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SR MILLINGTON II SOLAR

ENVIRONMENTAL ASSESSMENT

Shelby County, Tennessee

Prepared for:
Tennessee Valley Authority
Knoxville, Tennessee

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
AC	alternating current
AADT	annual average daily traffic
AOI	area of interest
APE	Area of Potential Effects
AR	anti-reflective
ARAP	Aquatic Resource Alteration Permit
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dBA	A-weighted decibel
DC	direct current
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPPA	Farmland Protection Policy Act
GHG	greenhouse gas
IPaC	Information for Planning and Conservation
IRP	Integrated Resource Plan
kV	kilovolt
LF	linear foot
MW	megawatt
MVA	mega volt amp
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA Mid-South	Navy Support Activity Mid-South
NWI	National Wetlands Inventory
NWP	Nationwide Permit
OSHA	Occupational Safety and Health Administration
PCN	Pre-Construction Notification
PEM	Palustrine Emergent (wetland type)
PFO	Palustrine Forested (wetland type)
PGA	peak ground acceleration
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
PSS	Palustrine Scrub-Shrub (wetland type)
PUB	Palustrine Unconsolidated Bottom (wetland type)
PV	photovoltaic
REC	Recognized Environmental Conditions
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SOW	Scope of Work
SPCC	Spill Prevention, Control, and Countermeasure
SRC	Silicon Ranch Corporation
SR Millington II	SR Millington II, LLC
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TDOA	Tennessee Division of Archaeology
TDOT	Tennessee Department of Transportation
THC	Tennessee Historical Commission
TL	transmission line
TN	Tennessee
TN-QHP	Tennessee Qualified Hydrologic Professional
TT	transfer trip
TVA	Tennessee Valley Authority
UGB	Urban Growth Boundary
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WWC	wet weather conveyance

CHAPTER 1

1.0 INTRODUCTION

The Tennessee Valley Authority (TVA) has entered into a Power Purchase Agreement (PPA) with SR Millington II, LLC (SR Millington II), a wholly owned subsidiary of Silicon Ranch Corporation (SRC) in Shelby County, Tennessee (TN), subject to the successful completion of applicable environmental reviews. The long-term PPA would provide for TVA's purchase of electric power generated by the solar photovoltaic (PV) facility for 20 years. To fulfill the PPA, SR Millington II proposes to develop a solar PV facility to the east of Bethuel Road, west of Big Creek Drainage Canal, south of Kerrville-Rosemark Road, and north of Millington Arlington Road (Figure 1).

The project site for this Environmental Assessment (EA) is a 957-acre property. The proposed facility would occupy approximately 472 acres of the 957-acre property (Figure 2). While design of the facility is in the process of being finalized, the conceptual plan includes monofacial solar modules comprised of approximately 227,682 individual panels arranged over the roughly 472 acres. The proposed facility was designed to avoid cultural resources and minimize direct impacts to natural resources. The land would be acquired by SRC and leased to SR Millington II for the project. Under the PPA, SR Millington II would fund, build, own, and operate the solar energy facility.

The proposed facility would have an alternating current (AC) generating capacity of 74.9 megawatts (MW) and would tap the existing Millington Solar, TN 161-kilovolt (kV) substation tap line on the Shelby – Drummonds 161-kV transmission line (TL). The project would consist of multiple parallel rows of PV panels on single-axis tracking structures, direct current (DC) to AC inverters, and approximately 27 transformers. TVA would construct a short line to serve Millington II at the determined interchange point, southwest of the SR Millington II project site at the intersection of Bethuel Road and Center College Road. The panels would face 60 degrees east and track the sun throughout the day until they face 60 degrees west at sunset. The PV panel surface material would be a smooth glass with an anti-reflective (AR) coating.

1.1 PURPOSE AND NEED FOR ACTION

TVA is a corporate agency of the United States and the largest public power provider in the country. Through their partnership with 153 local power companies, TVA supplies energy across 80,000 square miles for 10 million people, 750,000 businesses, and 56 large industrial customers, including military installations and the U.S. Department of Energy facilities at Oak Ridge, TN. TVA's service area includes parts of seven southeastern states called the Tennessee Valley.

TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. The 2011 TVA Integrated Resource Plan (IRP) (Tennessee Valley Authority [TVA], 2011) established the goal of increasing its renewable energy-generating capacity by 1,500 to 2,500 MW by 2020. The IRP identified the various resources that TVA intends to use to meet the energy needs of the TVA region over the 20-year planning period while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy and reduce environmental impacts. TVA's 2015 IRP (TVA, 2015) reinforced the continued expansion of renewable energy-generating capacity, including the addition of between 175 and 800 MW (AC) of solar capacity by 2023.

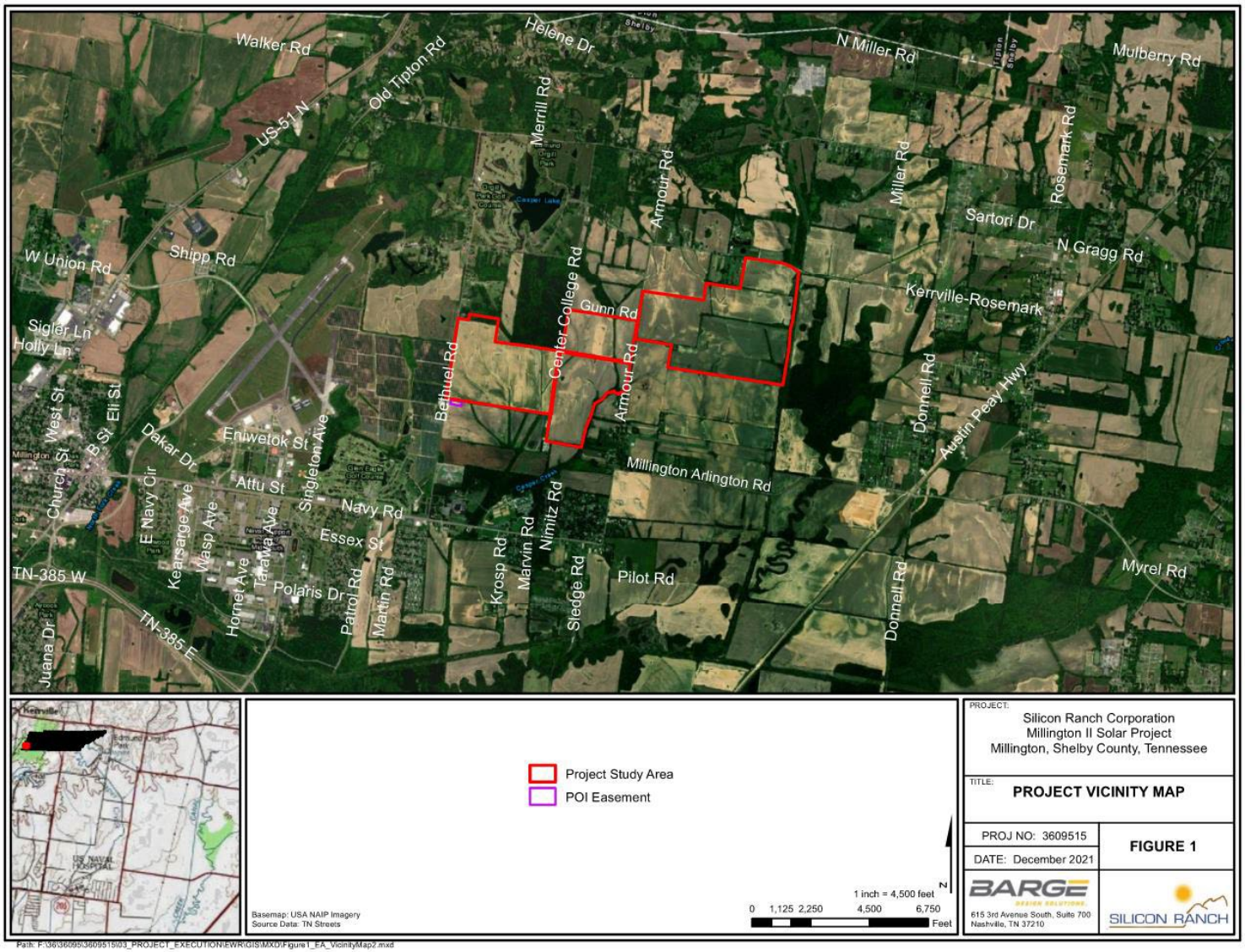

Figure 1. Millington II - Vicinity Map

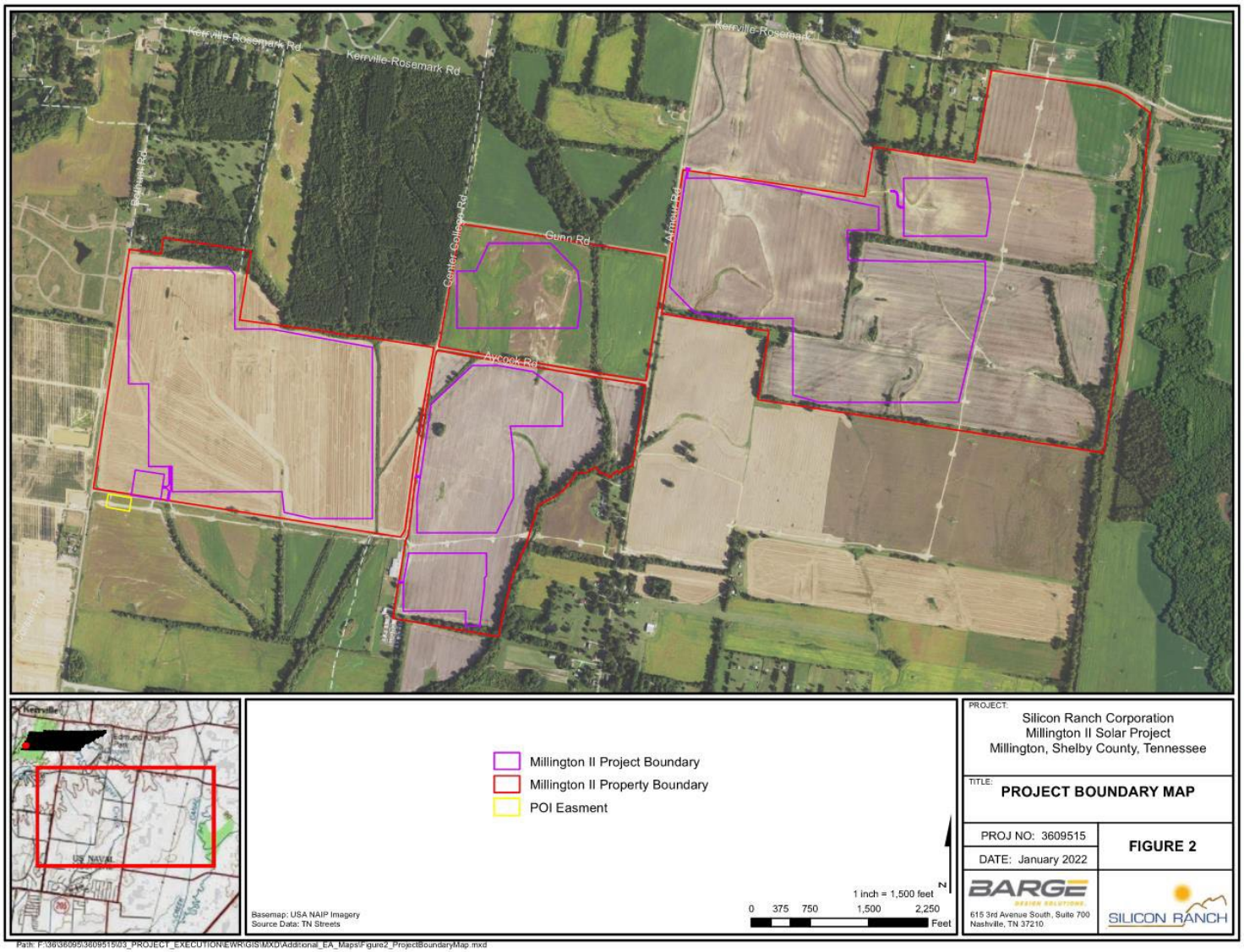

Figure 2. Millington II – Project Site

In June 2019, TVA released the final 2019 IRP and the associated Environmental Impact Statement (EIS) (TVA, 2019). This updated IRP provides further direction on how TVA would deliver clean, reliable, and affordable energy in the Tennessee Valley over the next 20 years, and the associated EIS describes the natural, cultural, and socioeconomic impacts associated with the IRP. The 2019 IRP recommends solar expansion and anticipates growth in all scenarios analyzed, with most scenarios anticipating 5,000-8,000 MW and one anticipating up to 14,000 MW by 2038 (TVA, 2019).

In 2020, customer demand prompted TVA to release a Request for Proposal (RFP) for renewable energy resources. The PPAs that resulted from this RFP (including the SR Millington II PPA) would help TVA meet immediate needs for additional renewable energy-generating capacity in response to customer demands and fulfill the renewable energy goals established in the 2019 IRP. The Proposed Action would provide cost-effective renewable energy consistent with the 2019 IRP and TVA goals.

1.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This EA was prepared consistent with 2020 Council on Environmental Quality's (CEQ) regulations for implementing NEPA at 40 CFR 1500-1508 (85 Federal Register [FR] 43304-43376, July 16, 2020). TVA's 2020 NEPA regulations at 18 CFR 1318 were also applied (85 FR 17434, Mar. 27, 2020). Further, the EA is consistent with CEQ's recently finalized rule (87 FR 23453, April 20, 2022) amending certain provisions of its 2020 regulations.

TVA's Proposed Action, including connection to the existing substation southwest of the project site, would result in the construction and operation of the proposed solar facility by SR Millington II. This EA evaluates the potential impacts of TVA's Proposed Action (construction and operation of the proposed solar facility by SR Millington II) and potential impacts related to the construction and operation of the proposed project.

TVA's commitment to purchase renewable power is contingent upon the satisfactory completion of an appropriate environmental review and TVA's determination that the Proposed Action would be "environmentally acceptable." To be deemed "environmentally acceptable," TVA must determine that the project would not result in significant impacts to the human environment and is consistent with applicable federal, state, and local environmental laws and regulations. As part of this process, TVA must evaluate potential impacts resulting from the proposed project's location, operation, and/or maintenance and determine if the project is consistent with the purposes, provisions, and requirements of applicable federal, state, and local requirements.

Chapter 1 introduces the project and details the scope of the EA. Chapter 2 presents the alternatives and proposed mitigation. Chapter 3 details the affected environment, environmental consequences, and the potential cumulative impacts of implementing the project.

Considering the proposed project and identification of applicable laws, regulations, executive orders (EO), and policies, the following resources are discussed and analyzed in this EA: land use; geology, soils, and prime farmland; water resources; floodplains; biological resources; visual resources; noise; air quality and greenhouse gases (GHGs); cultural resources; solid and hazardous wastes; public and occupational health and safety; transportation; and socioeconomics and environmental justice. Because there are no navigable waterways in the project site, navigation was not discussed in further detail.

1.3 PUBLIC AND AGENCY INVOLVEMENT

Copies of the draft EA were provided to government agencies and individuals who indicated an interest in the Project. TVA notified interested federally-recognized Native American Tribes, elected officials, and other stakeholders that the draft EA was available for review and comment for a 30-day period. An electronic version of the document was posted on the TVA website where comments could also be submitted online. Public notices were published in local newspapers soliciting comments from other agencies, the general public, and any interested organizations.

During the 30-day public review and comment period of the draft EA, a total of six responses from the general public and Tennessee Department of Environment and Conservation (TDEC) were received. The comments and responses are included as Appendix A. Comments that required revisions are referenced in this Final EA. In addition, SR Millington II would speak with community members and adjacent property owners about the proposed solar facility and answer questions as part of the county permitting process.

1.4 REQUIRED PERMITS AND LICENSES

The proposed project would require an individual stormwater construction permit (CGP), including a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would include implementation of approved pollution prevention measures. In addition, proposed permanent wetland and stream impacts and temporary stream impacts would require an authorization from TDEC (Section 401 of the Clean Water Act (CWA) Aquatic Alterations Resource Permit (ARAP) and the U.S. Army Corps of Engineers (USACE) (Section 404 of the CWA, Nationwide Permit (NWP)) SR Millington II would obtain appropriate building, floodplain development, and electrical permits from the Shelby County Building Department and other local entities. If open burning is determined to be the best method for wood waste management, a burn permit would be obtained through the Tennessee Department of Agriculture, Division of Forestry, and TDEC would be notified. While SR Millington II construction access is expected to be from four locations on Center College Road and one location on Armour Road, all potential areas have been included in the environmental review.

CHAPTER 2

2.0 DESCRIPTION OF THE ALTERNATIVES

As part of the environmental review, the EA analyzes and compares potential impacts related to each considered alternative. This chapter focuses on the background and understanding of the evaluated alternatives by providing a description of each alternative, a comparison of these alternatives with respect to their potential environmental impacts, and identification of the Preferred Alternative.

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

2.1 NO ACTION ALTERNATIVE

The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative can be measured. Under this alternative, TVA would not purchase power through a 20-year PPA with SR Millington II. The solar facility would not be constructed and operated by SR Millington II. Existing conditions, i.e., natural resources, visual resources, physical resources, and socioeconomics, would remain unchanged within the project site. The identified land would not be developed into a solar facility, and TVA would rely on other energy sources to meet energy supply needs and to meet TVA's renewable energy goal described in the 2019 IRP.

2.2 PROPOSED ACTION ALTERNATIVE

The Proposed Action Alternative would include the installation and operation of a 74.9 MW AC solar facility, as well as its connection to the TVA power system, in Shelby County, Tennessee. TVA would purchase energy generated by the solar panels under a 20-year PPA with SR Millington II. Implementing this alternative would help TVA meet future energy demands on the TVA system and generate renewable energy to help meet TVA’s renewable energy goals.

The proposed project would be developed on a 957-acre project site, covering 11 parcels, in Shelby County, Tennessee. While the design is in the process of being finalized, the conceptual plan includes monofacial solar modules (horizontal single axis) comprised of approximately 227,682 individual panels arranged over roughly 472 acres. The Proposed Action Alternative would include an overhead TL connecting the proposed 161-kV TL to the TVA system. TVA proposes to tap the existing Millington Solar, TN 161-kV substation tap line on the Shelby-Drummonds 161-kV TL. TVA would construct a short line to serve Millington II. Additional details related to the interconnection easement construction are provided in 2.2.2, Electrical Interconnection.

2.2.1 Solar Facility

The Proposed Action Alternative would result in installing approximately 227,682 individual solar panels arranged over roughly 472 acres of the 957-acre project site. The solar arrays would be supported by steel piles which would be driven into the ground to a depth of six to nine feet. Onsite sedimentation basins would be shallow and, to the extent feasible, utilize the existing terrain without requiring extensive excavation. The PV panels would be connected with underground wiring placed in trenches. Internal access roads are proposed to provide access for maintenance and inspections. Figure 3 below provides the overall site layout for the Proposed Action Alternative.

