewide concern, such as wetlands that provide habitat for threatened or endangered species. Avoidance and minimization are the preferred mitigation measures for Category 2 and 3 wetlands.

**Table 3-4. Wetlands in the project area.**

| Wetland Identifier | Type[1] | Acreage | TVARAM Category (score) |
|---|---|---|---|
| Wetland A | PEM1Hh | 0.33 | Category 1 (29) |
| Wetland B | PSS1Hh | 2.72 | Category 2 (42) |
| Wetland C | PEM1B | 0.020 | Category 1 (16) |
| **Total** | | **3.07** | |

[1] Type Classifications (Cowardin 1979): PEM1=palustrine, emergent, persistent; PSS= palustrine, scrub-shrub; B= saturated; E=seasonally flooded/saturated; H=permanently flooded; f=farmed; h=diked/impounded

Following is a description of the wetlands.

- Wetland A is a 0.33 acre palustrine emergent persistent wetland associated with Stream 2 near the northern edge of the solar facility site. The wetland is a permanently flooded diked or impounded depression in an active agricultural field. Dominant vegetation in Wetland A included black willow, water primrose, and *Carex* sedges. Goldenrod was also present.

- Wetland B is a 2.72 acre palustrine, scrub shrub broadleaf deciduous wetland associated with Stream 3 in the southeastern corner of the solar facility site. The wetland has a palustrine, central open water portion that is a remnant farmpond. This is surrounded by a seasonally flooded/saturated fringe wetland extending down a constructed drainage ditch and into plowed agricultural fields. The dominant vegetation was black willow, sedges, knotweed, and cattail.

- Wetland C is a 0.020 acre palustrine forested broadleaved deciduous, saturated wetland on the interconnection line route. It has been created within the ruts of compacted soils of an old road. Surrounding dominant shading vegetation included red maple, loblolly pine, Chinese privet, smooth sumac, and black gum. Dominant herbaceous vegetation in the wetland included, Japanese stiltgrass, mild waterpepper, rice cutgrass, and poison ivy.

### 3.13.2 Environmental Consequences

Wetlands are protected under Section 404 of the Clean Water Act and by EO 11990. In order to conduct specific activities in wetlands, authorization under a Section 404 permit from the USACE is required depending on the wetland's size and hydrologic connectivity to a navigable waterway. EO 11990 requires all federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities.

#### *3.13.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, TVA would not purchase power from the proposed solar facility, which would not be constructed or operated. The owner of the property would continue to use the site for agricultural production, and environmental conditions on the property would remain the same. Therefore, there would be no project-related impacts to wetlands under the No Action Alternative.

#### *3.13.2.2 Alternative B – Proposed Action Alternative*

There would be no adverse direct, indirect, or cumulative impacts associated with the Proposed Action Alternative. The solar facility has been designed to avoid Wetlands A and B. Permanent buffers around the wetlands would be established and maintained throughout construction and during operation of the solar facility and interconnection line. The interconnection line would cross Wetland C and utility poles would not be placed in the wetland. If construction vehicles have to pass through this wetland area, impacts would be mitigated through placement of swamp mats. Vegetation clearing in Wetland C would be minimized to the amount necessary to construct and operate the line. The removal of nearby trees within the line ROW would eliminate some shading of Wetland C, potentially changing the wetland vegetation. This would likely have little effect on the hydrology of the wetland.

## 3.14 Vegetation

### 3.14.1 Affected Environment

The project site is located within the Loess Plan subecoregion of the Mississippi Valley Loess Plains ecoregion (USEPA 2012). This ecoregion stretches from near the Ohio River in western Kentucky to Louisiana. It consists primarily of irregular plains, with oak-hickory and oak-hickory-pine natural vegetation. The subecoregion contains gently rolling, irregular plains. The region is dominated by agriculture and most of the forest cover has been removed to create cropland.