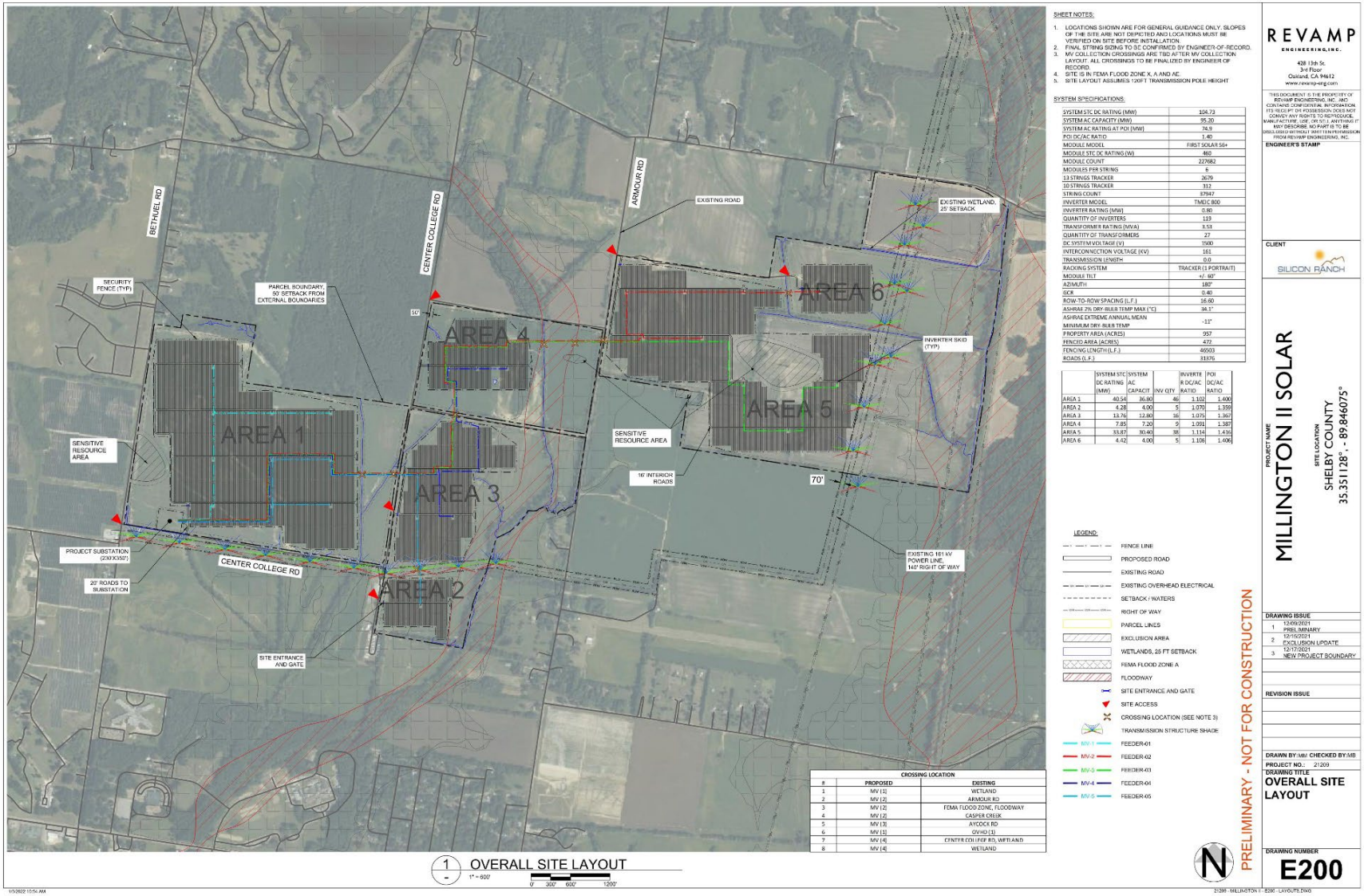

Figure 3. Millington II – Conceptual Layout

The solar arrays utilized for the proposed facility would be composed of multiple monocrystalline PV modules or panels. PV power generation is the direct conversion of light into electricity at the atomic level. Some materials exhibit a property known as the photoelectric effect that causes them to absorb photons of light and release electrons. When these free electrons are captured, an electric current is produced which can be used as electricity (TVA, 2014). The proposed facility would convert sunlight into DC electrical energy within monocrystalline PV panels (Figure 4)

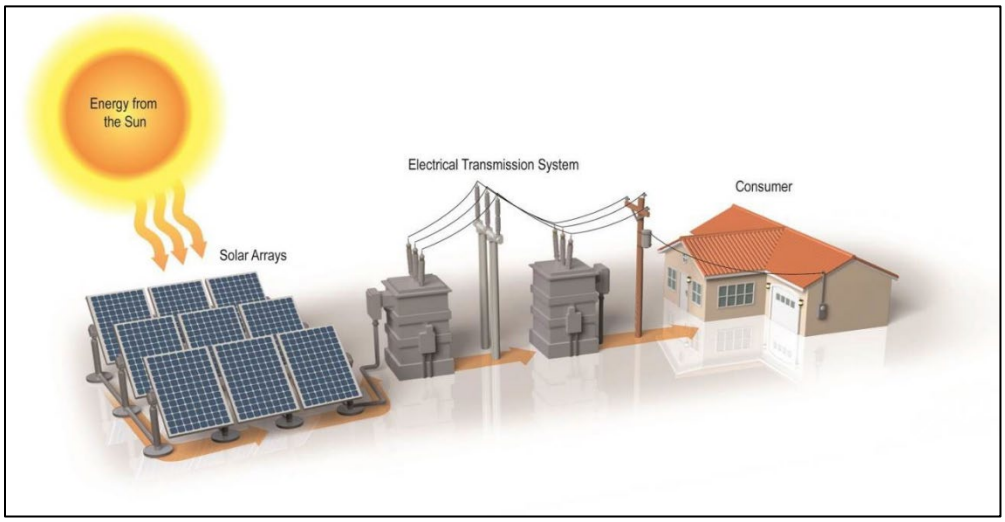

Figure 4. General energy flow diagram of PV solar system (not to scale)

The Millington II solar facility would be composed of approximately 227,682 PV panels, each capable of producing approximately 445 watts, mounted together in arrays (Figure 3). The arrays would connect to 119 power inverters that are 1500V each to convert the DC electricity generated by the solar panels into AC electricity and 27 transformers that are 4.00-mega volt amp (MVA) each for the project's electrical collection system. SR Millington II would install a 161-kV substation with one three-winding transformer to connect approximately 74.9 MW of solar generation to the TVA system.

The PV panels would be mounted on motor-operated axis tracker structures, commonly referred to as single-axis trackers. The axis trackers would be designed to pivot the panels along their north-south axes to follow the sun's path from the east to the west across the sky. The tracker assemblies would be constructed in parallel north-south rows using steel piles installed using a hydraulic ram to a depth of six to nine feet below grade (Figure 5).

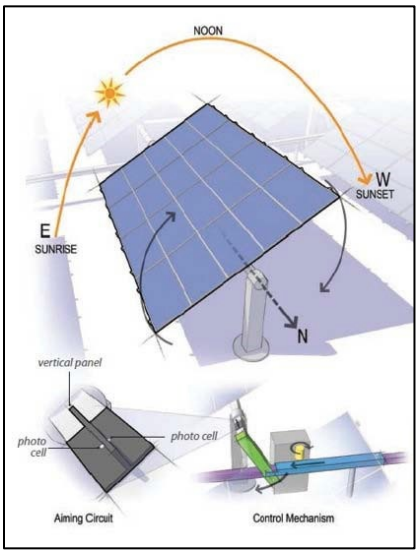

Figure 5. Diagram of single axis tracking system (not to scale)

The PV modules would be electrically connected in series (called a "string") by wire harnesses that conduct DC electricity to combiner boxes. Each combiner box would collect power from strings of modules and feed a power conversion station via cables placed in excavated trenches. The excavated trenches would be approximately two to three feet deep and one to two feet wide. Each trench would be backfilled with project-site native soil and then appropriately compacted. Aboveground cables would be used to connect the modules to

harnesses that lead wiring to combiner boxes. The AC power from each inverter would be connected to the transformer. The underground voltage collection circuits would deliver AC electricity from the transformer to the TVA system.

The arrays would contain 119 inverters and approximately 2,675 13-string trackers and 316 10-string trackers. Buried electrical cables would connect the rows of PV panels to 1,500V power inverters, each connecting to a pad-mounted 4.00 MVA transformer on site. The buried cables would be linked together in series from each transformer to the point of interconnection. As described above, all trenches for buried cables on the site would be backfilled with native soil, and the ground surface would be returned to its original grade. The project would connect to the existing Millington Solar, TN 161-kV substation tap line on the Shelby-Drummonds 161-kV TL (L5852). TVA would construct and maintain a short line to serve Millington II at the determined interchange point using a 954,000 ACSR conductor or equivalent. TVA would install a new three-pole dead-end structure between Structures 542 and 541 in the existing Millington tap line. The energy produced from the 74.9 MW AC site would be sold to TVA.

2.2.2 Electrical Interconnection

The Interconnection Customer (IC), SR Millington II, would install a 161-kV substation with one 3 winding transformer to connect approximately 74.9 MW of solar generation to the TVA system. The transformer would have back-to-back devices, circuit switchers, or breakers for high side protection. TVA would install redundant relays at the new solar site, locate the local relays in the IC-owned switch house, and provide a prewired outdoor metering cabinet for the IC to install. The IC would provide station service for TVA equipment and provide a backup station service that would be available when the TVA source is not available. At the existing TVA Shelby, TN 500-kV substation, TVA would install telecommunications equipment as required to send transfer trip (TT) from Shelby to Millington II stations.

To support the Millington II Solar facility, TVA proposes to tap the existing Millington Solar, TN 161-kV substation tap line on the Shelby – Drummonds 161-kV TL (L5852). TVA would construct an approximately 210-foot line to serve Millington II at the determined interchange point using a 954,000 ACSR conductor or equivalent. TVA would install a new three-pole dead-end structure between Structures 542 and 541 in the existing Millington tap line (L5852) right-of-way (ROW). No additional ROW would be acquired. New switches would be installed at the Millington II Solar substation pulloff. Existing fiber from Shelby, TN 500-kV substation to Millington Solar, TN 161-kV substation would be utilized. New fiber would be installed from an existing splice case to the proposed Millington II Solar station.

2.2.3 Construction

Construction of the solar power facility generally requires site preparation (surveying and staking, removal of tall vegetation and small trees, light grading and clearing, installation of security fencing, installation of erosion control Best Management Practices (BMPs), and preparation of construction laydown areas) before solar array assembly and construction, which includes driving steel piles for the tracker support structures, installing solar panels and electrical connections, and system testing and verification. Tree removal would occur from October 15 to March 31.

Construction access is expected to be from four locations on Center College Road and one location on Armour Road. These access points have been included in the environmental review.

Appropriate BMPs would be implemented and maintained during the construction and operation of the facility. SRC's standard practice, which SR Millington II would use, is to work with the existing landscape (e.g., slope, drainage, utilization of existing roads) where feasible to minimize or eliminate grading work to the greatest extent possible. Any required grading activities would be performed with portable earthmoving equipment, resulting in a consistent slope to the land. Prior to grading, native topsoil would be removed from the area to be graded and stockpiled onsite for redistribution over the disturbed area after the grading is completed. Silt fences, sedimentation basins, and other appropriate controls would be used as needed to minimize exposure of soil and to prevent eroded soil from leaving the work area. Disturbed areas would be seeded using a pollinator friendly seed mix obtained from a reputable seed dealer and in compliance with the requirements established by the Natural Resources Conservation Service (NRCS) local office. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the preconstruction conditions or the site is permanently stabilized. Water would be used for soil compaction and dust control during construction.

Grading would consist of the excavation and compaction of earth to meet the final design requirements. Limited to no grading is expected at the project location as the site is relatively flat and would not require any offsite or onsite hauling. Chipping and spreading of minimal debris from tree clearing on the site would occur to minimize construction wastes. Only vegetation and untreated wood would be burned. No burning of other construction debris is anticipated. If open burning is determined to be the best method for wood waste management, a burn permit would be obtained from the Tennessee Department of Agriculture and Division of Forestry. TDEC would be notified, and any additional permits needed to comply with local, state, and federal permitting requirements would be obtained. Per TDEC erosion and sediment control requirements, a minimum 30-foot buffer width surrounding all streams and wetlands would be established as an avoidance measure prior to any clearing, grubbing, or grading activities conducted by the construction contractor (TDEC, 2012). To meet the buffer requirements for TDEC, the streams and identified surface waters in the eastern portion of the project site (draining to the Big Creek Drainage Canal) require a 60-foot buffer. The streams and identified surface waters in the western portion of the project site (draining to Casper Creek) require a 30-foot buffer. Once sensitive areas are marked, construction areas would be mowed and cleared of vegetation and miscellaneous debris. Mowing would continue as needed to contain growth during construction.

Under the Proposed Action Alternative, SR Millington II would clear approximately 14 acres of trees within the 957-acre project footprint to accommodate the proposed solar facility and reduce shading on the panels. Non-mechanical tree clearing is proposed within stream buffers to accommodate the Proposed Action Alternative. Stumps would be left in place to reduce ground disturbance within the buffer areas. The SWPPP would reflect the proposed tree clearing, including a justification for impact and proposed erosion and sediment control measures to maintain water quality. An interior access road would permanently impact one unnamed perennial stream (STR-11). The proposed feeder lines would temporarily impact four streams. The fill for the proposed on-site substation would permanently impact one wetland (WTL-2). No tree clearing in wetlands or wetland buffers is proposed. No chipping or spreading of debris would occur within the wetland areas.

Stormwater BMPs would minimize sediment from entering onsite streams and wetlands and prevent sediment migration offsite. To manage stormwater during construction, sediment traps and erosion control silt fences would be utilized. Avoided wetlands, streams and associated 30-

foot and 60-foot buffers would be protected by erosion control silt fences, and sediment traps would be placed in strategic drainage areas to prevent sediment from entering onsite wetlands. Erosion control silt fences would protect stream buffers. Sediment traps would be placed in strategic drainage areas to prevent sediment from entering the streams. One water crossing (Stream 11) for an interior access road and some electrical conduit installations are anticipated. Silt fences placed around the entire area to be cleared would minimize offsite sediment migration.

An on-site construction assembly area (laydown area) would be required for worker assembly, vehicle parking, and material storage during construction. A temporary construction trailer, used for material storage and office space, would be parked on site. Following completion of construction activities, all trailers, unused materials, and construction debris would be removed from the site. No operations and maintenance buildings or other permanent structures would be on site.

Construction would be sequenced to minimize the time that bare soil on the disturbed areas is exposed. As described above, silt fences would surround the perimeter of the development footprint to be cleared and graded. Other appropriate controls such as temporary cover would be used as needed to minimize soil exposure and prevent eroded soil from leaving the work area. Disturbed areas including but not limited to road shoulders, laydown areas, ditches, and other project-specific locations would be seeded post-construction. If conditions require, soil would be stabilized by mulch or seed. Where required, hay mulch would be applied at three tons per acre and well distributed over the area. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the preconstruction conditions or the site is considered permanently stable. As part of NPDES permit authorization (see Section 1.4), a site-specific SWPPP would be finalized with the final grading and civil design and would address all construction-related activities prior to construction commencement.

The design of the tracker support structures could vary depending on the final PV technology and vendor selected. Typical installations of this type are constructed using steel support piles. The driven steel pile foundation is typically galvanized and used where high load-bearing capacities are required and would be driven with a hydraulic ram machine. Soil disturbance is restricted to the pile insertion location with temporary disturbance from the hydraulic ram machinery, which is about the size of a small tractor.

Solar panels would be manufactured offsite and shipped to the site ready for installation. If concrete pads are required for the drive motors, they would be precast and brought to the site via flatbed truck. Once most components are placed on their respective foundations and structures, electricians and other workers would run electrical cabling throughout the solar field.

The proposed project would connect to the existing Millington Solar, TN 161-kV substation tap line on the Shelby-Drummonds 161-kV TL (L5852). TVA would construct and maintain a short line to serve Millington II at the determined interchange point using 954,000 ACSR conductor or equivalent. TVA would install a new three-pole dead-end structure between Structures 542 and 541 in the existing Millington tap line. After the equipment is electrically connected, electrical service would be tested, and motors and their controllers would be checked. As the solar arrays are installed, the balance of the facility would continue to be constructed and installed, and the instrumentation would be installed. Once all the individual systems have been tested, integrated testing of the project would occur.

Within the 957-acre solar facility site, the 472-acre area containing the solar arrays and associated electrical infrastructure would be securely fenced with 7-foot-high chain-link fencing with three strands of barbed wire on the top throughout construction and the operation of the project. The proposed electrical connection would be located on the southwest side of the site, along Center College Road. The proposed TL would not be fenced.

Construction activities would take approximately 12 months to complete using a crew of approximately 250 people at the peak of construction. Work would generally occur six days per week (Monday through Saturday) from 7 am to 5 pm. Additional hours could be necessary to make up schedule deficiencies or to complete critical construction activities.

2.2.4 Project Operations

During operation of the solar facility, minor disturbances could occur to soils. Routine maintenance would include periodic motor replacement, inverter air filter replacement, fence repair, vegetation control, and periodic array inspection, repairs, and maintenance. Site vegetation for the Proposed Action Alternative would be maintained with a combination of grazing animals and mechanical equipment, to comply with SRC's vegetation management Scope of Work (SOW), allowing for safe and efficient operation of the power plant. Traditional trimming and mowing would be performed four to five times per year during the March to October growing season to maintain the vegetation at a height ranging from six inches to two feet. SR Millington II reserves the right to use herbicides as needed, to maintain safe working conditions at the site and to protect/maintain site infrastructure. Typically, herbicide applications would be limited to broadleaf control along fence lines and bare ground spray around inverters and substations. Products would be used as needed to control noxious weeds per local, state, and federal regulations and would be applied by a professional contractor. To minimize any possibility of runoff or drift when using herbicides, care would be taken to follow manufacturer's directions and avoid herbicide application prior to predicted rainfall events or high winds.

No major physical disturbance would occur as a result of facility operation. Moving parts of the solar facility would be restricted to the east-to-west facing tracking motion of the solar modules, which amounts to a movement of less than a one-degree angle every few minutes. This movement would barely be perceptible. In the late afternoon, module rotation would start to backtrack west to east in a similar slow motion to minimize shading. At sunset the modules would track to a flat stow position. Otherwise, the PV modules would simply collect solar energy and transmit it to TVA distribution system. Except for fence repair, vegetation control, and periodic array inspection, repairs, and maintenance, the facility would require relatively little human activity during operation. No water or sewer service or permanent lighting would be required on site during operations.

The project site would not be staffed during operation. However, the site would be inspected daily. In the case of equipment failures, staff would respond as soon as possible. At these times, up to four people would be on site for up to four days.

The site vegetation would be maintained with a combination of grazing animals and mechanical equipment, to comply with SRC's vegetation management SOWs, allowing for safe and efficient operation of the power plant. In general, it is expected that four to five vegetation management events would occur during the March to October growing season. SRC reserves the right to use herbicides as needed, to maintain safe working conditions at the site and to protect/maintain site infrastructure. Typically, herbicide applications would be limited to broadleaf control along fence

lines, and bare ground spray around inverters and substations. If SR Millington II C decides to self-perform vegetation management, full time staff would be onsite. Further, to minimize any possibility of runoff or drift when using herbicides, care would be taken to follow manufacturer's directions and avoid herbicide application prior to predicted rainfall events or high winds.

Maintenance would be required biannually. This includes drawing transformer oil samples and identifying physical damage to panels, wiring, and interconnection equipment and one annual powerwash. Precipitation in this region is adequate to remove dust and other debris from the PV panels while maintaining energy production. However, to ensure panel performance does not decrease due to buildup of dust and debris, all panels would be power washed one time per year. Power washing would require approximately 84,000 gallons of water based on the use of approximately 4,500 gallons per 12,000 modules using the wash machine. SR Millington II would obtain water from nearby water sources such as wells or hydrants. If no local sources are available, SR Millington II would truck water to the site.

The proposed project facility would be monitored remotely to identify any security or operational issues. If a problem is discovered during nonworking hours, a repair crew or law enforcement personnel would be contacted if an immediate response was warranted.

2.2.5 Decommissioning and Reclamation

Following the expiration of the 20-year PPA with TVA, SR Millington II would reassess the site operation and determine whether to cease operation or attempt to enter into a new PPA or other arrangement. If TVA or another entity is willing to enter into such an agreement, the facility would continue operating. If additional PPA terms are arranged with TVA, these activities would be evaluated through a separate NEPA review.

If no commercial arrangement is possible, the facility would be decommissioned and dismantled, and the site restored. In general, most of the decommissioned equipment and materials would be recycled. Materials that could not be recycled would be disposed of at approved facilities. SR Millington II would develop a decommissioning plan to document recycling and disposal of materials in accordance with applicable local, state, and federal laws and regulations.

2.3 COMPARISON OF ALTERNATIVES

This EA evaluates the potential environmental effects that could result from implementing the No Action Alternative or the Proposed Action Alternative at the proposed solar facility in Shelby County, Tennessee. The analysis of impacts in this EA is based on current and potential future conditions on the property and within the surrounding region. The summary and comparison of impacts by alternative for each resource area evaluated are provided in Table 1.

Table 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	No significant adverse impacts are anticipated. Following decommissioning of the solar facility, a large portion of the site could return to previous agricultural use or could be used for other development depending on zoning ordinances in effect at that time.
Geology, Soils, and Prime Farmland	No impacts anticipated	Geology and Soils: Minor direct impacts to geology and soils, resulting from minor to minimal increases of erosion and sedimentation are anticipated during construction. While in operation, minor adverse impacts to soils would be offset by beneficial effects of vegetative management.
		Prime Farmland: Minimal direct and indirect impacts to prime farmland are anticipated; no permanent or irreversible conversion of farmland would occur.
Water Resources	Minor impacts anticipated	Groundwater: No direct adverse impacts are anticipated; minor beneficial indirect impacts to groundwater due to reduction in fertilizer and pesticide agricultural use for the duration of the project.
		Surface Waters and Wetlands: Minor indirect impacts to water resources could occur from stormwater runoff during construction. One permanent impact to a stream may be required to accommodate a proposed interior access road. Approximately 0.08-acre permanent direct wetland impact is anticipated for construction of access road to the substation on-site. Four temporary stream crossing impacts would be required to accommodate the proposed feeder lines.
		Floodplains: With implementation of mitigation measures, there would be no significant impact on floodplains and their natural and beneficial values.
Biological Resources	No impacts anticipated	Vegetation: Direct impact to vegetation by clearing up to approximately 14 acres of trees and other tall vegetation within the project area proposed for development is insignificant because disturbed areas would be revegetated of native and noninvasive species.
		Wildlife: Potential for direct impacts to some wildlife and migratory birds while temporary displacement of others that are mobile is expected during clearing and construction. Significant impacts to migratory bird populations would not be anticipated. Minor impacts on common wildlife species due to the existence of project components and increased human presence.
		Rare, Threatened, and Endangered Species: Section 7 consultation under Endangered Species Act concluded that the proposed actions may affect, but are not likely to adversely affect (NLAA) Indiana bat and northern long-eared bat.
Visual Resources	No impacts anticipated	Temporary, minor direct impacts on visual resources are anticipated during construction due to increased traffic. Visual impacts during the project's operational phase would be minor due to terrain and nearby roadways. SR Millington II would maintain existing vegetation where possible. If additional landscape buffers are required by Shelby County, SR Millington II would plant evergreen tree/shrub species in accordance with Shelby County requirements.
Noise	No impacts anticipated	Minor temporary direct impacts would occur during construction activities. Minimal to negligible impacts during operations and maintenance.
Air Quality and Greenhouse Gas Emissions	No impacts anticipated	Air quality: Minor direct impacts to air quality would occur if trees are removed during clearing and burned and during construction activities from operation of equipment. No negative impacts to air quality would be anticipated as a result of operation of the project.
		Greenhouse gas emissions: Temporary impacts to GHG emissions expected during construction would be negligible. Offsetting beneficial effects would also occur due to the near emissions free power generated by the solar facility, offsetting the need for power that would otherwise be generated by the combustion of fossil fuels.
Cultural Resources	No impacts anticipated	No direct or indirect impacts anticipated from development of the solar facility. No direct or indirect impacts to archeological sites would be anticipated with a 20-meter buffer avoidance of the three recommended NRHP undetermined sites and Saint James Cemetery.

Solid and Hazardous Wastes	No impacts anticipated	Minor adverse impacts anticipated from development of the solar facility. Construction waste generated during construction activities would be directed to local landfills. Hazardous wastes would be handled, stored, and disposed of in accordance with the SWPPP and applicable state and federal laws and regulations. Impacts during system operation would be negligible through implementation of a recycling program. No adverse effects to waste management would be anticipated with the use of BMPs.
Public and Occupational Health and Safety	No impacts anticipated	Minor temporary adverse impacts during construction. No adverse effects would be anticipated with the use of BMPs. No public health or safety hazards would be anticipated as a result of the operation.
Transportation	No impacts anticipated	Minor temporary adverse impact during construction. No direct impacts to operation of the Millington-Memphis Airport or ground transportation are anticipated during operation. No indirect impacts to transportation are anticipated as a result of the operation.
Socioeconomics and Environmental Justice	No impacts anticipated	Socioeconomics: Minor beneficial direct, indirect, and cumulative impacts during construction and operation and maintenance activities by creation of local jobs and potential for expansion of future solar energy systems into the region.
		Environmental Justice: No disproportionately adverse impacts are anticipated to minority or low-income populations.

2.4 MITIGATION MEASURES

SR Millington II would implement the following routine minimization and mitigation measures in relation to resources potentially affected by the proposed project:

- Install anti-reflective, PV panel surfaces to minimize potential for visual impacts such as glare and reflection
- Maintain existing landscape buffers where possible. If additional buffers are required by Shelby County, SR Millington II would install landscape buffers along the project site boundary to minimize visual impacts from the proposed solar facility
- Comply with the terms of the SWPPP prepared as part of the NPDES permitting process and implement other routine BMPs, such as non-mechanical tree removal within surface waters and the 30- and 60-foot buffers, placement of silt fences and sediment traps along buffer edges, and proper vehicle maintenance to reduce the potential for adverse impacts to groundwater
- Design of the final layout would minimize direct impacts to aquatic features
- Comply with the conditions of the TDEC ARAP permit (Section 401 of CWA) and USACE 404 of the CWA (33 U.S.C. § 1251 et seq.) permit, as applicable
- Limit tree clearing to October 15 through March 31, when federally listed bat species are not present on the landscape in Tennessee in accordance with commitments outlined in the April 25, 2022 Endangered Species Act Section 7(a)(2) concurrence letter from the U.S. Fish and Wildlife Service (USFWS) (completed)
- Should traffic flow be a problem for local developments, SRC would consider staggered work shifts to space out the flow of traffic to and from the project site. Use of such mitigation measure would minimize potential adverse impacts to traffic and transportation to less than significant levels
- Maintain a 20-meter buffer around identified cultural resource sites
- Standard BMPs would be used
- Any road crossings within the 100-year floodplain would be done in such a manner that upstream flood elevations would not be increased by more than 1 foot

- If hauled offsite for disposal, excavated material and debris whenthe facility is decommissioned and dismantled would be spoiled outside the 100-year floodway
- Every effort would be made to keep stockpiled soil from eroding into streams
- The solar panels would be elevated at least one foot above the 100-year flood elevation

2.5 THE PREFERRED ALTERNATIVE

The Proposed Action Alternative has been identified as the Preferred Alternative. This alternative would generate renewable energy for TVA and its customers to help meet TVA's renewable energy goals. The Proposed Action Alternative would help TVA meet future energy demands on the TVA system and would meet TVA's purpose and need.

CHAPTER 3

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental, social, and economic conditions of the proposed Project Site and the surrounding areas that might be affected if the No Action or Proposed Action are implemented. This chapter also describes the potential environmental effects that could result from implementing the No Action or Proposed Action Alternatives.

3.1 LAND USE

Land use of the project site and surrounding properties has been included in the evaluation of potential impacts. This section provides a discussion of the existing land use within and surrounding the project site and potential impacts to land use associated with the No Action and Proposed Action Alternatives.

3.1.1 Affected Environment

The project site is in the Millington area of Shelby County, TN. The project site consists of 11 parcels located east of Bethuel Road, west of Big Creek Drainage Canal, south of Kerrville-Rosemark Road, and north of Millington Arlington (Figure 1). Several roads intersect the project site, including Amour Road, Center College Road, and Gunn Road.

The 11 parcels that make up the project site are detailed in Figure 6 and Table 2. The site consists of 11 parcels, all designated Conservation Agriculture (C-A) District by Shelby County, Tennessee. The C-A District is intended to conserve agricultural land and undeveloped natural amenities while preventing the encroachment of urban and incompatible land uses on farms and other undeveloped areas. A portion of Parcel D0116 00409 is zoned R-8, Single-family detached. Under the Memphis/Shelby County Unified Development Code, C-A solar farms are a permitted use. A Special Use Approval is required for solar farms on land designated as R-8.

The entire site falls within the City of Millington Urban Growth Boundary (UGB). The western portion of the site, west of Amour Road, falls within a designated Opportunity Zone. The Opportunity Zones are census tracks with a poverty rate of at least 20 percent, certified by the U.S. Department of Treasury, into which investors can make equity investments in businesses and real estate in exchange for certain federal tax benefits.

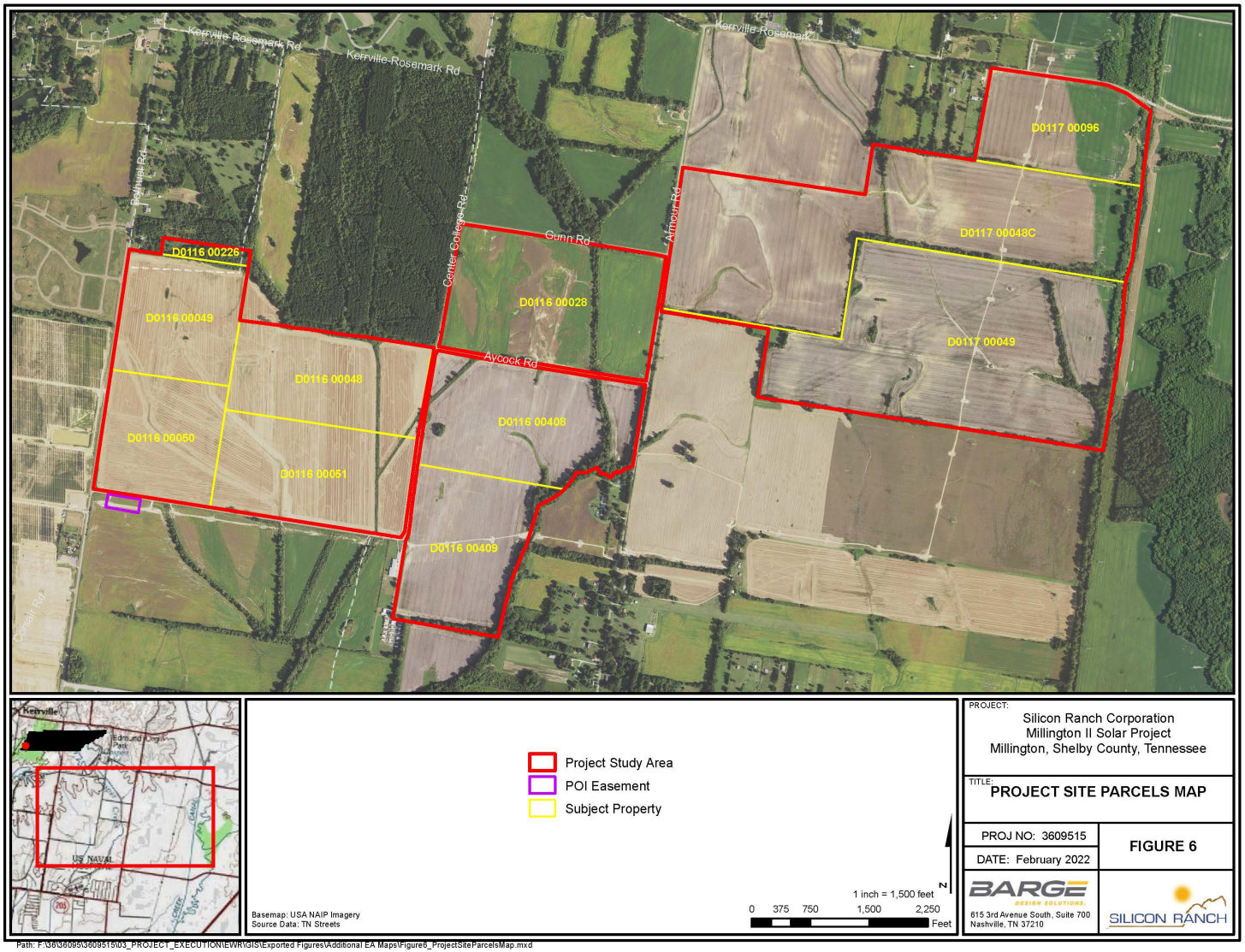

Figure 6. Project Site Parcels Map

Table 2: Project Site Parcels

Property Owner Name	Parcel Number
Thomas, Bethel Evans Jr & Rubye Lynn Dobbins	D0116 00028
Ray, Ronald B, Dianne M	D0116 00408
Rounds, Ronald and Mary Family Trust	D0116 00409
Ceres Land Management and Consulting LLC	D0116 00048
Prital, Bindra Trust FBO Angad S Bindar FBO Govin B	D011600049
Ceres Land Management and Consulting LLC	D011600050
Ritpal Bindra Trust FBO Angad S Bindra and Pritpal Binda Trust FBO Govin D	D011600051
Davis Mary Patricia D Revocable Living Trust	D011700048C
Longmire, Terry L	D0117 00049
Mccalla Frank and Jon Mccalla and Molly M Hampton and Betsy M Wiggins and Etal	D0117 00096
Prital Bindra Trust FBO Agad S Bindra and Pritpal Bindra Trust FBO Govin D	D0117 00226

Elevation on the 957-acre project site ranges between 300 and 350 above sea level. The project site is primarily used for agriculture, except for Parcel D0116 00226, located in the northwestern extent of the site, which is wooded, vacant land (Figure 6). The Saint James Cemetery is in the western portion of Parcel D0117 00049 (Figure 6). Some of the cultivated parcels have irrigation systems in place. Several surface water features, including wetlands, perennial streams, intermittent streams, ephemeral streams, and wet weather conveyances, were observed within the project site. No buildings are present within the project site.

The surrounding area includes wooded, vacant land, cultivated agricultural land, and residential properties. North of the project site, land is primarily wooded vacant, residential, and cultivated agricultural land. South of the project site, land use is primarily residential and agricultural land. Land use east of the project site is primarily cultivated agricultural land. A residential development, the Millington I Solar Facility, and the Millington-Memphis Airport are located west of the project site. There is a 39.53-acre wetlands reserve parcel located approximately 2.7 miles southeast of the project site. No other recreational areas or natural areas are within five miles of the project site.

TVA previously constructed the 5-mile Shelby-Millington Solar 161-kV TL to connect the Millington I Solar Facility to the TVA electrical transmission network. A portion of this previously constructed TL intersects the Millington II project site in various locations. The existing TL line runs from the Millington I substation, east along the south side of Center College Road, through Parcel D0116

00409, continues east, turns north before the Big Creek Drainage Canal, though the Millington II project site (parcels D0117 00049, D0117 00048C, and D0117 00096) to connect with the Shelby 500-kV substation, 0.5 miles north of Mudville Road. This easement area has been cleared and is maintained.

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be built, and the land uses of the site would not change. Existing land use would be expected to remain a mix of agricultural, forested, and rural residential for the foreseeable future.

3.1.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the development of the solar facility would result in the conversion of the site from agricultural to industrial use. The surrounding area includes wooded, vacant land, cultivated agricultural land, and residential properties, though due to its proximity to Millington and Memphis, land use may change over the next 20 years. The proposed Millington II project site is adjacent to the previously constructed and operating Millington I solar facility and approximately 0.9-mile east of the Millington-Memphis Airport. Following decommissioning of the solar facility, a large portion of the site could return to previous agricultural use or could be used for other development depending on zoning ordinances in effect at that time. The area of the project site would be owned by SRC and leased to SR Millington II.

Under the Proposed Action Alternative, Shelby County regulations require a special use permit to build solar farms. SR Millington II contacted Shelby County concerning the county permitting process in the first quarter of 2022. The permitting process is ongoing. No significant impacts to land use are anticipated as a result of the Proposed Action Alternative. Land use would be affected when the solar panels are installed as the land would no longer be used for agricultural purposes and as undeveloped land. However, if the panels were removed, the land would be useable for other purposes as the panels do not have a permanent impact on the land use. This scenario would be analogous to land use at the adjacent Millington I solar farm.

Since the TVA TL connection would occur within the previously cleared TL corridor from the Millington I solar facility, no land-use related impacts would occur from the proposed modifications. Further, since the TVA substation modifications would occur within the footprint of the existing substation, no land-use related impacts would occur from the proposed modifications.

3.2 GEOLOGY, SOILS, AND PRIME FARMLAND

Impacts to the geology, soils, and prime farmland have been included in the evaluation of the proposed actions. This section discusses the existing geology, soils, and prime farmland within the project site and potential impacts to geology, soils, and prime farmland associated with the No Action and Proposed Action Alternative.

3.2.1 Affected Environment

3.2.1.1 Geology and Geologic Hazards

The project site is in Shelby County, which is in western TN, approximately 18 miles northeast of Memphis. The project site is within the Gulf Coastal Plain physiographic province and is underlain by Quaternary-aged loess deposits. These deposits consist of clayey and sandy silt up to four feet thick within the project site.

Potentially hazardous geological conditions can include the following: landslides, volcanoes, earthquakes/seismic activity, and subsidence/sinkholes. The project site is located on relatively stable ground. No potential geologic hazards were identified. No significant slopes are present within several miles; therefore, landslides are not a potential risk. No volcanoes are present within several hundred miles of the project site.

Seismic activity at the project site could cause surface faulting, ground motion, ground deformation, and conditions including liquefaction and subsidence. The Modified Mercalli Scale is used within the United States to measure the intensity of an earthquake. The scale quantifies the effects of an earthquake based on the observed effects on people and the natural and built environment. Mercalli intensities are measured on a scale of I through XII, with I denoting the weakest intensity and XII denoting the strongest intensity. The lower degrees of the scale generally deal with the way people feel the earthquake. The higher numbers of the scale are based on observed structural damage. This value is translated into a peak ground acceleration (PGA) value to measure the maximum force experienced. The PGA is the maximum acceleration experienced by a building or object at ground level during an earthquake on uniform, firm-rock site conditions. The PGA is measured in terms of percent of “g,” the acceleration due to gravity. The United States Geological Survey (USGS) Earthquake Hazards Program publishes a seismic hazard map (Figure 6) that displays the PGA with 10 percent (1 in 500-year event) probability of exceedance in 50 years. The potential ground motion for the proposed project site is 0.23g, for a PGA with a 10 percent probability of exceedance within 50 years (USGS, n.d.).

3.2.1.2 Soils

The project site contains 14 known soil types, consisting of silt loams and sloped eroded complexes. The predominant soil on the project site is Falaya silt loam (Fm), which accounts for 51.5 percent of the project site. The second most dominant soil unit is the Grenada silt loam, 2 to 5 percent slopes (GaB), accounting for 16.3 percent of the project site. Figure 8 below shows the approximate distribution area of each soil type. Table 3 lists soils identified within the area of interest (AOI), defined as the project site and associated interconnection.

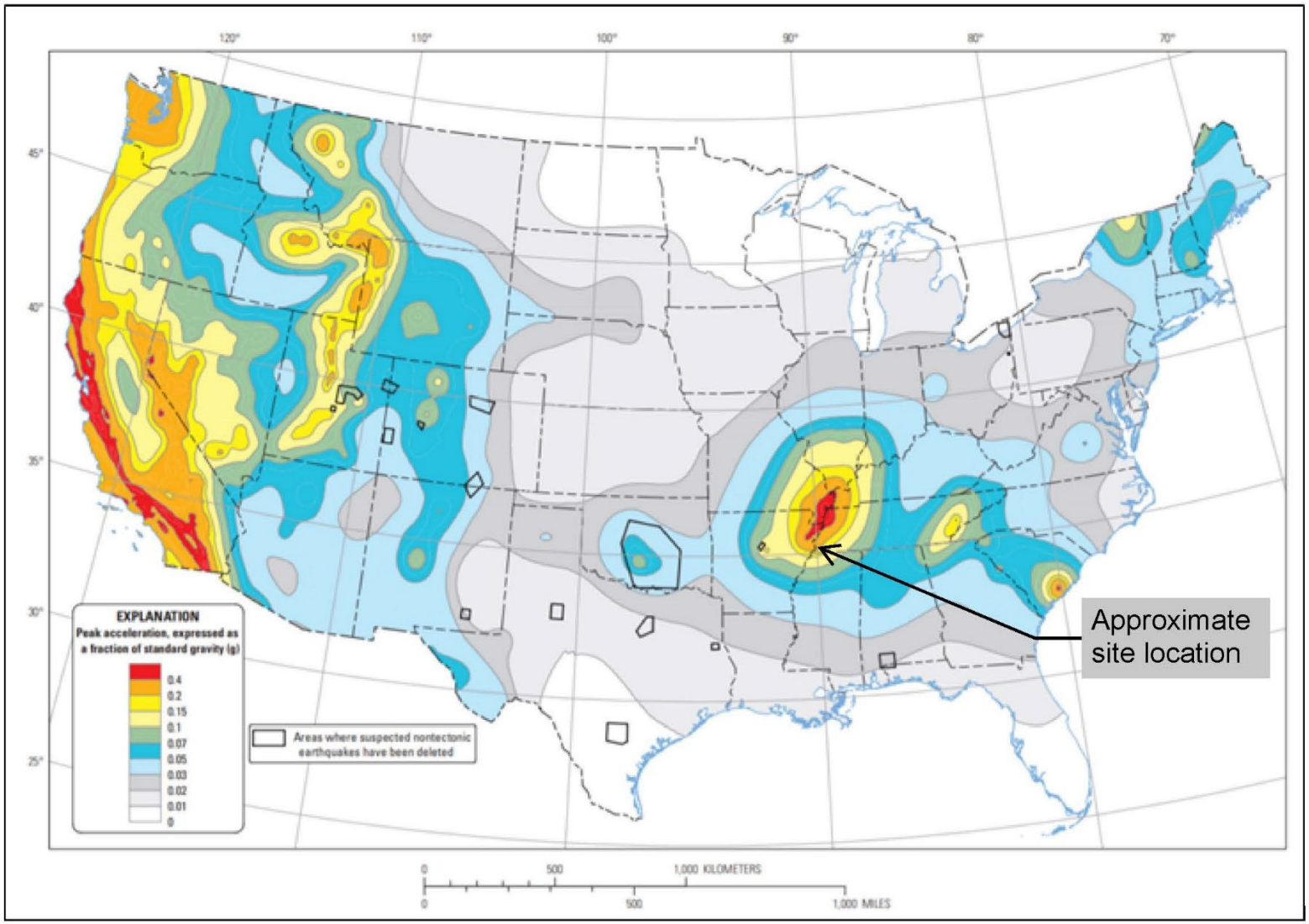

Figure 7. Ten-percent Probability of Exceedance in 50 Years Map of Peak Ground Acceleration