According to aerial photography and site surveys, approximately 97.5 percent (156.3 acres) of the 160-acre project area is cropland planted in corn in 2015 (Figure 3-8). Although current aerial photographs show shrubs in narrow rows within the cultivated fields, these shrub areas were not present in 2015. Narrow rows of trees occur along the boundaries of the solar facility site. The dominant species in these wooded strips include oaks, red maple, sweet gum, sumacs, and Chinese privet. The forested area adjoining Stream 1 is dominated by Osage orange and Chinese privet while the forested area around Stream 3 is dominated by shagbark and mockernut hickories and white oak.

About 0.7 miles of the interconnection route are forested. The forested areas contain white oak, shagbark hickory, black oak, eastern red cedar, sassafras, winged elm, red maple, tulip poplar, American sycamore, sweet gum, and red oak. The understory along most of the route is sparsely vegetated and no unique plant communities were observed during field surveys.

EO 13112 prohibits the introduction of invasive species and provides for their control to minimize the economic, ecological, and human health impacts that those species potentially cause. In this context, invasive species are nonnative species that invade natural areas, displace native species, and degrade ecological communities or ecosystem processes (Miller et al. 2010). Most of the solar facility site is cropland. Invasive plants are common along the interconnection line route and the species present include kudzu, Japanese honeysuckle, field clover and Chinese privet. Several of the kudzu patches are large (Photograph 3-9) with few other plant species present.

### 3.14.2 Environmental Consequences

#### *3.14.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, TVA would not purchase power from the proposed solar facility, which would not be constructed or operated. Changes to local plant communities resulting from natural ecological processes and human-related disturbance would continue to occur. There would be no direct, indirect, or cumulative vegetation impacts as a result of implementation of the No Action Alternative.

#### *3.14.2.2 Alternative B – Proposed Action Alternative*

There would be minor long-term direct and indirect adverse impacts to vegetation within the project area with the Proposed Action Alternative. No cumulative impacts to vegetation are anticipated. Under both solar facility options, 135 acres of agricultural farmland would be cleared of tall vegetation and, graded. These agricultural habitats are common throughout the region and do not support native plant communities with conservation value. Some trees in the upland areas would be trimmed to minimize shading of the solar panels. Following construction, disturbed parts of the solar facility site would be revegetated with native or non-invasive grass and volunteer native grass and herbaceous species. This