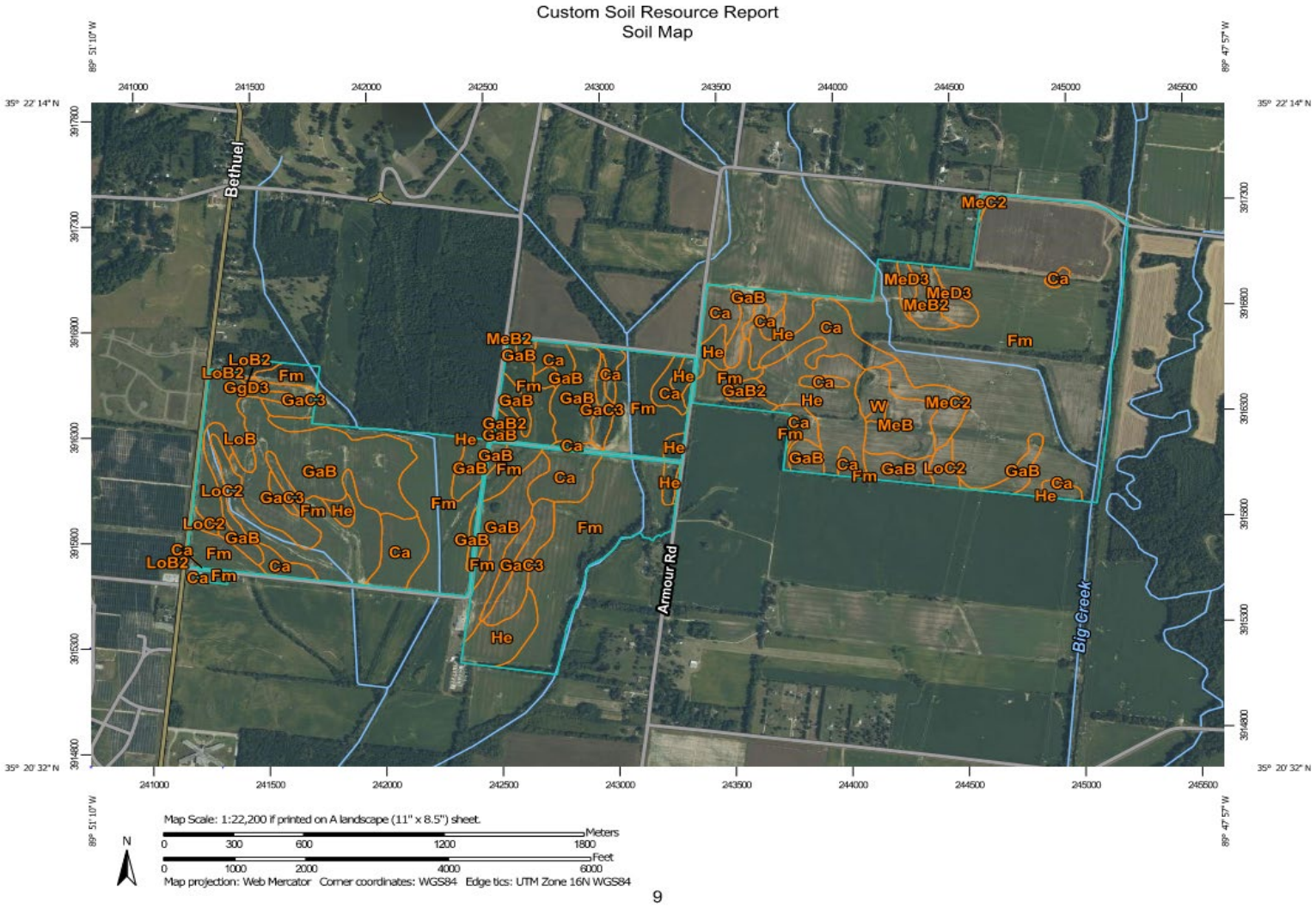

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Figure 8. Site Soil Map

Table 3. Site Soils

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ca	Calloway silt loam, 0 to 2 percent slopes	98.4	10.3%
Fm	Falaya silt loam	493.5	51.5%
GaB	Grenada silt loam, 2 to 5 percent slopes	156.4	16.3%
GaB2	Grenada silt loam, 2 to 5 percent slopes, eroded	4.3	0.4%
GaC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded	28.8	3.0%
GgD3	Grenada complex, 5 to 12 percent slopes, severely eroded	2.7	0.3%
He	Henry silt loam	75.2	7.8%
LoB	Loring silt loam, 2 to 5 percent slopes	22.9	2.4%
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded	6.8	0.7%
LoC2	Loring silt loam, 5 to 8 percent slopes, eroded	13.3	1.4%
MeB	Memphis silt loam, 2 to 5 percent slopes, northern phase	23.6	2.5%
MeB2	Memphis silt loam, 2 to 5 percent slopes, moderately eroded, northern phase	6.8	0.7%
MeC2	Memphis silt loam, 5 to 8 percent slopes, moderately eroded, northern phase	13.9	1.4%
MeD3	Memphis silt loam, 5 to 12 percent slopes, severely eroded, northern phase	10.6	1.1%
W	Water	1.3	0.1%
Totals for Area of Interest		**958.6**	**100.0%**

Source: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Below is a brief description of some of the more prominent soils identified on site:

Falaya silt loam (Fm) is a very deep, somewhat poorly drained soil. The depth to the water table is about 6 to 24 inches. The Grenada silt loam, 2 to 5 percent slopes (GaB), is a very deep, moderately well-drained soil. This soil has about 16-to-29-inch depth to the water table. Calloway silt loam, 0 to 2 percent slopes (Ca), is a deep, somewhat poorly drained soil. It has a seasonally high-water table, about 7 to 21 inches. Henry silt loam (He) consists of very deep, poorly drained soils. It has about a 6-to-15-inch depth to the water table. Grenada silt loam, 5 to 8 percent slopes, severely eroded (GaC3), is a moderately well-drained soil. The runoff class is medium, and depth to the water table is about 8 to 17 inches (USDA NRCS, n.d. -a).

Of the 14 soils identified on site, 2 soil units are considered hydric for Shelby County, TN, including Falaya silt loam (Fm) and Henry silt loam (He), and account for 51.5 percent and 7.9 percent of the project site, respectively.

3.2.1.3 Prime Farmland

Prime farmland, as defined by the U.S. Department of Agriculture (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.” (USDA NRCS, n.d. -b)

The Farmland Protection Policy Act ([FPPA]; 7 U.S.C. 4201 et seq.) requires federal agencies to minimize federal programs' impact on the unnecessary and irreversible conversion of farmland to nonagricultural uses. Prime farmland is the most suitable land for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops.

Of the 14 soils identified, 8 soil types are indicated as prime farmland, making up approximately 812.7 acres of the project site (about 84.8 percent of the onsite soils). These soils include Ca, Fm, GaB, GaB2, LoB, LoB2, MeB, and MeB2.

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no direct or indirect project-related impacts on geological, paleontological, soil resources, or prime farmlands would result. Existing land use would be expected to remain a mix of farmland and forested areas. If current land use remains unchanged, soil impacts from continued agricultural use could result from a depletion of nutrients, causing minor changes to the site.

3.2.2.2 Proposed Action Alternative

The following sections describe the anticipated impacts on geology, soils, and prime farmland should the Proposed Action Alternative be approved and implemented.

Geology and Geologic Hazards

Under the Proposed Action Alternative, minor impacts to geology could occur. The solar arrays would be supported by steel piles which would be mechanically driven into the ground to a depth of six to nine feet. Trenching to two to three feet deep and one to two feet wide would be required for underground wiring connections between solar panels. Onsite sedimentation basins would be shallow and, to the extent feasible, utilize existing terrain without requiring extensive excavation. The PV panels would be connected with underground wiring placed in excavated trenches and backfilled with project-site native soil. Due to the small sizes of the subsurface disturbances, only minor direct impacts to potential subsurface geological resources are anticipated.

As excavation would be limited, minor direct impacts to geological resources would be anticipated. Should paleontological resources be exposed during site construction (i.e., grading and foundation placement) or operation activities, a paleontological expert would be consulted to determine the nature of the paleontological resources, recover those resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy.

Ground disturbance would occur at specific locations within the interconnection easement area for the proposed TL. Due to the limited area of disturbance and shallow nature of the proposed surface disturbances, only minor impacts to geological resources are anticipated. In addition, since the TVA substation modifications would occur within the footprint of the existing substation, no geology-related impacts would occur under the Proposed Action Alternative.

Hazards resulting from geological conditions would be minor because the project site is in a relatively stable geologic setting. There is a moderate potential for small to moderate intensity seismic activity. The facility would be designed to comply with applicable seismic standards prescribed in state and local building codes. A seismic event could cause minor impacts to the project site and equipment on the site. The project could be subject to potential adverse effects from ground failure associated with liquefaction during a strong seismic event. Structural damage to PV panels, PV panel support structures, and other associated equipment could occur. Since the site would not be staffed during operation, potential damage to onsite structures would pose very limited risk to humans. Geologic hazard impacts on the site would be unlikely to impact offsite resources.

The proposed overhead connection associated with the TL would be designed to comply with applicable standards. Potential impacts from seismic activity would be minimal and unlikely to cause adverse impacts to the proposed structures. Further, modifications to the existing TVA substation would occur within the footprint of the existing substation. The seismic activity resulting from these modifications would not result in new impacts to the substation.

Soils

As part of the site preparation and development process, portions of the site would be temporarily affected during mowing and construction activities. Soils located in areas where only vegetation clearing is proposed would remain in place unless a circuit trench or foundation would be constructed.

It is unlikely that the offsite soil resources would be necessary for construction. However, if borrow materials, such as sand, gravel, rip rap, or other aggregates, are necessary during site preparation, resources may be obtained from nearby permitted offsite sources.

Minor disturbance to soils would occur during operation of the Proposed Action Alternative. The creation of new impervious surfaces, in the form of panel footings and the foundations for the inverter stations and substation, would result in a minor increase in stormwater runoff and potentially increase soil erosion. The use of BMPs such as soil erosion and sediment control measures would minimize the potential for increased soil erosion and runoff. Due to the project disturbance area being greater than one acre, an NPDES Permit for discharges of stormwater associated with construction activities would be required. Application for the permit would require submission of a SWPPP describing the management practices that would be utilized during construction to prevent erosion and runoff and reduce pollutants in stormwater discharges from the site. Following construction, implementation of soil stabilization and vegetation management measures would reduce the potential for erosion impacts during site operations.

During operation of the solar facility, minor disturbances could occur to soils. Selective use of herbicides may also be employed around structures to control weeds. Products would be applied by a professional contractor following the manufacturer’s directions to control noxious weeds per

local, state, and federal regulations. Weather events, e.g., predicted rainfall or high winds, would be considered prior to application of herbicides in efforts to reduce potential runoff or drift. These maintenance activities would not result in any adverse impacts to soils on the project site during operations.

Since the TVA substation upgrades would occur within the footprint of the existing substation, no impacts to soils would occur from the proposed modifications.

Prime Farmland

The construction and operation of the Proposed Action Alternative would result in temporary adverse effects to prime farmland. Nearly 84.8 percent, over 812 acres, of the project site soil is considered prime farmland. The majority of the solar array, which would cover approximately 428 acres within the project site, would be installed in areas identified as prime farmland.

Any area within the project site not developed for the solar facility would remain undeveloped with no agricultural or other activities, aside from general vegetation maintenance. Adhering to BMPs during construction and operation of the solar facility, including installing erosion control devices (ECDs) during stockpiling events, would preserve topsoil and limit erosion, resulting in negligible impacts to prime farmland. Due to the limited amount of grading and excavation on site, the majority of soils would remain in-situ.

Ground disturbances for the proposed TL interconnection would be temporary during construction; no loss of prime farmland is anticipated from construction of the proposed TL. Further, since the TVA substation modifications would occur within the footprint of the existing substation, no impacts to prime farmland are anticipated from the proposed modifications.

Moreover, solar projects do not result in the permanent or irreversible conversion of farmland. 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 should the solar farm be dismantled. Based on the limited site disturbance, there would be minimal direct and indirect effects on prime farmland under the Proposed Action Alternative.

3.3 WATER RESOURCES

This section provides an overview of existing water resources within the project site and the potential impacts on these water resources associated with the No Action Alternative and Proposed Action Alternatives. Water resources discussed in this section include groundwater and surface water, wetlands, and floodplains.

3.3.1 Affected Environment

3.3.1.1 Groundwater

The Mississippi embayment aquifer system is the principal aquifer that underlines the project site. This aquifer underlies parts of western Kentucky, western Tennessee, central and southeast Mississippi, and southwestern Alabama in the Coastal Plains (Eastern Gulf) Province (USGS 1995). Based on available information, there are no sole-source aquifers designated by the U.S. Environmental Protection Agency (USEPA) in Shelby County (USEPA, n.d. -a). Further, there are no groundwater data sites on the USGS National Water Information System: Web Interface. Given this, there is a potential for undiscovered groundwater contamination.

3.3.1.2 Surface Water and Wetlands

Surface waters are defined as water features typically consisting of streams, lakes, ponds, and rivers. Surface water features are further segregated as having perennial, intermittent, and ephemeral flow or inundation. TDEC also designates surface water features that do not contain an ordinary high water mark (OHWM), and would likely not be considered federally jurisdictional, as wet weather conveyances (WWCs). Perennial waters are permanent surface water features with water present throughout the year. Intermittent classification is generally restricted to streams that have a well-defined channel but only contain water part of the year, typically during winter and spring seasons when the stream bed is below the water table. Ephemeral streams (those channels that contain an OHWM and are potentially federally jurisdictional) or WWCs are features that only flow in direct response to precipitation events and typically exist as topographic swales and dry drainages with poor bed/bank development. Wetlands are those inundated by surface water or groundwater such that vegetation has adapted to saturated soil conditions (i.e., swamps, marshes, bogs).

This project site is in Shelby County and drains to waterways within the (8-digit HUC 08010209) Loosahatchie River watershed and more specifically to the Big Creek Upper (12-digit HUC 080102090301) and Big Creek Middle (12-digit HUC 080102090302) watersheds. The two main tributaries that run through the project site are Casper Creek in the center and Big Creek along the eastern boundary. Per the USEPA, Big Creek, as well its unnamed tributaries, are considered as a 303(d) listed water for impairment of *Escherichia coli*, sedimentation, channelization, and phosphorus contamination. Casper Creek remains unassessed.

Surface water features on the project site were identified by a Tennessee Qualified Hydrologic Professional (TN-QHP) during a site visit. Prior to conducting the field survey, aerial photographs, USGS topographic maps, National Wetlands Inventory (NWI) maps, and soil survey maps were consulted to identify current and historic drainage patterns of the subject property and connectivity of potential wetlands to any other jurisdictional wetlands or waters of the U.S. A field investigation was conducted to evaluate areas of potential jurisdiction using procedures established for “routine delineations” as found in the USACE 1987 Wetland Delineation Manual and with additional information as provided in the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual Atlantic and Gulf Coastal Plain Region (Version 2.0) (USACE, 2010).

Additionally, while delineating any observed wetlands, the Tennessee Rapid Assessment Method (TRAM) for wetlands was utilized to quantify each wetland’s net resource value. Each wetland was evaluated on a quantifiable score which categorized them as low, moderate, or exceptional quality (TDEC 2015). A TRAM score between 0 to 44 indicates a low-quality wetland, 45 to 74 as moderate, and 75 and above as exceptional.

Figures 8a-8g summarize environmental features located within the project site. Seven wetland features were observed within the project study area. One of these features was a partially man-made pond, or a Palustrine Unconsolidated Bottom (PUB) feature with Palustrine Forested (PFO) fringe. The remaining wetlands systems were observed as either Palustrine Emergent (PEM) or Palustrine Scrub-Shrub (PSS) wetland features. Each wetland feature was verified with the positive identification of suitable hydrology, hydrophytic vegetation, and hydric soils.

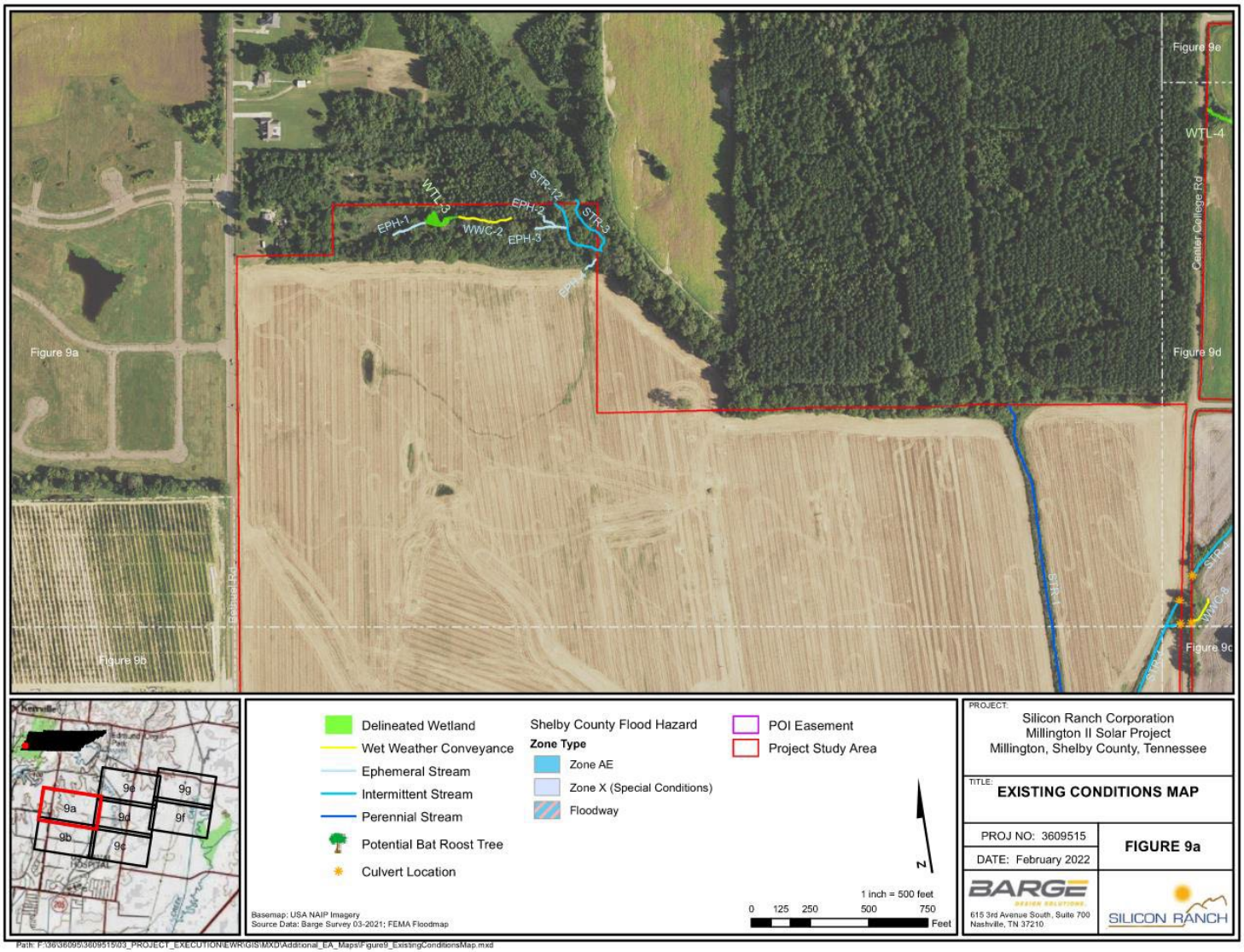

Figure 9a. Environmental Features

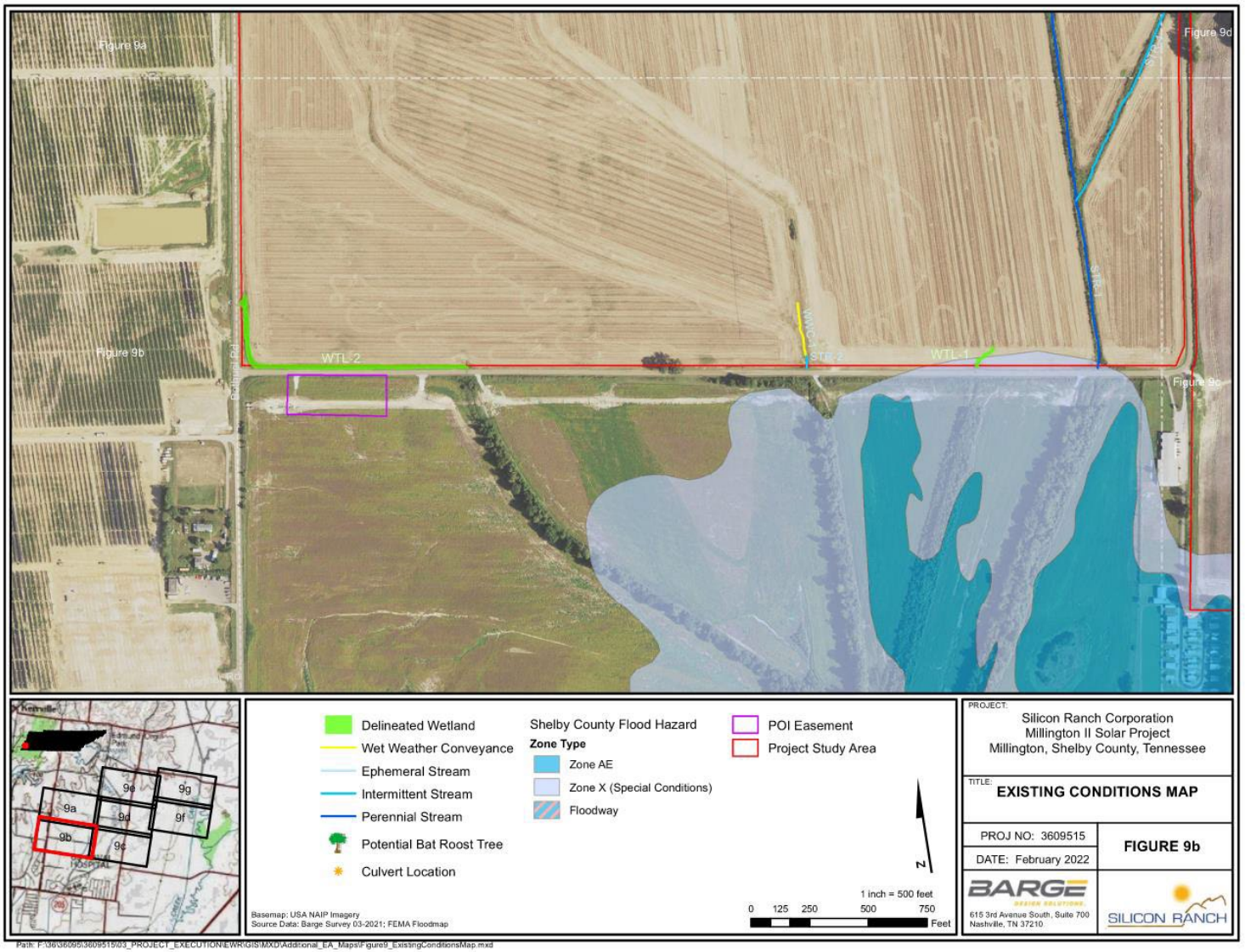

Figure 9b. Environmental Features

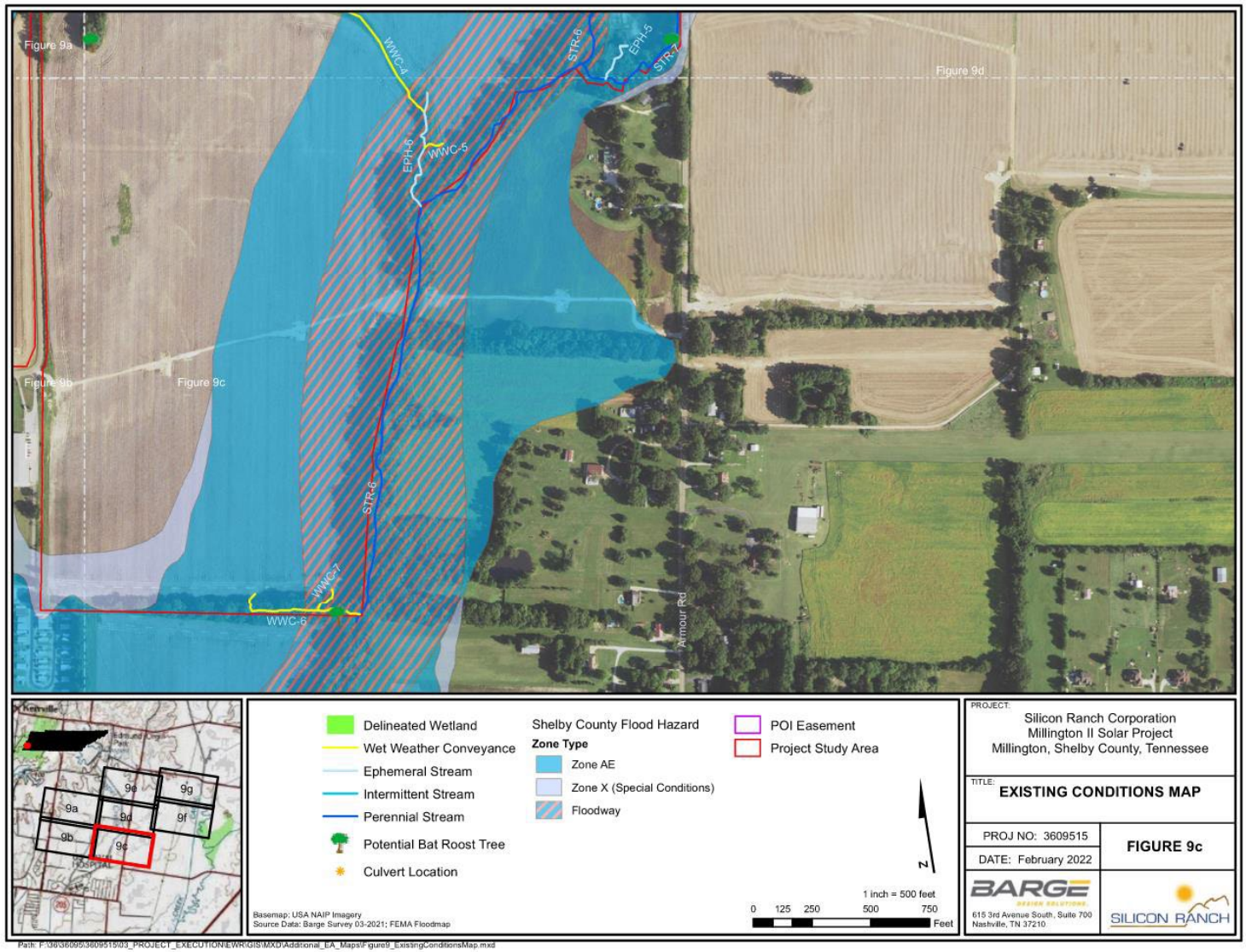

Figure 9c. Environmental Features

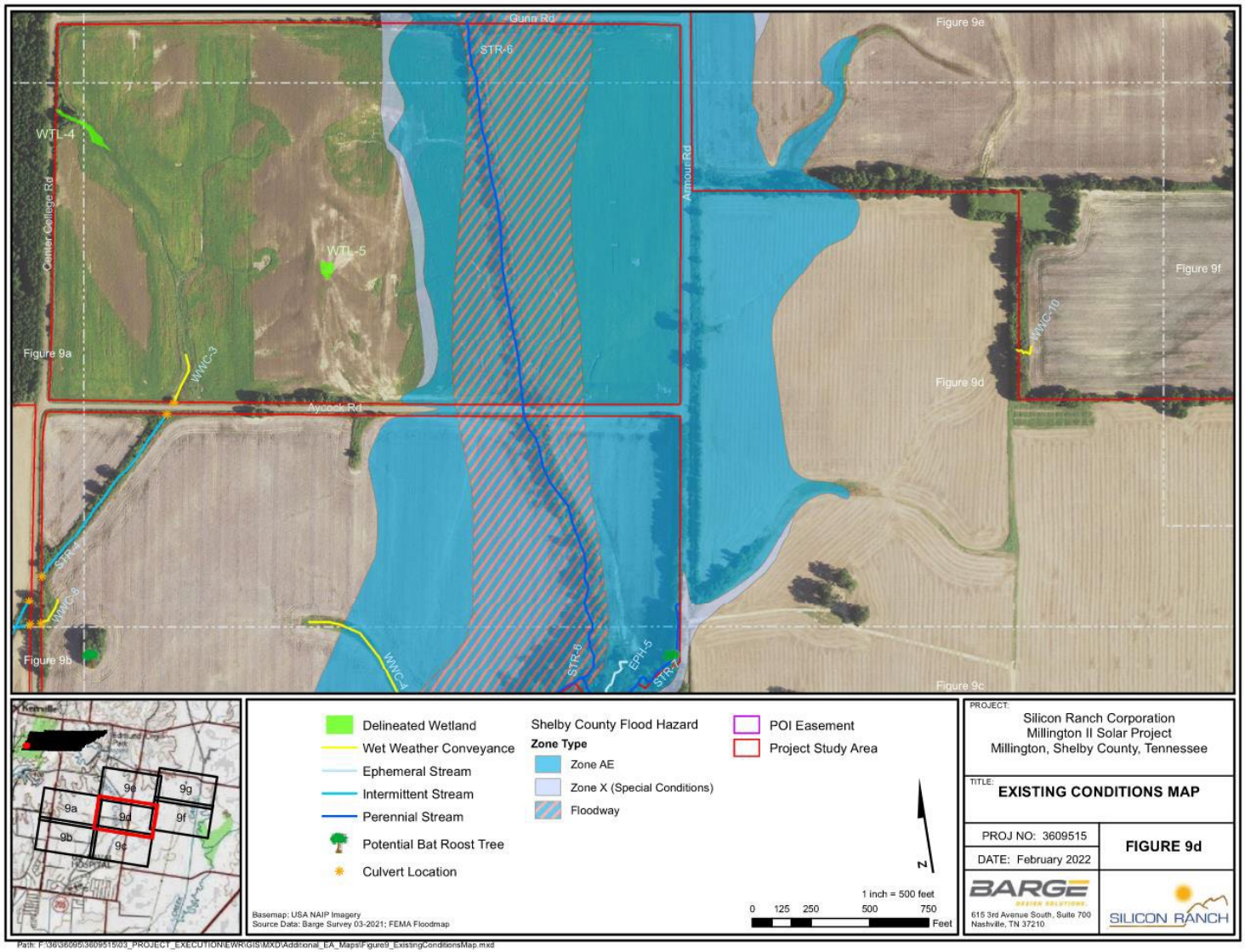

Figure 9d. Environmental Features

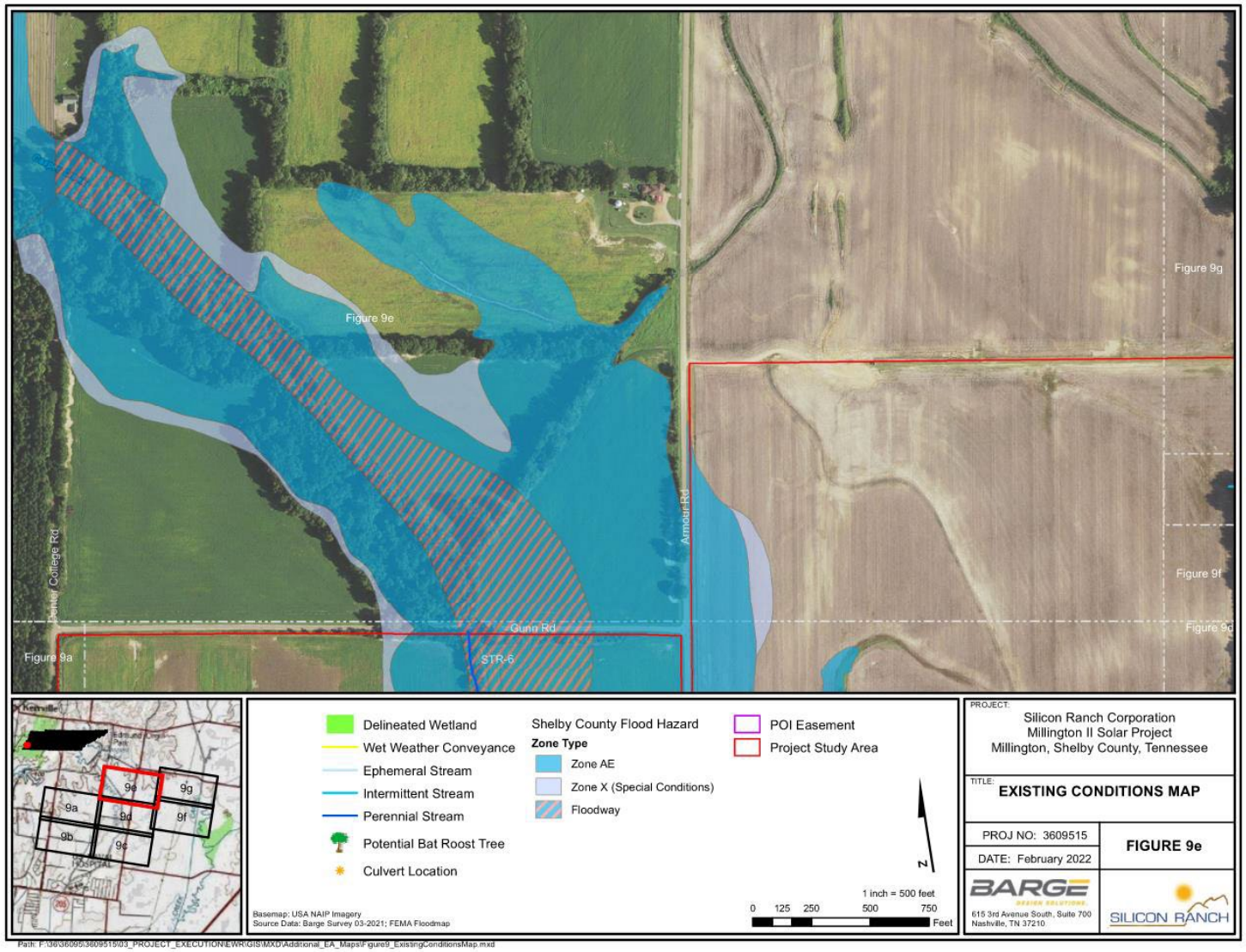

Figure 9e. Environmental Features

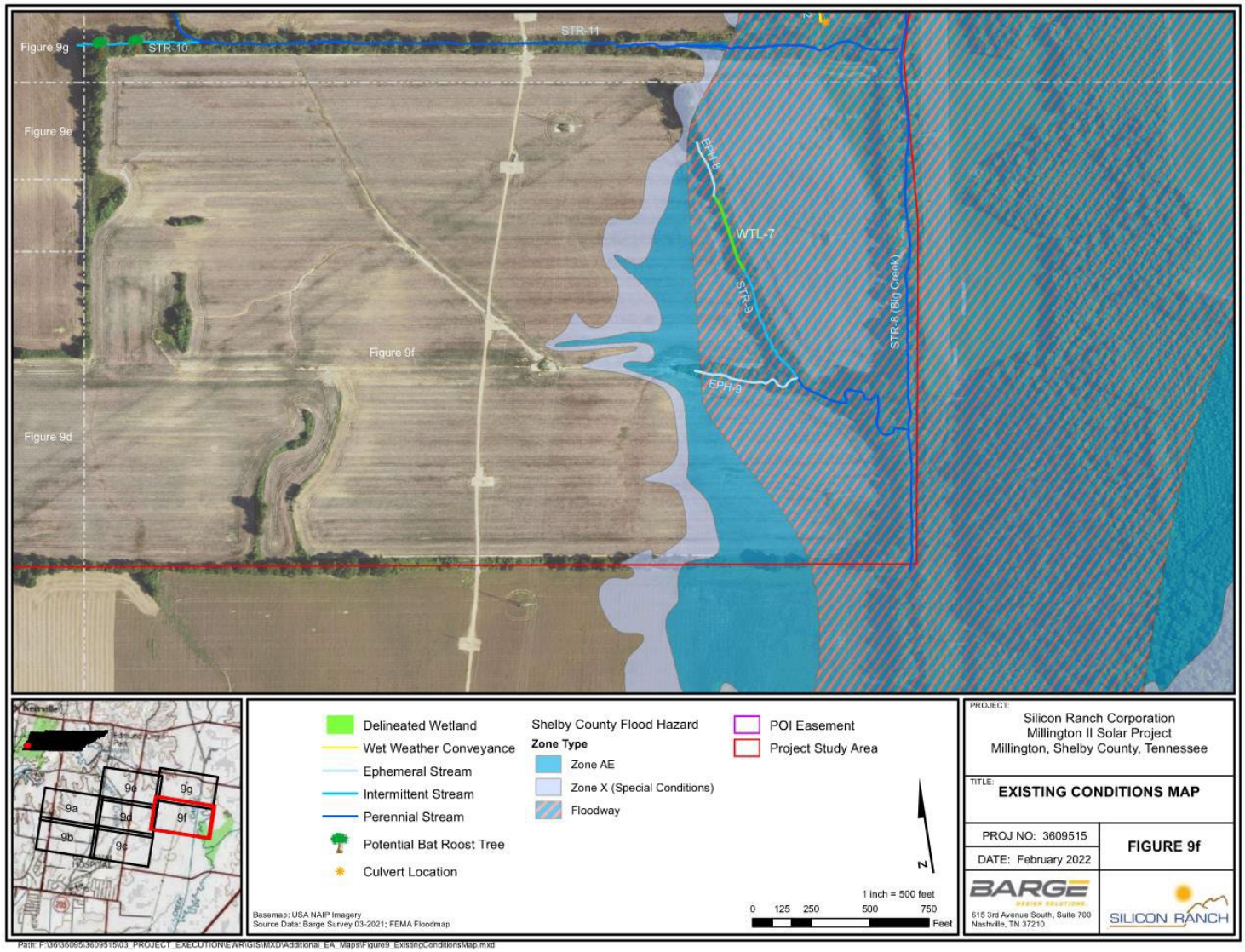

Figure 9f. Environmental Features

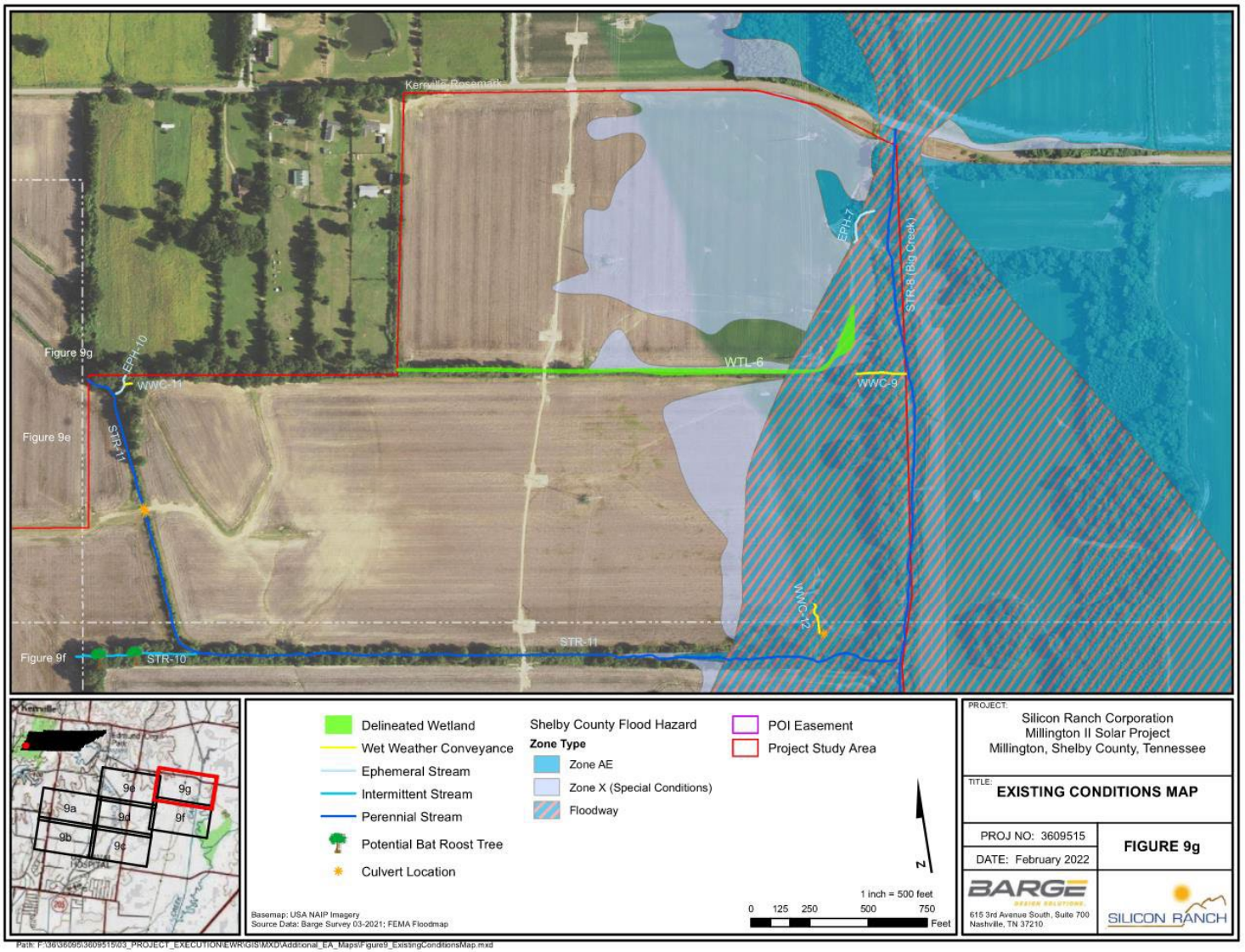

Figure 9g. Environmental Features

The one man-made pond feature within the project study area was WTL-3, which had been breached and allowed for the establishment of a wetland fringe with vegetation along the margins of the open water and down slope PFO wetland. This feature did have a drainage/conveyance feature towards an ephemeral channel which was considered a sign of connection to nearby potentially jurisdictional waters.

The remaining six wetland features were determined as natural, PEM, and PSS ecological communities. WTLs 1, 2, 4, 5, and 6 were PEM, and WTL-7 was considered PSS. Table 4 details the wetland features delineated within the project site.

Table 4: Wetland Features Delineated during Millington II Field Survey

Wetland I.D.	Description	Location Within Project Boundaries	Estimated Amount of Aquatic Resource in Project Area	TDEC TRAM Score	State Jurisdictional Status	Federal Jurisdictional Status
WTL-1	PEM	35.349946, -89.837820	0.03 acres	12	Yes	No
WTL-2	PEM	35.350751, -89.847186	0.41 acres	18	Yes	No
WTL-3	PFO/PUB	35.359421, -89.844365	0.07 acres	32	Yes	No
WTL-4	PEM	35.359309, -89.832742	0.08 acres	15	Yes	No
WTL-5	PEM	35.357451, -89.829670	0.07 acres	11	Yes	No
WTL-6	PEM	35.363081, -89.805513	0.74 acres	18	Yes	Yes
WTL-7	PSS	35.357857, -89.807384	0.06 acres	20	Yes	Yes
Issued letters TDEC HD QHP2105.030 and USACE AJD MVM-2021-294						

In addition to the wetlands identified, 12 WWCs, 10 ephemeral (EPH) streams, 7 intermittent streams, and 5 perennial streams (intermittent and perennial streams are designated as STR) were delineated in the project study area. Most features were determined based on secondary indicators while conducting the Hydrologic Determination, except for STRs 6,7,8, and 11 which were determined by primary indicators. WWCs 1 through 8 and 10, EPHs 1-6, and STRs 1 through 9 and 12 drain within the Big Creek Middle watershed. WWCs 9, 11, and 12, EPHs 7 through 10, and STRs 8 through 11 all drain within the Big Creek Lower watershed.

The WWCs were observed with a lack of an OHWM and a slight presence of a bed and bank. These features also lacked substrate sorting and at times contained a high presence of vegetation in the thalweg with high densities of fibrous roots in the channel. Table 5 describes the WWCs delineated on site.

The ephemeral streams within the project site were observed with a presence of a bed and bank, an OHWM, and some sorting of soil textures. Nearly all the delineated ephemeral channels were observed with small to medium sized headcuts and a bottom of silty-clayey substrate with little to no vegetation in the thalweg. Table 5 describes the EPHs delineated on site.

The seven intermittent streams identified on site were all similar in composition. Most contained a sandy loam substrate, and all with either a strictly clay bottom or clay underlying the sandy loam substrate. These features all had surface water, mostly flowing, throughout, and bed and bank was strong in each. Most of the intermittent streams were observed with a presence of amphibian large and adult frogs. STR-8 (Big Creek) and STRs 1, 6, 7, and 11 were all considered perennial. STRs 6 through 8 and 11 were all considered perennial based on the observed fish species and aquatic macroinvertebrate presence. STR-1 had an obvious connection to groundwater, evident sorting in the sandy substrate, and a well-defined bed and bank. Table 5 describes the streams delineated on site.