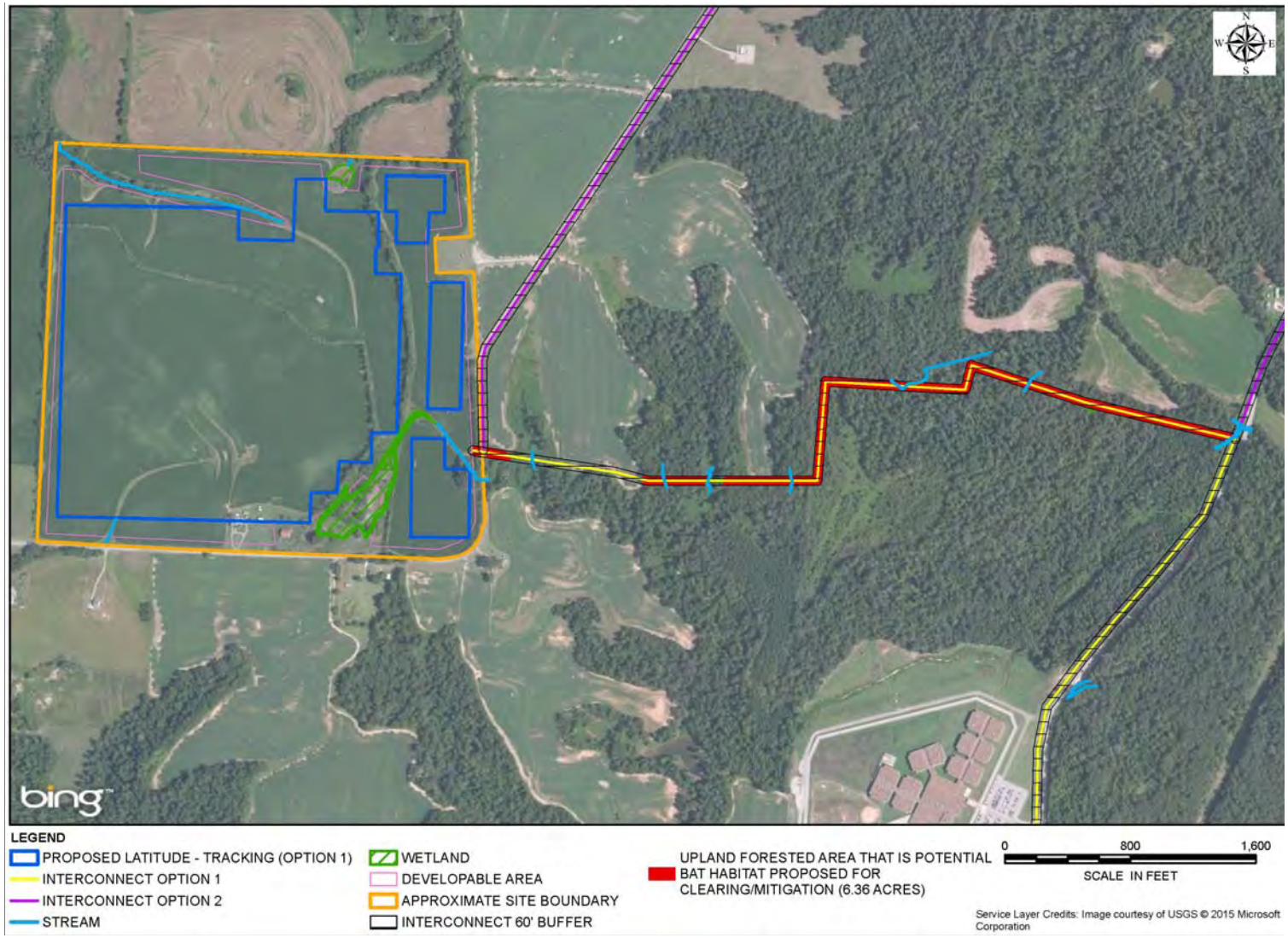


**Figure 3-8. Forested areas within project area.**

low-growing vegetation would be maintained by routine mowing during the operation of the facility. The conversion of the site to permanent grass and herbaceous vegetation would have a small, long-term beneficial impact by increasing the diversity of plant and animal species on the site.

Along the interconnection route, 6.4 acres of forested upland areas would be cleared (see Figure 3-8). Following construction, the interconnection line ROW would be maintained as grassland and shrubland. The forested areas are already fragmented and the clearing of the ROW would have minor impacts to the quantity and quality of forests in the area.

## 3.15 Wildlife

### 3.15.1 Affected Environment

The wildlife in the oak-hickory ecosystem is highly diverse. The wildlife species in the project area include numerous species adapted to disturbance and typically found in rural, agricultural areas. Examples of typical wildlife in the project area include American crow, Carolina chickadee, tufted titmouse, American goldfinch, red-bellied woodpecker, downy woodpecker, eastern meadowlark, red-winged blackbird, groundhog, eastern chipmunk, eastern gray squirrel, ring-necked snake, gray rat snake, five-line skink, copperhead snake, spring peeper and upland chorus frog (Whitaker and Hamilton 1998, LeGrand 2005; Niemiller et al. 2013).

During the June and August 2015 field surveys, ARCADIS biologists observed various wildlife species on the site including northern cardinal, white-tailed deer, turkey vultures, mourning dove, racer black rat snake, raccoon, and a red-tailed hawk. No unique or rare wildlife species or habitat was observed within the project site.

### 3.15.2 Environmental Consequences

#### *3.15.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, TVA would not purchase power from the proposed solar facility, which would not be constructed or operated. Changes to local habitats and associated wildlife resulting from natural ecological processes and human-related disturbance would continue to occur. There would be no direct, indirect, or cumulative wildlife species impacts as a result of the implementation of the No Action Alternative.

#### *3.15.2.2 Alternative B – Proposed Action Alternative*

There would be minor direct, and no adverse indirect, or cumulative impacts on the wildlife of the project area under the Proposed Action Alternative. Much of the 135 acres of agricultural upland fields on the solar facility site would be graded and solar panels would be installed on most of this area. Approximately 6.4 acres of upland forested habitat (see Figure 3-8) would be cleared during the construction of the interconnection power line. Much of the wildlife within the approximately 141-acre construction area would be displaced or eliminated during construction activities.

Following construction, the cleared areas would be revegetated with grass and herbaceous species and maintained as grassland during the operation of the system. While this could potentially provide habitat for many wildlife species adapted to grassland habitats, the presence of the solar panels would likely limit the use of the site by some wildlife. Given the prevalence of early successional and edge wildlife habitats in the area, direct impacts to wildlife populations would be minor, and adverse indirect or cumulative impacts are not anticipated. .

## 3.16 Threatened and Endangered Species

The Endangered Species Act requires federal agencies to conserve species listed as endangered or threatened and to determine the effects of their proposed actions on listed species and their critical habitat. Endangered species are those determined to be in danger of extinction throughout all or a significant portion of their range. Threatened species are those determined to be likely to become endangered within the foreseeable future. Section 7 of the Endangered Species Act requires federal agencies to consult with the USFWS when their proposed actions may affect endangered or threatened species and their critical habitats.

### 3.16.1 Affected Environment

Federally listed species potentially occurring in the project area were determined through a search of the Initial Project Scoping feature of the USFWS Information, Planning, and Conservation System (USFWS 2013). State-listed species were determined through a quadrangle search of the Tennessee Department of Environment and Conservation, Natural Heritage Inventory Program's Interactive Rare Species Database (Tennessee Department of Environment and Conservation 2015). These databases indicated that three federally and state-listed species, as well as one species which is only state-listed, could occur in the project area (Table 3-5).

**Table 3-5. Federally and state-listed endangered and threatened species in the vicinity of the project site.**

| Common Name | Scientific Name | Federal Status[1] | State Status (Rank[2]) |
|---|---|---|---|
| **Mammals** | | | |
| Indiana bat | *Myotis sodalis* | END | END (S1) |
| Northern long-eared bat | *Myotis septentionalis* | THR | NMGT (S4) |
| Gray bat | *Myotis grisescens* | END | END (S2) |
| **Amphibians** | | | |
| Southern Cricket Frog | *Acris gryllus* | | (S2S1) |

[1] Status abbreviations: END=Endangered, NMGT=In need of management, THR = Threatened
[2]State rank abbreviations: S1 - critically imperiled with five or fewer occurrences; S2 = very rare and imperiled within the state, 6 to 20 occurrences or fewer; S4=Apparently secure.

During winter, Indiana bats hibernate in caves and mines located in karst areas of the United States. In summer, they use a variety of forest habitats for roosting, foraging, and raising young (USFWS 2014). Potential roost sites are located under the exfoliating bark, cracks, crevices, and/or hollow live trees or snags greater than 5 inches in diameter at breast height (dbh). Roost trees are typically within canopy gaps in a forest, in a fence line, or along a wooded edge. Habitats in which maternity roosts occur include riparian zones, bottomland and floodplain habitats, wooded wetlands, and upland communities. Indiana bats typically forage in semi-open to closed (open understory) forested habitats, forest edges, and riparian areas.

Similar to the Indiana bat, the northern long-eared bat hibernates in caves and mines in the winter. During summer, it roosts singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees and/or snags typically 3-inch dbh or greater (USFWS 2014). Males and non-reproductive females may also roost in cooler places such as caves and mines. This bat selects roost trees based on suitability to retain bark or provide cavities

or crevices. It has also been found, rarely, roosting in structures like barns and sheds. These bats emerge at dusk to forage in upland and lowland woodlots and tree-lined corridors, feeding on insects (USFWS 2014). Suitable summer habitat consists of a wide variety of forested/wooded habitats and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Typical summer habitat is occupied from mid-May through mid-August each year (USFWS 2014).

The third protected bat species is the gray bat that lives year round in caves. During the winter, gray bats hibernate in deep, vertical caves; while, in the summer, they roost in limestone karst caves near rivers and waterways (USFWS 2015). They eat flying aquatic and terrestrial insects along rivers and streams.