Table 5: Stream Features Delineated during Millington II Field Survey

Waterbody I.D.	Description	Location Within Project Boundaries	Linear Feet within Project	Federal Jurisdictional Status	State Jurisdictional Status
STR-1	Perennial	Start 35.356516, -89.836525 End 35.349675, -89.836233	2,507	Yes	Yes
STR-2	Intermittent	Start 35.350216, -89.840338 End 35.350077, -89.84035	51	No*	Yes
STR-3	Intermittent	Start 35.359486, -89.84232 End 35.358861, -89.842041	287	Yes	Yes
STR-4	Intermittent	Start 35.355993, -89.832179 End 35.351663, -89.836252	1,888	Yes	Yes
STR-5	Intermittent	Start 35.353741, -89.834472 End 35.353722, -89.834684	64	Yes	Yes
STR-6	Perennial	Start 35.360135, -89.827279 End 35.346181, -89.830889	5,759	Yes	Yes
STR-7	Perennial	Start 35.353089, -89.825225 End 35.352357, -89.826759	791	Yes	Yes
STR-8	Perennial	Start 35.365756, -89.80377 End 35.353532, -89.805355	4,511	Yes	Yes
STR-9	Intermittent	Start 35.357243, -89.807193 End 35.355171, -89.805165	1,275	Yes	Yes
STR-10	Intermittent	Start 35.360766, -89.816262 End 35.360636, -89.814539	526	Yes	Yes
STR-11	Perennial	Start 35.363965, -89.815636 End 35.359597, -89.804647	4,304	Yes	Yes
STR-12	Intermittent	Start 35.359475, -89.842618 End 35.358876, -89.842046	317	Yes	Yes
EPH-1	Ephemeral	Start 35.359332, -89.844958 End 35.359425, -89.844498	143	No	No
EPH-2	Ephemeral	Start 35.359332, -89.842803 End 35.359169, -89.842501	126	No	No
EPH-3	Ephemeral	Start 35.359199, -89.84265 End 35.359206, -89.842939	88	No	No
EPH-4	Ephemeral	Start 35.358679, -89.842291 End 35.358776, -89.84213	65	No	No

Waterbody I.D.	Description	Location Within Project Boundaries	Linear Feet within Project	Federal Jurisdictional Status	State Jurisdictional Status
EPH-5	Ephemeral	Start 35.352494, -89.826082 End 35.352132, -89.826449	207	No	No
EPH-6	Ephemeral	Start 35.352225, -89.828992 End 35.350931, -89.829267	550	No	No
EPH-7	Ephemeral	Start 35.364491, -89.804541 End 35.364824, -89.804206	186	No	No
EPH-8	Ephemeral	Start 35.358791, -89.807656 End 35.358148, -89.807501	243	No	No
EPH-9	Ephemeral	Start 35.356136, -89.808066 End 35.355915, -89.806625	477	No	No
EPH-10	Ephemeral	Start 35.363952, -89.81509 End 35.363759, -89.815252	97	No	No
WWC-1	Wet Weather Conveyance	Start 35.350849, -89.840372 End 35.350216, -89.840338	233	No	No
WWC-2	Wet Weather Conveyance	Start 35.359446, -89.843995 End 35.359362, -89.843261	228	No	No
WWC-3	Wet Weather Conveyance	Start 35.356648, -89.831817 End 35.356125, -89.83206	213	No	No
WWC-4	Wet Weather Conveyance	Start 35.353383, -89.830522 End 35.352018, -89.82908	711	No	No
WWC-5	Wet Weather Conveyance	Start 35.351611, -89.828857 End 35.35159, -89.829119	85	No	No
WWC-6	Wet Weather Conveyance	Start 35.346658, -89.832267 End 35.346266, -89.830821	561	No	No
WWC-7	Wet Weather Conveyance	Start 35.346605, -89.83117 End 35.346365, -89.831404	130	No	No
WWC-8	Wet Weather Conveyance	Start 35.354004, -89.834033 End 35.353738, -89.834312	135	No	No
WWC-9	Wet Weather Conveyance	Start 35.362963, -89.804738 End 35.362896, -89.804029	213	No	No
WWC-10	Wet Weather Conveyance	Start 35.355578, -89.819839 End 35.355561, -89.820053	97	No	No

Waterbody I.D.	Description	Location Within Project Boundaries	Linear Feet within Project	Federal Jurisdictional Status	State Jurisdictional Status
WWC-11	Wet Weather Conveyance	Start 35.36385, -89.81501 End 35.363853, -89.815112	31	No	No
WWC-12	Wet Weather Conveyance	Start 35.360361, -89.805728 End 35.360008, -89.805695	139	No	No
Issued letters TDEC HD QHP2105.030 and USACE AJD MVM-2021-294					

3.3.1.3 Floodplains

A floodplain is the relatively level land area along a stream or river that is subject to periodic flooding. The area subject to a 1-percent chance of flooding in any given year is normally called the 100-year floodplain. The area subject to a 0.2-percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in the 100-year floodplain to ensure that the project is consistent with the requirements of EO 11988, Floodplain Management. The EO requires that federal projects avoid development in the 100-year floodplain whenever there is a practicable alternative.

The project site spans two Shelby County, Tennessee, FEMA Flood Insurance Rate Maps (FIRMs), Map No. 47157C0185F Panel 185 of 635, effective 09/28/2007 and 47157C0180G Panel 180 of 635, effective 02/06/2013 (Figures 9a and 9b). Map No. 47157C0180G indicates a portion of the project falls within the 1 percent annual chance floodplain of Casper Creek. On the eastern portion of the site, Map No. 47157C0185F indicates a portion of the project site falls within the 1 percent annual chance floodplain of the Big Creek Drainage Canal. A portion of the project site consists of “other flood areas,” including areas of 0.2 percent chance flood and areas determined to be outside of the 0.2 percent annual chance flood. Areas identified as Zone X are determined to be outside of the 0.2 percent annual chance floodplain and are suitable for solar development with no potential risk or severe flooding. Based on the natural resources site investigation, perennial streams were identified within the project site. These perennial streams have a floodplain; however, those floodplains are unmapped.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed and no project-related impacts to water resources would occur.

3.3.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, minor impacts from construction would be expected to groundwater, surface water, wetlands, and floodplains as a result of the Proposed Action Alternative.

Groundwater

Direct adverse impacts to the supply and availability of groundwater are not anticipated with implementation of the Proposed Action Alternative. During construction, hazardous materials would be on site that could potentially contaminate groundwater resources, including petroleum

products for fuel and lubrication of construction equipment, hydraulic fluids, and a variety of other chemicals commonly used for general construction projects. A Spill Prevention, Control, and Countermeasure (SPCC) Plan would minimize the potential for leaks or spills from construction equipment and outline procedures and protocols to quickly address potential spills that may occur. Pollution to groundwater from sedimentation could occur during construction activities resulting from erosion. Appropriate BMPs would be followed, and all proposed project activities would be conducted in a manner to ensure waste materials are contained and the introduction of pollution materials to the receiving waters would be minimized. A general construction stormwater permit would be needed as more than one acre would be disturbed. This permit also requires the development and implementation of a SWPPP.

The proposed TVA substation modifications would be within the existing substation footprint. Therefore, no impacts to groundwater would occur from the modifications.

If the facility were to be decommissioned or closed, a Decommissioning and Closure Plan would be developed. The Decommissioning and Closure Plan would detail procedures to control erosion and sedimentation to comply with NPDES requirements and permits. Water usage for potential decommissioning and closure is not likely to exceed that used for operation and maintenance. Therefore, impacts to groundwater resulting from a decommissioning and closure of the facility are not anticipated.

Overall, impacts on local aquifers and groundwater are not anticipated due to the limited volume of groundwater required for initial construction, operation, maintenance, or decommissioning and closure. Implementation of BMPs and a Decommissioning and Closure Plan would reduce the potential for hazardous materials to reach groundwater resources throughout construction and operations of the facility.

Additionally, minor, indirect beneficial impacts to groundwater could occur from the discontinued use of broad applications of herbicides, pesticides, and fertilizers due to change in land use from agriculture to solar.

Surface Waters and Wetlands

TVA is subject to EO 11990, Protection for Wetlands, which mandates federal agencies avoid new construction in wetlands wherever practicable and otherwise minimize wetland destruction or degradation. Due to the capacity requirements and land constraints, complete avoidance of wetland features was not practicable with the Proposed Action. During all stages of the design process, efforts have been made to avoid and minimize impacts to wetlands and waterbodies to the greatest extent practicable. Approximately 0.08 acres of WTL-2 (WTL-2, table 5, Figure 9b) would be impacted to accommodate the access road to the proposed substation site. One potential permanent impact to perennial Stream 11 (STR-11, Table 5, Figure 9g) may be required to accommodate an interior access road. There is currently a culvert and dirt road crossing that may require modifications to accommodate the access roadway. If modifications to the existing culverted crossing are required, the proposed access road would be 16’ wide to accommodate site access for construction and maintenance.

In addition, four temporary stream impacts (STR-1, STR-4, STR-6 (Casper Creek), and STR-11) would be required to install the proposed feeder lines. The feeder lines would be buried underground, potentially through jack and bore, or open cut trench. If trenching is determined the best method, the disturbed area would be returned to preexisting contours following construction.

Stream crossings, to the extent practicable, would occur perpendicular to the stream. BMPs for stream crossings would be implemented.

The placement of other aboveground facility components, such as PV panels, inverts, generators, and access roads would avoid wetlands on-site. Thirty-foot buffers would be established around avoided wetlands within the Casper Creek watershed and 60-foot buffers would be established around the avoided wetlands in the Big Creek watershed. BMPs such as silt fencing would be installed, inspected, and maintained along the perimeter of the construction area where wetlands are present.

These wetland and stream impacts would be subject to the terms and conditions of a general ARAP from TDEC pursuant to Section 401 of the CWA, and USACE NWP pursuant to Section 404 of the CWA (33 U.S.C. § 1251 et seq.). SR Millington II will comply with compensatory mitigation measures if required by TDEC and USACE. A Hydrologic Determination from TDEC was previously issued and Jurisdictional Determination from the USACE was previously issued. With implementation of appropriate BMPs, impacts to surface waters and aquatic life would be insignificant during construction and no long-term adverse impacts are anticipated.

During the project duration there is a potential for beneficial impacts on streams and wetlands within the project site due to the reduction in annual agriculture activities and applications of pesticides and fertilizer within the project site.

To meet TDEC's buffer requirements for onsite wetlands and streams in the eastern portion of the project site (draining to Big Creek) requires a 60-foot buffer. The wetlands and streams in the western portion of the project site (draining to Casper Creek) require a 30-foot buffer to comply with the TDEC General Construction Stormwater permit (TDEC, n.d. -a). The SWPPP would identify specific BMPs to address construction-related activities that would be adopted to minimize stormwater impacts. Additionally, BMPs, as described in the Tennessee Erosion and Sediment Control Handbook (TDEC, 2012), would be used to avoid contamination of surface water in the project site.

Overall, approximately 14 acres of the existing 52.16 acres would be cleared. Non-mechanical tree clearing would occur on 4.19 acres within stream buffers on-site. In the stream buffer areas where tree clearing is proposed, the stumps would be left in place to minimize ground disturbance. No tree clearing in wetlands or wetland buffers is proposed. One potential permanent stream impact (STR-11) may be warranted to accommodate a proposed access road in the northeast portion of the project site. One permanent wetland impact (WTL-2) of approximately 0.08 acres would occur to accommodate the access road to the proposed substation site. Four temporary stream crossings would occur to accommodate the proposed feeder lines. The SWPPP would identify specific BMPs to address construction-related activities that would be adopted to minimize stormwater and groundwater impacts. Additionally, BMPs, as described in the Tennessee Erosion and Sediment Control Handbook (TDEC, 2012), would be used to avoid contamination of surface water in the project site.

During construction, portable toilets would be provided from the construction workforce as needed. These toilets would be pumped out regularly, and the sewage would be transported by tanker truck to a publicly owned wastewater treatment works that accepts pump out. Equipment washing and dust control discharges would be handled in accordance with BMPs described in

the SWPPP for water-only cleaning. Proper implementation of these and other controls would only result in minor and temporary impacts to surface waters.

Maintenance activities associated with solar panels would possibly include, but would not be limited to, periodic inspections, repairs, herbicide/pesticide use, lawn maintenance, and panel cleanings. Local rainfall is generally consistent enough to avoid the need for dust control on PV arrays. Therefore, regular panel washing is not anticipated. However, if there are water needs during the operation and maintenance phase of the Proposed Action, water would be brought to the site using water supply trucks. Power washing would require approximately 84,000 gallons of water based on the use of approximately 4,500 gallons per 12,000 modules using the wash machine. SR Millington II would source water from nearby water sources such as wells or hydrants. If no local sources are available, SR Millington II would truck water to the site. When washing the panels, water would be absorbed by pervious soils on site. Cleaning operations should utilize pure water, but if an additive is required to help facilitate the cleaning process, the waste product would need to be evaluated to ensure proper disposal of the waste stream according to federal, state, and local regulations. Herbicide/pesticides would not be applied within 50 feet of water bodies and all Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. §136 et seq.) requirements would be followed.

Should the removal of the PV panels be required due to damage or decommissioning activities, most of the decommissioned equipment and materials, including PV panels, racks, and transformers, would be recycled. Materials that cannot be recycled and other waste would be disposed of properly in accordance with applicable local, state, and federal laws and regulations.

Floodplains

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

As shown in Figure 3, the substation and tie line from the TVA TL to the Millington II substation would be located outside 100-year floodplains, which would be consistent with EO 11988. The laydown area, construction trailer, and portable toilets would be outside of the 100-year floodplain. Approximately 27 acres of the 472-acre total developed area would be occupied by solar panels, and would be located within the Casper Creek 100-year floodplain. Some of the access roads would cross the 100-year floodplains of Casper Creek. Portions of the site fencing would be located wihtin the Casper Creek floodplain.

As shown in Figure 3, the proposed project would involve construction of solar arrays, underground wiring for the solar arrays, access roads in 6 areas, the Millington II substation, power inverters and transformers; installation of perimeter fencing, construction laydown areas, temporary construction trailers, portable toilets, and sedimentation basins; light grading, clearing and chipping, and spreading of tree-clearing debris; temporary stockpiling of soil; installation by TVA of equipment inside one or more existing buildings at the existing Shelby TN 500-kV substation; and TVA construction of a short transmission tie line, including fiber, from the existing

Shelby-Drummonds 500-kV transmission line to the Millington II substation. At the end of its useful life, the solar facility would be decommissioned and dismantled.

Area 1 would be located outside the 100- and 500-year floodplains of Casper Creek. Portions of Areas 2, 3, 4, and 5 would be located within the mapped 100-year floodplain of Casper Creek. Area 6 would be located outside the 100- and 500-year floodplains of Big Creek Drainage Canal.

Based on the Shelby County, Tennessee, FIRMs and topographic maps, some of the proposed solar panels and one inverter would be located within the 100-year Casper Creek floodplain. The project layout in Figure 3 shows the locations of solar panels within the floodplain in Areas 2-5. Due to existing site constraints, including cultural resources, surface waters, and property for potential future development, approximately 27 acres of solar panels cannot be located outside of the 100-year floodplain. Further, the number of proposed panels are required to meet the PPA between SR Millington II and TVA. Therefore, TVA has determined that there is no practicable alternative to locating approximately 27 acres of the 472 acres of solar panels in the 100-year floodplain. To minimize adverse impacts, the panels would be mounted on steel pilings and, at their lowest point, would be a minimum of one foot above the 100-year flood elevation and comply with the floodplain development standards for Shelby County. Additional details regarding the No Practical Alternatives Analysis are provided in Appendix B.

However, no adverse impacts are anticipated from locating these panels and the one inverter in the floodplain. The panels would be mounted on steel pilings and, at their lowest point, would be a minimum of 1-foot above the 100-year flood elevation and comply with the floodplain development standards for Shelby County. Should there be a flooding event, flood waters covering the ground would not be impeded by the panels and the elevation of the panels and the inverter should be sufficiently high enough for the panels to avoid being impacted by floodwater.

The underground feeder line would cross the 100-year floodplain of Casper Creek. Consistent with EO 11988, underground electric lines are considered to be repetitive actions in the 100-year floodplain, which would result in minor impacts (TVA 1981). Portions of the fences would be located in the Casper Creek floodplain. Consistent with EO 11988, fences are considered repetitive actions in the 100-year floodplain that should result in minor impacts. To minimize adverse impacts, the fences would be designed and constructed to withstand flooding with minimal damage.

Some tree clearing would occur in the floodplains; however, tree clearing would have a slight beneficial impact on the floodplains because more space would be available to store floodwater. The cleared trees would be chipped and spread on site, which would have a negligible effect on flood elevations, and therefore be consistent with EO 11988.

When the solar facility is decommissioned and dismantled, any debris would be disposed of in an area outside 100-year floodways.

By adhering to the following mitigation measures, the proposed Millington II solar facility and appurtenant structures, access roads, Millington II substation, generation tie line from the Millington II substation and the Shelby-Drummonds 500-kV TL, and telecommunications equipment installed at the Shelby, TN, 500-kV substation would have no significant impact on floodplains and their natural and beneficial values:

- Standard BMPs would be used

- Any road crossings within the 100-year floodplain would be done in such a manner that upstream flood elevations would not be increased by more than 1 foot
- If hauled offsite for disposal, excavated material and debris whenthe facility is decomissioned and dismantled would be spoiled outside the 100-year floodway
- Every effort would be made to keep stockpiled soil from eroding into streams
- The solar panels would be elevated at least one foot above the 100-year flood elevation

3.4 BIOLOGICAL RESOURCES

This section provides an overview of existing biological resources within the Millington II site and potential impacts to biological resources associated with the Proposed Action Alternative and No Action Alternative.

3.4.1 Affected Environment

The existing biological resources reviewed include vegetation, wildlife, and rare, threatened, or endangered (T&E) species.

A desktop survey was performed prior to field investigations of the proposed project site. Wildlife, vegetation, and T&E species were researched during the desktop survey and verified through field investigations in April 2021. Results of the desktop survey, field investigations, and list updates are described in this section.

Biological resources are regulated by several federal and state laws. The laws and rules relevant to the Proposed Action undertaken by SR Millington II include:

- The Endangered Species Act (16 U.S.C. §§ 1531-1544)
- The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712) (for actions of nonfederal entities)
- The Executive Order 13186 (January 10, 2001) Responsibilities of Federal Agencies to Protect Migratory Birds
- Rules of the Tennessee Wildlife Resources Agency, Chapter 1660-01-32 (based on the authority provided in Tennessee Code Annotated §§ 70-1-206, 70-8-104, 70-8-106 and 70- 8-107)

3.*4.1.1 Vegetation*

The project area is mainly utilized for agricultural fields with multiple seasonally planted crops. The planted fields were observed with last year's corn or soy production and this year's winter wheat harvest. In between the agricultural fields and the natural wooded portions of the project study area, low herbaceous growth areas were observed. Species present include foxtail grass (*Setaria pumila*), orchard grass (*Dactylus glomerata*), perennial ryegrass (*Lolium perenne*), common vetch (*Vicia sativa*), and Johnson grass (*Sorghum halepense*). In some of the wetter portions of the pastureland within the project study area, fox sedge (*Carex vulpinoidea*), spikerush (*Eleocharis palustris*), and poison ivy thickets (*Toxicodendron radicans*) were observed.

Native fragmented woodland was also observed along much of the riparian margin areas, especially along Big Creek and Casper Creek. This forest community ranges between early successional forest to secondary growth mixed hardwood forest. Dominant vegetation in the woodland portion of the project area includes white oak (*Quercus alba*), northern red oak (*Q. rubra*), southern red oak (*Q. falcata*), post oak (*Q. stellata*), water oak (*Q. nigra*), red cedar (*Juniperus virginiana*), green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*),

sugarberry (*Celtis laevigata*), American elm (*Ulmus americana*), black willow (*Salix nigra*), black walnut (*Juglans nigra*), and black cherry (*Prunus serotina*) in the tree stratum; honeysuckle (*Lonicera maackii*), privet (*Ligustrum sinense*), and blackberry (*Rubus argutus*) in the shrub stratum; and Virginia creeper (*Parthenocissus quinquefolia*), woodoats (*Chasmanthium latifolium*), Japanese silt grass (*Microstegium vimineum*), and wingstem (*Verbesina alternifolia*) in the herbaceous stratum.

3.4.1.2 Wildlife

Native wildlife was observed throughout the project study area. Identified wildlife was observed utilizing the fragmented forested portions of the site, the open agricultural land, and the surrounding residential and industrial environments. Table 6 below details some of the observed wildlife during the field investigations. This list is a preliminary species presence list for the project study area.

Table 6. Observed Wildlife within Project Site

Common Name	Scientific Name
Birds	
American robin	*Turdus migratorius*
Barn Swallow	*Hirundo rustica*
Blue jay	*Cyanocitta cristata*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Brown Thrasher	*Toxostoma rufum*
Carolina wren	*Thryothorus ludovicianus*
Cooper's hawk	*Accipiter cooperii*
Eastern Bluebird	*Sialia sialis*
Eastern Kingbird	*Tyrannus tyrannus*
Eastern Towhee	*Pipilo erythrophthalmus*
European starling	*Sturnus vulgaris*
Field sparrow	*Spizella pusilla*
Great blue heron	*Ardea herodias*
House finch	*Haemorhous mexicanus*
Indigo bunting	*Passerina cyanea*
Killdeer	*Charadrius vociferus*
Northern cardinal	*Cardinalis*
Northern mockingbird	*Mimus polyglottos*
Mourning Dove	*Zenaida macroura*
Red-eyed Vireo	*Vireo olivaceus*
Red tailed hawk	*Buteo jamaicensis*
Red-winged black-bird	*Agelaius phoeniceus*
Tufted titmouse	*Baeolophus bicolor*
Yellow warbler	*Setophaga petechia*

Common Name	Scientific Name
Mammals	
Eastern chipmunk	*Tamias striatus*
Eastern gray squirrel	*Sciurus carolinensis*
White-tailed deer	*Odocoileus virginianus*
Racoon	*Procyonidae lotor*
Nine Banded Armadillo	*Dasypus novemcinctus*
Coyote	*Canis latrans*
Reptiles	
Common Garter snake	*Thamnophis sirtalis*
Cottonmouth	*Agkistrodon piscivorus*
Eastern Box Turtle	*Terrapene carolina*
Ground skink	*Scincella lateralis*
Northern Water Snake	*Nerodia sipedon*
River Cooter	*Pseudemys concinna*
Amphibians	
American toad	*Anaxyrus americanus*
Gray treefrog	*Hyla versicolor*
Green frog	*Lithobates clamitans*
Southern Leopard Frog	*Lithobates sphenocephalus*
Upland Chorus Frog	*Pseudacris feriarum*
Fish	
Creek Chub	*Semotilus atromaculatus*
Minnow spp.	*Pimephales sp.*
Mosquito fish	*Gambusia affinis*
Green sunfish	*Lepomis cyanellus*
Invertebrates	
Eastern tiger swallowtail	*Papilio glaucus*

Migratory Birds

The USFWS Information for Planning and Conservation (IPaC) Trust Resource website was evaluated for migratory bird species that may be present within the project site and is included in Appendix C.

The USFWS IPaC report identified five species of migratory Bird of Conservation Concern (BCC) that have the potential to occur in the vicinity of the project site: the American kestrel (*Falco sparverius paulus*), prothonotary warbler (*Protonotaria citrea*), red-headed woodpecker (*Melanerpes erythrocephalus*), rusty blackbird (*Euphagus carolinus*), and wood thrush (*Hylocichla mustelina*). A BCC is a species that is not already federally listed and represents USFWS's highest conservation priorities. The IPaC report indicates the following: the American kestrel breeds April 1 – August 31 with the highest probability of occurrence in the project site November through March; the prothonotary warbler breeds April 1 – August 31 with the highest probability of occurrence in the project site in late June; the red-headed woodpecker breeds May 10 – September 10 with highest probability of occurrence in the project site from early May through late June and late October; the rusty blackbird breeds elsewhere with the highest probability of occurrence in the project site December through early March; and the wood thrush (*Hylocichla mustelina*) breeds May 10 – August 31 with the highest probability of occurrence in the project site in late June (USFWS, n.d. -a). Though none of these species were identified on site, the mixed habitat present throughout the site may provide resources for these birds (Cornell University, 2020). Heronries/colonies were not identified within the site or within three miles of the site. Further, heronries/colonies were not observed on site during the field investigation.

3.4.1.3 Threatened and Endangered (T&E) and Other Rare Species

TVA provided a Heritage Database query for the project site. The search criteria included aquatics (within a 10-mile radius of the project site, county, and HUC), botany (within a 5-mile radius of the project site and the county), natural areas (within a 5-mile radius of the project site), and terrestrial zoology (within a 3-mile radius project site and county). No state or federally listed species were observed during the April 2021 site inspection. Table 7 details the potential presence of threatened and endangered federal and state-protected species for the area from the TVA Heritage Database query, USFWS IPaC database (USFWS, n.d. -a) and TDEC Rare Species Data Viewer (TDEC, n.d. -b). No threatened or endangered protected rare plants, aquatic species, and natural areas are present on the project site.

Table 7. Protected Species Potentially within the Project Site

Common Name	Species	State Status	Federal Status	Habitat Type	Habitat Present	TN State Rank
Mammal						
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Threatened	Hibernates during winter in caves or occasionally in abandoned mines. Summer roosting season in late spring and summer months. Females will roost on trees with exfoliating bark and/or trees with cracks, crevices, and hollows. Will rarely roost in barns or other similar shed-like structures.	Yes (Roosting)	S1S2
Indiana Bat	*Myotis sodalis*	Endangered	Endangered	Hibernates during winter in caves or occasionally in abandoned mines. Summer roosting season in late spring and summer months. Females will roost on trees with exfoliating bark and/or trees with cracks, crevices, and hollows.	Yes (Roosting)	S1
Birds						
Interior Least Tern	*Sterna antillarum athalassos*	Endangered	Delisted	Coastal habitats along large rivers, harbors, bays, and inlets with open flats for nesting. Has been documented along the Mississippi River shoreline in TN.	No	S2S3B
Piping Plover	*Charadrius melodus*		Endangered	Is known to migrate along the Mississippi River, but no known nesting spots are documented within TN.	No	
Reptiles						
Northern Pinesnake	*Pituophis melanoleucus*	Threatened	N/A	Well-drained sandy soils in pine/oak woods; dry mountain ridges; East portions of west TN, East to lower elevations of the Appalachians	No	S3

State Rank Abbreviations:
S1: Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few remaining individuals, or because of some special condition where the species is particularly vulnerable to extinction
S2: Very rare and imperiled within the state, six to twenty occurrences, or few remaining individuals, or because of some factor(s) making it vulnerable to extinction
S3: Rare and uncommon in the state, from 21-100 occurrences
_B: Rank of Breeding Population
Data Sources:
* TVA Heritage Database Query
*TDEC Rare Species Data Viewer
* USFWS IPaC

The USFWS IPaC Trust Resource website was evaluated for potential species that may be present within the project site. An official list of T&E species that may be affected by activities performed at this location can be found in Appendix C.

Two species of federally listed mammals potentially occur on the project site: the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*). No record of the Indiana bat is known from Shelby County. One record of the northern long-eared bat is known for Shelby

County. The closest known northern long-eared bat records are from a summer roost approximately seven miles away (ArcGIS, n.d.). The closest known Indiana bat record is a maternity roost approximately 85 miles away (USFWS, n.d. -b).

Winter habitats (hibernacula) used by these species include caves, mines, and cave-like structures (Endangered and Threatened Wildlife and Plants, n.d., NatureServe, n.d., USFWS, n.d. -b, n.d. -c). Indiana bats and northern long-eared bats also utilize areas near caves in the fall and spring (for swarming and staging) prior to migration back to their summer habitat (roosting habitat) (NatureServe, n.d.). Per the Tennessee Cave Survey (subworks.com), there are no caves in Shelby County.

During the summer, Indiana bats roost under the exfoliating bark of dead and living trees in mature forests with an open understory, often near water sources. Indiana bats are known to change roost trees frequently throughout the season yet still maintain site fidelity, returning to the same summer roosting areas in subsequent years. This species forages over forest canopies, along forest perimeters, tree lines, and occasionally over bodies of water (Kurta et al., 2002, USFWS, n.d. -d).

In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees. While roost selection is similar to Indiana bats, northern long-eared bats are more opportunistic in roost site selection. This species has also been documented roosting in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads and occasionally over forest clearings and along riparian areas (USFWS, n.d. -c).

The survey for potential suitable roosting habitat was performed concurrently with the surface water delineation in April 2021. The Range-wide Indiana Bat Survey Guideline Phase I protocol was implemented to conduct the potential habitat survey (USFWS 2020). No suitable caves or potential hibernacula sites for all federally listed bat species were observed in the project area. Potential roosting habitat was identified as trees larger than 3 inches in diameter at breast height, containing loose or shaggy bark or crevices suitable for use. There is potential suitable bat roosting habitat for the Indiana bat and the northern long-eared bat located within the project site, which can be found in Figures 7a-7g. A total of five potential bat roost trees were observed and documented within the wooded portions of the project site. A bat habitat map is provided in Appendix D. There are approximately 51 acres of woodland on site. Of this, approximately 29.85 acres were qualified as “marginal” quality habitat, and 21.33 acres were identified as “poor” quality habitat. No “good” quality habitat was identified on site. Habitat quality was based on roosting suitability of trees, density of forest midstory, and proximity to water sources.

The interior least tern and piping plover were listed as potentially occurring the project area. Both species are typically located along the coastal areas of the Mississippi River. The Mississippi River is located well beyond the project area, and the potential installation of solar arrays would not adversely impact the two coastal bird species.

In addition to the state and federally listed species listed in the TVA preliminary Heritage Database query, the bald eagle (*Haliaeetus leucocephalus*) has been documented in the region of the project study area. The bald eagle is federally protected by the Bald and Golden Eagle Protection Act (BGEPA). The act prohibits the take of bald and golden eagles, as well as harassing, disturbing, or possessing remains of the two eagle species. Bald eagles are typically observed

near large bodies of water where they forage and breed. Big Creek could potentially provide suitable foraging habitat for the bald eagle. During the site investigation in April 2021, no bald eagles were observed foraging or nesting within the project study area or observed flying over the area.

Northern pinesnakes are typically found across the Southeast, throughout the Coastal Plain of North Carolina, South Carolina, Georgia, and throughout Florida, and in populations of the dry mountains of Virginia, Tennessee, and Northern Georgia. This species is often found in longleaf pine or turkey oak forests. Occasionally, they are seen in abandoned fields and dry mountain ridges. Infertile, sandy soils are suitable habitat for pinesnakes to accommodate digging hibernacula and summer dens. The project study area consists of mainly silt loam soils and likely does not provide suitable habitat for the northern pinesnake.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed and no project-related impacts to wildlife or the roosting sites of the northern long-eared bat or the Indiana bat would occur. Additionally, no vegetation would be disturbed or removed under the No Action Alternative.

3.4.2.2 Proposed Action Alternative

Vegetation

Under the proposed action, approximately 14 acres of the wooded area would potentially require tree removal for the development of the site. A map depicting the proposed tree clearing is provided in Appendix D. Following construction of the solar facility, the remaining project area would be maintained to prevent vegetation from growing above panel height.

Taking into consideration the large amount of similar vegetation types in the area both regionally and locally, clearing the existing vegetation, removing cropland, and grading would be considered minimal and insignificant impacts. The surrounding area consists of similar vegetation communities, and the effects of the conversion of agricultural and open land would be relatively small. Direct impacts to forested land would be minimal as most of the tree species on the project site are located adjacent to the site locally and regionally. Following construction, the solar facility would be maintained to prevent vegetation from growing above the panel height, converting the vegetation from maintained agricultural practices.

The effects of the conversion of agricultural and open land would be further reduced as revegetation of the site would be accomplished using native and/or noninvasive species. Disturbed areas would be seeded post-construction using a mixture of certified weed-free, low-growing native grass seed obtained from a reputable seed dealer and in compliance with the requirements established by the local office of the NRCS. Pollinator-friendly seed mix would be placed in designated disturbed areas, which may provide more flowering plants than previously occurred on site. The Proposed Action Alternative would not significantly contribute to the introduction of exotic or invasive species.

BMPs and appropriate erosion controls would be used to minimize soil exposure and soil erosion from the project site. Silt fences, sedimentation basins, and other appropriate controls would be used as needed to minimize exposure of soil and to prevent eroded soil from leaving the work

area. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has become well-established and stabilized.

The area proposed for interconnection is maintained and mowed. No impact to vegetation is anticipated. As the TVA substation upgrades would occur within the footprint of the existing substation, no impact to vegetation is anticipated.

Wildlife

Wildlife present at the time of construction would be impacted, particularly during the use of heavy machinery for vegetation clearing and driving piles. This would result in the displacement of any wildlife (primarily common, habituated species) currently using the area. Direct effects to some individuals may occur if those individuals are immobile during the time of habitat removal. This would be more likely to occur if activities took place during breeding/nesting seasons or winter hibernation periods when animals are immobile in shallow borrows. Habitat removal likely would disperse mobile wildlife into surrounding areas to find new food sources, shelter sources, and reestablish territories. Those animals able to use early successional habitats could return to the site upon completion of the project. Approximately 485 acres of habitat is not proposed for development and would be available for wildlife use. Due to the amount of similarly suitable habitat in areas immediately adjacent to the project site, populations of common wildlife species likely would not be significantly impacted by the proposed actions. Any impacts would also be temporary until wildlife moved out of the construction area.

Migratory BCC identified by the USFWS may be impacted by the proposed action including the American kestrel, prothonotary warbler, red-headed woodpecker, rusty blackbird, and the wood thrush. While these species were not observed on site during field reviews, suitable habitat for the species was observed. Vegetation removal is proposed when these species could be on site at the end of their breeding seasons when second broods may be reared. Direct effects could occur to these nestlings in proposed areas of tree removal. Mobile individuals are expected to flush if disturbed. Additionally, because no lights would be needed at the project site once construction is completed, there should not be any adverse impacts due to lights on migratory birds. Due to the timing of the proposed vegetation removal (Oct 15-March 31), the relative abundance of similarly suitable habitat nearby, and not using lights at the project site, it is expected that populations of these migratory bird species would not be significantly impacted.

Overall, direct impacts to wildlife would be minor and insignificant during construction, and wildlife populations may be able to disperse to undeveloped habitat within the project site. Upon completion of the project, the site would be revegetated using a mixture of certified weed-free, low-growing native grass seed obtained from a reputable seed dealer and in compliance with the requirements established by the local office of the NRCS. Pollinator friendly seed mix would also be placed in designated disturbed areas, which would provide more flowering plants than previously occurred on site. Wildlife able to use this type of habitat are expected to return to the site upon completion of proposed actions.

The area proposed for interconnection is currently maintained for overhead TLs. No impact to wildlife is anticipated. As the TVA substation upgrades would occur within the footprint of the existing substation, no impact to wildlife is anticipated.

Threatened and Endangered (T&E) and Other Rare Species

Under the Proposed Action Alternative, two mammals, the northern long-eared bat and the Indiana bat have the potential to occur on the project site. No suitable habitat for piping plover, interior least tern, or northern pinesnake occurs on the project site. These species would not be impacted by the proposed actions. The project site was observed with multiple forested vegetative communities that were categorized on quality to provide suitable bat habitat. These forested vegetative communities include mature riparian forest, mixed growth forest, early successional forest, and fence row frequently disturbed young forest. The mature riparian forest was observed along both Casper Creek, in the center of the project study area, and Big Creek, along the eastern limit. The mature riparian forest accounts for approximately 21.35 acres and was rated as "marginal" bat habitat, due to the historic agricultural disturbance and channelization of the perennial streams.

The mixed growth forest was observed in disturbed portions of woodland where natural growth stages of forested vegetation varied between early successional and semi-mature. This portion of woodland was rated as "marginal," due to the varied growth stages of forested habitat and a slight presence of shrub and sapling undergrowth vegetation. The mixed growth forest accounted for approximately 6.44 acres of the project site.

The early successional forest was observed throughout the project study area and was determined on the young growth stage of the forested community, a high presence of shrub, sapling and vine vegetation, and ongoing disturbance from the agricultural land use. The early successional forest accounts for approximately 9.87 acres and was rated as "poor" bat habitat. The fence row/agricultural field hedge row young forest community was observed in strips throughout the project study area, which accounts for approximately 10.76 acres of woodland, and was rated as "poor" bat habitat.

Additionally, isolated pockets of mature and young trees were observed sporadically throughout the project study area. This vegetative community was selectively maintained at varying growth stages and was rated between "poor" and "marginal." Both the roadway trees to an adjacent cemetery and individual large growth trees were rated as "marginal" and account for approximately 2.06 acres of mature trees, whereas pockets of younger growth trees in spoil piles of the agricultural fields were rated as "poor" and account for approximately 0.70 acres of young trees.

Of the approximate 14 acres of forest proposed for clearing, approximately 6 acres identified as marginal quality habitat and 8 acres of poor-quality habitat would be cleared. Four of the five observed potential bat roost trees would require removal. Since no known hibernacula for these federally listed bat species were within five miles of the project study area and the quantity of forested woodland removal is relatively small, removal of these potential roost trees can be performed during the non-roost season (October 15 to March 31) with little to no impact to the species. Also, no suitable winter roosting habitat exists for the two bat species.

Wetlands, streams, and forested areas offer suitable foraging habitat for bat species. Two permanent minor surface water impacts are proposed. One potential permanent impact to a perennial stream may be required for a proposed interior access road. The wetland impact is in the southwest corner of the project site. Approximately 0.08 acres of a roadside wetland ditch would be impacted by constructing an access road to where the substation would be constructed. Neither site provides quality habitat to either bat species. The four temporary stream impacts

associated with placement of the feeder lines would only have minor, temporary impacts. BMPs would be used around avoided streams and wetlands to minimize potential impacts to bat foraging habitat. Tree removal is proposed between October 15 and March 31 of any given year. Tree removal at this time of year would avoid direct impacts to non-volant pups roosting in trees. With the commitment to clear trees in winter and use of BMPs around bodies of water where foraging may occur, proposed actions would not significantly impact Indiana bat or northern long-eared bat. Section 7 consultation determined that proposed actions may affect but are not likely to adversely affect (NLAA) Indiana bat and northern long-eared bat (Appendix E).

The area proposed for interconnection would be within an existing overhead TL owned and maintained by TVA. The TVA substation upgrades would occur within the footprint of the existing substation. Therefore, impacts to T&E species with the potential interconnect to existing overhead TLs and substation are not anticipated. No bald or golden eagle nests were identified on site. Only two bald eagle nests approximately 13 miles west of the project site have been recorded from Shelby County (Bald Eagle Nest Map, n.d.). Golden eagles are rare in Tennessee and are not known to nest in the state. Therefore, the BGEPA is not included in the relevant laws and rules to the Proposed Action Alternative. Impacts to the federally protected bald eagle within the project area are not anticipated during the installation of the solar arrays and associated facilities.

3.5 VISUAL RESOURCES

This section provides an overview of existing visual resources within and surrounding the Millington II project site and potential impacts to visual resources associated with the Proposed Action Alternative and No Action Alternative.

3.5.1 Affected Environment

Visual resources are the characteristics of a place, both natural and manmade, that give a particular landscape its character and aesthetic quality. An observer's experience within or near a specific location can be determined by the visual resources surrounding that location. A viewshed is defined as the environment that is visible from a certain vantage point.

The project site, located east of the City of Millington in Shelby County, is primarily farmland with relatively flat terrain. The regional character is mostly rural, with agricultural and pasture fields and some forested areas. The site is surrounded by agricultural fields and residential development comprised of single-family homes. While some wooded areas are within and around the project site, the land has been actively farmed and is mostly cleared. A mature forest buffer along the Casper Creek visually blocks a portion of the project from vehicles traveling along and the single-family homes along Amour Road, south of the project site. A mostly forested parcel located north of the project site and southwest of the intersection of Center College Road and Kerrville-Rosemark Road blocks the project site from vehicles traveling along Kerrville-Rosemark Road. There is also a forested buffer along the northern property boundary between the project site and single-family residences along Bethuel Road.

Big Creek drainage canal borders the eastern boundary of the project site. The feature includes a forested buffer shielding some of the project site from Kerrville-Rosemark Road located north and east of the project site. The land east of the project site is primarily farmed and undeveloped property.

The Millington-Memphis Airport is approximately 0.9 miles west of the site, west of Millington I solar facility. The Millington I TL travels from the Millington I project site, west of Bethuel Road,

along Center College Road, and north to the existing substation about 0.5 miles north of Mudville Road. The TL corridor has been cleared and is periodically mowed. The proposed TL interconnection is located south of the site, south of Center College Road and east of Bethuel Road within the existing TVA TL corridor.

Due to its proximity to the Millington-Memphis Airport, Capital Airspace Group (2021) prepared a glint and glare analysis according to FAA standards and the FAA's interim policy for Solar Energy System Projects on Federal Obligated Airports. The glint and glare analysis is enclosed within Appendix F.

The Proposed Action Alternative would result in the installation of approximately 227,682 individual solar panels arranged over roughly 472 acres of the 957-acre site. At full extension, these panels are roughly 6 to 8 feet in height, depending on grade, and would have minimum setback of 30 feet from the property boundary. The glint and glare analysis considered specifics to the PV panels, including single-axis tracking, surface material, and maximum tracking angle. The panels would face 60 degrees east and track the sun throughout the day until they face 60 degrees west at sunset. At sunset the modules would track to a flat stow position. The PV panel surface material would be a smooth glass with an AR coating.

The analysis considered the potential for glare impacts on Millington-Memphis Airport approach paths, the personnel at the airport's air traffic control tower (ATCT), and persons living in nearby residences and traveling along roads in the area of the project. The analysis was done using the Sandia National Laboratories (Solar Glare Hazard Analysis Tool) SGHAT technique. The SGHAT analyzes the potential for glare over the entire calendar year in one-minute intervals from when the sun rises above the horizon until the sun sets below the horizon.

The SGHAT results do not predict glare occurrences along the Runway 07 or Runway 25 approach path or for personnel in the ATCT. For nearby residences, the SGHAT assessed the potential for glare occurrences at 111 discrete observation points. Each observation point was assessed at an 8-foot first story viewing height and a 16-foot second story viewing height. The SGHAT results do not predict glare occurrences for any of the 111 observation points at either viewing height. For roads, the SGHAT assessed the potential for glare occurrences along eight routes. Each roadway was assessed at a 4-foot car viewing height and an 8-foot truck viewing height. The SGHAT results do not predict glare occurrences for any of the eight roadways at either viewing height.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be built and there would be no project-related changes to the area's visual character. Existing views would be expected to remain unchanged.

3.5.2.2 Proposed Action Alternative

Construction of the solar facility would temporarily alter the visual character of the project site. Heavy machinery would be present during construction, changing the visual characteristics from vantage points surrounding the project site. In areas where grading would be necessary, minor changes to the ground surface's contour, color, and texture would be visible. ECDs such as silt fences would likely be visible from the properties adjacent to the project site. Visual impacts from construction would be minimal at night since most construction is anticipated to occur during the

day. Erosion control silt fences and sediment traps would be removed once construction is complete.