In April 2015, a Phase 1 Indiana bat, northern long-eared bat, and gray bat habitat assessment was conducted on the project site by ARCADIS to determine the availability of suitable summer habitat for these listed species. Surveys were conducted in accordance with the 2015 Range-wide Indiana Bat Summer Survey Guidelines (USFWS 2014). The survey found approximately 6.7 acres of potential summer roosting habitat and foraging habitat for the Indiana and northern long-eared bats on the solar facility site and along the interconnection line route. Suitable foraging habitat also occurs in the project area. No caves were identified.

The southern cricket frog is found in aquatic habitats including grassy margins of swamps, marshes, lakes, ponds, streams, ditches, and nearby temporary pools. Potential habitat for this species may occur within the project site along the edges of the ponds and streams located on the project site and interconnection route.

### 3.16.2 Environmental Consequences

#### *3.16.2.1 Alternative A – No Action Alternative*

Under the No Action Alternative, TVA would not purchase power from the proposed solar energy facility, which would not be constructed or operated. Environmental conditions on the property would remain the same. Therefore, there would be no direct, indirect or cumulative impacts to threatened and endangered species are anticipated.

#### *3.16.2.2 Alternative B – Proposed Action Alternative*

There would be direct, indirect, and cumulative adverse impacts associated with the clearing and grading of potential forested bat habitat during the Proposed Action Alternative. Approximately 6.4 acres of forest providing habitat suitable for roosting listed bats would be cleared within the interconnection line ROW (see Figure 3-8). Suitable habitat for the southern cricket frog along streambanks and in wetlands would not be affected. TVA is consulting with the USFWS on the potential effects of the loss of suitable bat roosting habitat. TVA and LCS would implement appropriate measures to minimize and mitigate these effects; these measures could include seasonal restrictions on tree removal and compensatory mitigation payments. No other federally listed endangered or threatened species would be affected, and no impacts to the state-listed southern leopard frog would occur due to the avoidance of wetland habitat.

## 3.17 Unavoidable Adverse Environmental Impacts

The Proposed Action could cause some unavoidable adverse environmental effects. Specifically, construction activities would temporarily increase noise and traffic as well as

impact the aesthetics of the general area. The existing tree lines and distances of the proposed activities from sensitive receptors would limit this impact. Construction activities would be limited to daytime hours, which would help minimize noise impacts during construction. Transportation impacts during construction would be minimized by development of an overall construction management plan that would route and schedule construction vehicles as well as strategically locate staging areas in order to ensure that impacts are minor. About 6.4 acres of forest would be cleared. With the application of appropriate and standard environmental safeguards such as those described above, these unavoidable adverse effects are expected to be minor.

## 3.18 Relationship of Short-Term Uses and Long-Term Productivity

Short-term uses are those that generally occur on a year-to-year basis. Examples are wildlife use of forage, timber management, recreation, and uses of water resources. Long-term productivity is the capability of the land to provide resources, both market and non-market, for future generations. In this context, long-term impacts to site productivity would be those that last beyond the life of the project.

Construction activities would cause a minor, short-term loss of wildlife habitat. The construction and operation of the solar facility would eliminate agricultural production on the solar facility site. Following the eventual dismantling of the solar facility and restoration of the site, farming could resume with minimal long-term loss of potential productivity.

## 3.19 Irreversible and Irretrievable Commitments of Resources

An irreversible or irretrievable commitment of resources would occur when resources would be consumed, committed, or lost because of the project. The commitment of a resource would be considered irretrievable when the project would directly eliminate the resource, its productivity, or its utility for the life of the project and possibly beyond.

Construction and operation activities would result in an irretrievable and irreversible commitment of natural and physical resources. The implementation of the Proposed Action Alternative would involve irreversible commitment of fuel and resource labor required for the construction, maintenance, and operation of the solar energy facility. It would also involve the irretrievable commitment of agricultural and forested areas within the project area for the life of the solar energy facility. Because removal of the solar arrays and associated on-site infrastructure could be accomplished rather easily, and the facility would not irreversibly alter the site, the project site could be returned to its original condition or used for other productive purposes once it is decommissioned.