During the project's operational phase, some of the project would be visible from nearby roads and highways. The solar facility site would be revegetated with both planting and natural regrowth and the site would be surrounded by a chain-link fence. Generally, nearby residences are surrounded by mature trees that obstruct some of the views towards the project site. There are three residential developments near the project site. The first is located north of the project site, along Bethuel Road. These residences are surrounded by mature trees. Some residential development is located along Amour Road, south of the project site, and are blocked from the project site from the forested buffer along Casper Creek. Lastly, the single-family homes north of the project site along Kerrville-Rosemark Road have mature trees shielding from the project site.

The general public may see the site features briefly while driving on the adjacent public roads. These visual impacts would be noticed from Bethuel Road, Kerrville-Rosemark Road, Amour Road, and Center College Road. The area's topography is generally flat with gently rolling hills, and some of the tree-lined stream corridors and site boundaries block views of the site from other vantage points.

Because the proposed TL interconnection would be installed within the TL corridor developed and maintained for the Millington I solar facility, minor direct visual impacts associated with the proposed Millington II TL interconnection would occur. The interconnection would be visible from Center College Road and Bethuel Road but result in no noticeable viewshed changes from the current setting. Since the TVA substation upgrades would be constructed within the footprint of the existing substation, no impacts would occur from the modifications.

Overall, the visual alteration from agricultural and undeveloped land to a solar facility is anticipated to result in minor adverse impacts. Visual impacts during the construction phase would be minor in the immediate vicinity, due to some tree buffers around the project boundary. Visual impacts during the project's operational phase would be minor due to terrain and nearby roadways. Vehicles traveling along adjacent roadways including Bethuel Road, Center College Road, Amour Road, Kerrville-Rosemark Road, and Millington Arlington Road would not experience glare or any impacts to driver’s visibility. While views from surrounding properties may be slightly affected, the overall appearance of the solar panels would blend in with the immediate surrounding environment. If required by Shelby County, SR Millington II would make landscape plantings at the county’s discretion surrounding the project site to minimize visual impact.

3.6 NOISE

This section provides an overview of existing noise within and surrounding the Millington II project site and potential impacts to noise associated with the Proposed Action Alternative and No Action Alternative.

3.6.1 Affected Environment

The magnitude and frequency of environmental noise may vary considerably over the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetation cover.

Noise is generally described as unwanted sound, based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is typically measured by the decibel (dB), which expresses the ratio of one value of a physical

property to another on a logarithmic scale. A day-night average sound level of 55 A-weighted decibels (dBA) is commonly used as a threshold level for noise resulting in adverse impacts, and prolonged exposure to levels above 65 dBA is considered unsuitable for residential areas (USEPA, 1974).

The proposed project would be developed on an agricultural and undeveloped, 957-acre project site, in Shelby County, Tennessee. Noise sources in the area are generated from the operation of the Millington-Memphis Airport and the surrounding public roadways.

The project site and a surrounding 0.5-mile radius were examined to identify potential noise-sensitive receptors. Noise-sensitive receptors are defined as those locations or areas where dwelling units of frequent human use occur. There are about 189 structures within a 0.5-mile radius of the project site. The majority of those are single-family homes located north and south of the project site. The closest noise receptor to the project site is located approximately 100 feet from the project boundary along Amour Road. Casper Creek and its associated vegetated buffer falls between this residential property and the project site. There is a larger residential neighborhood about 0.4 miles south of the project, at the intersection of Navy Road and Amour Road. Paws and Claws Rescue and Casper Creek RV Park are located south of Center College Road, directly adjacent to the southernmost portion of the project site. Several single-family homes and Bethlehem Church and Bethlehem Baptist Church are located north of the project site along Bethuel Road. Christ the Savior Church and Rosemark Full Gospel Assembly are located north of the project site, along Center College Road and Kerrville Assembly, respectively. Several single-family residences are located north of the project site along Kerrville-Rosemark Road.

3.6.2 Environment Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, no noise impacts would occur from the construction or operation of the proposed solar facility, and the project would not result in related changes to noise levels in the area. No noise would be generated by the operation of the proposed solar facility.

3.6.2.2 Proposed Action Alternative

Construction noise would cause temporary and short-term adverse impacts to the ambient sound environment near the project site. Nearby residents could experience elevated noise levels caused by construction equipment. Construction equipment typically results in a maximum noise level of 80-90 dBA, dropping to 71-81 dBA at 300 feet, and 50-60 dBA at 1,000 feet. Most of the proposed equipment would not be operating on the site for the entire construction period and at one time but would be phased in and out based on project progress.

The construction work associated with pile driving would be the loudest and occur intermittently during daylight hours. Other construction-related noise such as delivery trucks, dump trucks, water trucks, service trucks, bulldozers, chain saws, bush hogs, and other large mowers for tree clearing would remain under 65 dBA for nearby residences. Work would occur from Monday through Saturday from 7 am to 5 pm. Construction workers would wear appropriate hearing protection in accordance with the Occupational Safety and Health Administration (OSHA) regulations.

Existing ambient noise in the project site consists mainly of sounds from agricultural machinery, traffic sounds from nearby public roadways, and the Millington-Memphis Airport. Following completion of the solar facility, the ambient sound environment is anticipated to return to existing

noise levels or below by eliminating some of the seasonal use of agricultural equipment. The proposed inverters would produce minimal noise for residences more than 1,000 feet from the proposed inverters, and Paws and Claws Rescue approximately 750 feet from the nearest proposed inverters. To avoid noise impacts, all inverters would be at least 750 feet from any nearby development. Some noise may be heightened during seasonal mowing activities.

3.7 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This section describes the existing air quality and GHG emissions in the project site and region and the potential impacts on air quality and GHG emissions associated with the No Action and Proposed Action Alternatives.

3.7.1 Affected Environment

The Clean Air Act (42 U.S.C. §7401 et seq.) mandates protecting and enhancing our nation's air quality resources. National Ambient Air Quality Standards (NAAQS) 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 micrometers (PM_{10})
- Particulate matter whose particles are less than or equal to 2.5 micrometers ($PM_{2.5}$)
- Carbon monoxide (CO)
- Lead

The system-wide emissions from TVA's electrical generating facilities are described in TVA's 2019 Integrated Resource Plan Final Supplemental Environmental Impact Statement (TVA, 2019). TVA has reduced its emissions of criteria pollutants and GHG by installing emission controls at fossil fueled plants, idling, and retiring coal-fired generating units, increased use of low-emission generating facilities, and increased energy efficiency and demand reduction efforts.

3.7.1.1 Air Quality

The primary NAAQS were promulgated to protect public health, and the secondary NAAQS were promulgated to protect 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 in or near these areas may be subject to more stringent air permitting requirements. A listing of the NAAQS is presented in Table 8 (USEPA, n.d. -b). National standards other than annual standards are not to be exceeded more than once per year (except where noted).

Table 8. NAAQS Table

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours 1 hour	9 ppm 35 ppm	Not to be exceeded more than once per year
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary primary and secondary	1 hour 1 year	100 ppb 53 ppb (2)	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary secondary primary and secondary	1 year 1 year 24 hours	12.0 µg/m3 15.0 µg/m3 35 µg/m3	Annual mean, averaged over 3 years Annual mean, averaged over 3 years 98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary secondary	1 hour 3 hours	75 ppb (4) 0.5 ppm	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years Not to be exceeded more than once per year

Abbreviations: ppb = parts per billion, ppm = parts per million, µg/m3 = micrograms per cubic meter

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO2 standards or is not meeting the requirements of a SIP call under the previous SO2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Areas in compliance with the NAAQS are designated “attainment areas.” Areas not in compliance with the NAAQS are designated as “nonattainment areas.” Nonattainment areas are usually defined by county. Areas that cannot be classified based on available information for a specific

pollutant are designated as “unclassifiable” and are treated as attainment areas unless proven otherwise. If an area that was formerly designated as a nonattainment for a particular pollutant later qualifies as attainment, it is then categorized as “maintenance” for that pollutant for the next 20 years (as long as the area continues to meet the NAAQS for that pollutant) before qualifying to be designated to attainment.

Based on available ambient air quality data, the EPA initially designated Shelby County as non-attainment of the 2008 ozone NAAQS in 2012 (USEPA, n.d. -c). Air Quality improvements through 2014 led to the Shelby County Re-designation request and Maintenance Plan in January 2016. In 2016, the EPA determined the County met the requirements of the Clean Air Act to change the designation of Shelby County from non-attainment to attainment (Shelby County Health Department, 2016). Under the 1978 standard, part of the county is listed as maintenance for lead; however, under the 2008 standard, the County was not in nonattainment or maintenance (USEPA 2021d).

The project site is in rural Shelby County and has a combination of agricultural and residential development surrounding the site. Denser development is located south and west in downtown Millington and Memphis. Based on Air Quality Statistics (as of May 5, 2021), Shelby County air quality data is as follows:

- CO 8-hr – Second maximum non-overlapping 8-hour concentration: 1 ppm
- Pb 3-month – Maximum rolling 3-month average: [No data]
- NO_2 AM – Arithmetic mean concentration: 10 ppb
- NO_2 1-hr – Arithmetic mean concentration: 33 ppb
- O_3 8-hr – Fourth daily maximum 8-hour concentration: 0.062 ppm
- PM_{10} 24-hr – Second maximum 24-hour concentration: 64 μgm^3
- $PM_{2.5}$ Wtd AM – Weighted annual mean concentration: 9.1 μgm^3
- $PM_{2.5}$ 24-hr – 98th percentile 24-hour concentration: 20 μgm^3
- SO2 1-hr – 99th percentile daily maximum 1 hour concentration: 2 ppb

3.7.1.2 Regional Climate

Weather conditions determine the potential for the atmosphere to disperse emissions of air pollutants. West Tennessee’s climate is characterized by hot and muggy summers. The winters are cool, wet, and windy. It is partly cloudy year-round.

In the City of Millington, the yearly temperature typically varies from 33°F to 92°F and is rarely below 19°F or above 99°F (Weather Spark, n.d.).

3.7.1.3 Greenhouse Gas Emissions

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. Carbon dioxide, methane, and nitrous oxide are among the most common GHGs emitted from natural processes and human activities.

The primary GHG emitted by human activities in the U.S. is carbon dioxide, representing more than 80 percent of total GHG emissions. Release occurs when carbon dioxide enters the atmosphere through the burning of fossil fuels (coal, natural gas, and oil), solid waste, trees, and wood products and chemical reactions. Carbon dioxide is removed from the atmosphere (or "sequestered") when plants absorb it as part of the biological carbon cycle (USEPA, n.d. -d).

The largest carbon dioxide source and overall GHG emissions is fossil fuel combustion. Agricultural activities, including various management practices (i.e., irrigation, tillage, fertilizer application), can lead to the production and emissions of nitrous oxide (USEPA, n.d. -d).

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. Therefore, no project-related impacts to air quality or climate change would occur as the proposed solar facility would not be constructed. No air pollutants or GHG emissions would be generated by equipment or vehicles from construction or operation of the solar facility. Existing land use would remain a mix of agricultural and rural residential with little effect on climate and air quality.

3.7.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, minor impacts to air quality would occur during the construction of the solar facility. Only minimal air impacts would be expected, as construction might result in localized dust and fumes from equipment. The construction would involve using diesel-powered machinery and thereby create small amounts of airborne dust and debris. Internal combustion engines' emissions associated with diesel fuels would generate local emissions, including carbon monoxide, nitric oxide, and sulfur dioxide during construction (an increase of GHG during construction). Also, during clearing, trees may be burned and result in a minor increase in GHG emissions. The impacts on air quality would be expected to be minimal and short-term.

Approximately 957-acres of the project site would be subject to ground-disturbing activities, including vegetation clearing. Properly implemented control and suppression measures, as well as BMPs and standard erosion control measures, such as reseeding, would minimize potential for wind erosion. Trees and other tall vegetation removed during construction to accommodate the panel layout and TL would represent a minor loss of sequestered carbon, as well as potential future carbon sequestration. Electric-powered equipment such as utility vehicles may be used on the site during operations and maintenance. Minor adverse impacts to air quality and GHGs are anticipated from construction of the proposed solar facility and TVA TL interconnection.

The operation of the solar facility would result in minimal impacts due to maintenance activities such as facility inspections and periodic mowing. However, a minor reduction in GHG emissions is expected as the carbon dioxide-free power generated by the solar facility would displace the need for power which would otherwise be generated in part by fossil fuels. This reduction would result in minor beneficial impacts to air quality (TVA, 2019).

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

3.8 CULTURAL RESOURCES

This section describes an overview of the existing cultural resources within the project site and potential impacts on these cultural resources associated with the Proposed Action Alternative and No Action Alternative.

3.8.1 Affected Environment

Cultural resources are prehistoric and historic archaeological sites, districts, buildings, structures, and objects, as well as locations of historic events of importance. Cultural resources listed or determined to be eligible for listing on the National Register of Historic Places (NRHP) maintained by the National Park Service are considered historic properties (NPS, 2017). As a federal corporate agency, TVA is required by Section 106 of the National Historic Preservation Act (NHPA) to evaluate the potential effects of its actions on historic properties (36 CFR Part 800). When a TVA action would adversely affect a historic property, TVA must, in consultation with state historic preservation officers, federally recognized Indian tribes, and other stakeholders, consider ways to avoid or minimize the adverse effect. If avoidance or minimization are not feasible, measures to mitigate the adverse effect must be taken.

In accordance with Section 106 of the NHPA, a Phase I cultural resource survey to document and assess resources located within the survey area associated with the proposed project was conducted by Tennessee Valley Archaeological Research (TVAR). The archaeological survey area consisted of the 965-acre project site where the solar array is proposed for construction. The Area of Potential Effects (APE) for the architectural study consisted of the project site, in addition to areas visually connected to it via viewshed to and from the project site within a 0.5-mile radius. Areas within the architectural survey radius that were determined not to be within view of the proposed undertaking due to terrain, vegetation, and/or modern built environments were not considered part of the architectural APE.

Portions of the project area were previously investigated on behalf of TVA by TVAR in 2017. To accommodate Silicon Ranch's solar array, TVA would construct a segment of TL to connect the Millington II solar array to the Shelby-Drummonds TL. The 1.6-acre easement where this point-of-intersection (POI) would be installed is adjacent to the southwestern corner of the current archaeological survey area and is entirely within the area surveyed by TVAR in 2017 (Rosenwinkel et al., 2017). Consequently, no additional testing is required within the POI easement because it was previously studied by TVAR in 2017. The architectural APE consisted of a 0.8-kilometer (0.5-mile) radius surrounding the solar array's footprint. Areas within the survey radius that were determined not to be within view of the solar array due to terrain, vegetation, and/or modern built environments were not considered part of the APE.

The survey was conducted to provide an inventory of resources within the survey area, descriptions of the condition of any resources identified, and evaluation of NRHP eligibility. All work was consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, and Restoring & Reconstructing Historic Buildings (NPS, 2017) and met the Tennessee SHPO Standards and Guidelines for Archaeological Resource Management Studies (TDEC, 2018).

TVAR conducted a field survey of historic architectural resources on August 3, 2021. The survey assessed three previously recorded resources and three new resources. Two of the three previously recorded architectural resources (SY-32631 and SY-IP-000) are commonly styled homes of diminished integrity. They have no historical or architectural significance. TVA

determined they are not eligible for NRHP listing under Criteria A, B, and C and Criteria Consideration D.

The third site, the St. James Cemetery (SY-32112), may have historical or architectural significance. TVA recommended the St. James Cemetery (SY-32112) ineligible for the NRHP. The Tennessee Historical Commission (THC) disagreed with TVA's determination and stated St. James Cemetery may be eligible for NRHP listing under Criterion A, pending further archival research. THC agreed with TVA that by implementing the agreed to 20-meter avoidance area, the project would not adversely affect St. James Cemetery should it be determined eligible.

The survey recorded three new historic architectural resources: two concrete T-beam bridges (SYIP-00002 and SY-IP-00003) and a brick single-family ranch house (SY-IP-00004). TVA determined they are not eligible for NRHP listing due to lack of historical significance.

Archaeological fieldwork was conducted between July 26 and November 17, 2021. During this fieldwork, 98 cultural resources were investigated within the project area including one cemetery (Saint James Cemetery), seven previously identified sites, 19 newly recorded sites, 13 non-site cultural resources, and 58 isolated finds. Previously unidentified site 40SY427 and newly recorded sites 40SY908 and 40SY917 warrant an NRHP eligibility status of undetermined. TVAR recommends avoidance of these three sites pending additional archaeological investigations to better ascertain the NRHP eligibility statuses of these resources.

The 9 non-site cultural resources and 58 isolated finds lack significant research potential beyond the findings of the Phase I survey and are not eligible for listing on the NRHP. TVAR recommends that no further archaeological investigations of the 9 non-site cultural resources or 58 isolated finds are necessary in connection with the proposed project.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, the existing land use would be expected to remain unchanged. Therefore, no impacts to cultural resources would occur as the site would not be developed as a solar facility.

3.8.2.2 Proposed Action Alternative

As the St. James Cemetery is physically located within the proposed project boundary and may be eligible for NRHP listing, TVA determined that maintaining at least a 20-meter buffer around the resource would comply with state preservation laws and maintain the integrity of the cemetery should it be determined eligible. Per the May 3, 2022 Letter Agreement between TVA and SR Millington II, SR Millington II agrees that no disturbance of sites 40SY427, 40SY908, and 40SY917 will occur for the entire 20-year term of the PPA without TVA's prior review and consultation with the SHPO and federally recognized Indian tribes in accordance with applicable federal regulations. The project would adhere to buffering and avoiding the sites. SR Millington II and TVA have an agreement letter in place to avoid these sites and provide the TVAR-recommended buffers during construction and operation of the project for the life of the PPA. The 9 non-site cultural resources and 58 isolated finds lack significant research potential beyond the findings of the Phase I survey and are not eligible for listing on the NRHP.

The Proposed Action Alternative would not impact any listed or eligible NRHP archaeological sites. TVA has also consulted with federally-recognized Indian tribes regarding properties within the proposed project's APE that may be of religious or cultural significance to them, or eligible for

the NRHP. On March 21, 2022, the Tennessee State Historic Preservation Office (SHPO) concurred with TVA's determination. TVA determined that by implementing the agreed to 20-meter avoidance area, the project would not adversely affect St. James Cemetery should it be determined eligible. The consultation documentation is included in Appendix G.

Should previously undiscovered cultural resources be identified during construction or operations, TVA would contact and consult with the SHPO and relevant federally recognized Indian tribes before further action is taken. If human remains are encountered or accidentally uncovered by earthmoving activities, all activity within the immediate area must cease. The county coroner or medical examiner, a local law enforcement agency, and the state archaeologist's office would be immediately notified.

3.9 SOLID AND HAZARDOUS WASTES

This section describes an overview of existing waste management (solid and hazardous waste) within the project site and potential impacts to waste management associated with the No Action Alternative or Proposed Action Alternative.

3.9.1 Affected Environment

An ASTM standard E1527-13 Phase I Environmental Site Assessment (ESA) was performed on the site in March 2021 and resulted in the following findings:

- The GeoSearch Radius Report identified a Superfund Enterprise Management System (SEMS) Archive site and Resource Conservation and Recovery Act (RCRA) corrective action (CORRACTS) facility, the Navy Support Activity Mid-South, located approximately 500 feet to the southwest of the western-most parcel.
- The subject property was not identified in the findings.

The SEMS Archive status is "No further remedial activity is planned". According to the EPA RCRA information page for the facility, the human exposure control status is "controlled" as of 2001 and ground water migration is "controlled" as of 2005. Based on the current regulatory status and relative topographic positioning, this facility does not represent an environmental concern relative to the site. Further, no underground or above ground storage tanks were observed on the site at the time of the site reconnaissance, nor identified on surrounding properties.

The portion of the project site associated with the TL south of Center College Road was not identified in the findings. Based on the available information in records research, understating of past and current operations, and site reconnaissance no Recognized Environmental Conditions (REC) were identified. No further investigation is recommended.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the No Action Alternative, no project-related impacts associated with solid and hazardous waste would occur. Existing land use would be expected to remain agricultural.

3.9.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, construction activities and facility operation would generate solid waste. Oily rags, worn or broken metal and machine parts, defective or broken electrical materials, other scrap metal and plastic, broken down module boxes, empty containers, paper, glass, and other miscellaneous solid wastes would be generated throughout all phases of the proposed project. Waste would be disposed of utilizing contracted refuse collection and

recycling services. All applicable federal, state, and local regulatory requirements would be followed in the collection and disposal of waste to minimize health and safety effects. Decommissioned equipment and materials, including PV panels, racks, and transformers, would be recycled. Materials that cannot be recycled would be disposed of at an approved facility in accordance with applicable local, state, and federal laws and regulations.

Based on the findings of the Phase I ESA, the proposed project site has no REC. No hazardous waste would be generated during the construction and operation of the facility. During construction of the proposed solar facility, materials would be stored on site in storage tanks, vessels, or other appropriate containers specifically designed for the characteristics of these materials. Fuel for construction vehicles may be stored on site during construction. An SPCC plan would be developed and implemented to minimize the potential of a spill and to provide detailed instructions for onsite personnel on how to contain and clean up any potential spills. Hazardous materials stored on site would not be available to the public. Fueling of construction vehicles would occur within the construction area. During construction and operation of the facility, any materials determined to be wastes would be evaluated (e.g., waste determinations) and managed (e.g., inspections, container requirements, permitted transport, and disposal) in accordance with the Solid and Hazardous Wastes Rules and Regulations of the State of Tennessee (TDEC DSWM Rule 0