# CHAPTER 4 – LIST OF PREPARERS

**Brian Maillet (Arcadis)**

| | |
|---|---|
| Education: | PMP, B.S., Environmental Science, Soil Engineering Minor |
| Experience: | 19 years in NEPA compliance, new and traditional energy assessments, including generation, transmission, and legacy |
| Involvement: | Project management |

**Charles P. Nicholson (TVA)**

| | |
|---|---|
| Education: | Ph.D., Ecology and Evolutionary Biology; M.S., Wildlife Management; B.S., Wildlife and Fisheries Science |
| Experience: | 38 years in zoology, endangered species studies, and NEPA compliance |
| Involvement: | NEPA compliance, document preparation and review |

**Hallie Hearnes (CRA)**

| | |
|---|---|
| Education: | M.A. Public History, Middle Tennessee State University; B.S. Historic Preservation, Southeast Missouri State University |
| Experience: | 5 years in architectural history and regulatory compliance |
| Involvement: | Architectural analysis and reporting |

**Andrew Bradbury (CRA)**

| | |
|---|---|
| Education: | M.A. Anthropology/Archaeology, University of Tennessee; B.A. Anthropology/Archaeology, University of Tennessee; |
| Experience: | 30 years in archaeology history and regulatory compliance |
| Involvement: | Archaeological analysis and Reporting |

**Sara M. Moore (Arcadis)**

| | |
|---|---|
| Education: | M.S. Environmental Science and M. in Public Affairs; B.S. Environmental Science |
| Experience: | 14 years in ecology and regulatory compliance |
| Involvement: | Biological resources, Section 404 compliance, biological field lead, document preparation |

**Tiffany Novak (Arcadis)**

| | |
|---|---|
| Education: | M.S. Geography and Climatology; B.S. Environmental Science |
| Experience: | 10 years in regulatory and NEPA compliance |
| Involvement: | Project management, NEPA compliance, document preparation |

**Elizabeth B. Hamrick (TVA)**

| | |
|---|---|
| Education: | B.S., Wildlife and Fisheries Science, B.A. Biology and Anthropology |
| Experience: | 13 years; 4 years endangered species studies and NEPA compliance |
| Involvement: | Threatened and endangered species compliance |

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# Appendix A – Correspondence

USDA

United States Department of Agriculture

Date: August 18, 2015

Brian Mailet
ARCADIS
114 Lovell Road, Suite 202
Knoxville, Tennessee 37934

Re: Proposed Providence Solar Center in Madison County, Tennessee

Mr. Mailet,

I have reviewed your request for a Farmland Protection Policy Act (FPPA) assessment on the above-mentioned project. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by a Federal agency, or with assistance from a Federal agency.

Given the type of project (Solar Energy), and how the project is implemented, leads me to conclude that this project does not permanently convert farmland. Given that the project could be removed and normal farming practices resume on the site without much difficulty. As such, this projects appears to meet the exemption for the FPPA assessment. **Therefore, the FPPA assessment is not be required for this project.**

If the Federal agency assisting you with this project disagrees with my conclusion, let me know and I will contact our agency FPPA advisor and review the request again. If you have any additional questions, please contact me at (731) 668-0700.

Charles L. Davis
Resource Soil Scientist

Natural Resources Conservation Service - Jackson Area Office
235 Oil Well Road, Jackson, Tennessee 38305
Voice (731) 668-0700 Fax (855) 564-5848

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

January 29, 2016

Mr. E. Patrick McIntyre, Jr.
Executive Director
Tennessee Historical Commission
2941 Lebanon Road
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), LATITUDE SOLAR FARM, WHITEVILLE, HARDEMAN COUNTY, TENNESSEE (35° 18' 20" N, 89° 10' 04" W)

The Tennessee Valley Authority (TVA) proposes to execute a power purchase agreement (PPA) with Latitude Solar Center (LSC), LLC, a subsidiary of Coronal Development Services LLC, for electricity generated by LSC's proposed 20-megawatt (MW) solar farm near the community of Whiteville in Hardeman County, Tennessee. The footprint of the proposed solar farm would directly impact approximately 135 acres of a 160-acre tract, which LSC would lease for a 20-year period. TVA has determined that this proposed PPA constitutes an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. By this letter, we are initiating consultation with your office regarding the proposed Latitude Solar Farm Project.

The solar energy system would be composed of either a single-axis tracker array or a fixed tilt array system. Whichever type of array is chosen, the tops of the solar panels would reach a maximum height of 10 feet above ground. The panels would be secured using a series of posts, racks, and other hardware. The posts would be installed into the ground to a typical depth of up to 8 feet below ground surface (bgs), depending on soil conditions and wind patterns. Construction of the proposed solar facility would require minimal grading, minimal clearing of vegetation, driving posts, and assembling the racking and solar panels. Direct current wiring connecting the arrays to inverters would be buried (typically 24 to 36 inches bgs). Each inverter, along with a transformer, would be mounted on concrete equipment pads. No night lighting or security lighting would be installed as part of the project. The solar array would be surrounded by a six-foot security fence, which would be screened by evergreen plantings. An overhead transmission line (TL) would be built for the connection to Bolivar Electric Authority's Union Springs substation. Three alternate TL connection corridors were considered; the preferred route is 1.9 miles in length.

TVA has determined that the area of potential effects (APE) for historic architectural resources consists of the area within a half-mile radius surrounding the circa 135-acre proposed solar array, from which an unobstructed view of the project would be possible. The APE for archaeological resources consists of the entire 160-acre project site and the 3.25 miles of TL connection route alternates.

Coronal Development contracted with Arcadis to perform a phase I archaeological survey of the archaeological APE and an architectural survey of the architectural APE. The surveys were performed by Cultural Resource Analysts, Inc. (CRA). Enclosed are two copies of the draft archaeological survey report, titled *Phase I Archaeological Survey of the Proposed 20MW Latitude Solar Farm in Whiteville, Hardeman County, Tennessee*, along with one CD containing a digital copy

of the report. Also enclosed are two bound copies and two digital copies of the architectural survey report, titled *Architectural History Survey for the Proposed 20MW Latitude Solar Installation, Hardeman County, Tennessee*.

CRA's site file and literature search indicated that no archaeological sites had been recorded previously within the APE. The archaeological survey resulted in the identification of three non-site localities. CRA recommends that all three non-site localities are ineligible for inclusion in the National Register of Historic Places (NRHP).

The site file and literature search also indicated that the architectural APE contains no extant previously recorded architectural properties. The study documents that six previously recorded properties within the APE have been destroyed since their initial recordation (HM85B, HM86B, HM87B, HM88B, HM89B, and HM90B). The survey identified 12 previously unrecorded architectural resources (HM1340 – HM1351). CRA recommends that all 12 resources are ineligible for inclusion in the NRHP.

TVA has reviewed the enclosed report and agrees with CRA's findings and recommendations. TVA finds that there are no NRHP-listed or –eligible resources within the APE.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP.

Pursuant to 36 CFR Part 800.4(d)(1), we are seeking your concurrence with TVA's findings and determination that the proposed undertaking would result in no effects on historic properties.

If you have any questions or comments, please contact Richard Yarnell by telephone at (865) 632-3463 or by email at wryarnell@tva.gov.

Sincerely,

Clinton E. Jones
Manager, Biological and Cultural Compliance
Safety, River Management and Environment
WT11C-K

SCC:CSD
Enclosures
cc (Enclosures):
Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
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TENNESSEE HISTORICAL COMM SSION
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www.tnhistoricalcommission.org

Received 3/4/16

February 26, 2016

Mr. Clinton Jones
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

RE: TVA, CULTURAL RESOURCES ASSESSMENT, LATITUDE SOLAR FARM, WHITEVILLE, HARDEMAN COUNTY, TN

Dear Mr. Jones:

At your request, our office has reviewed the above-referenced cultural resources survey report in accordance with regulations codified at 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739). Based on the information provided, we concur that the project area contains no historic properties eligible for listing in the National Register of Historic Places.

If project plans are changed or archaeological remains are discovered during construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act.

Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb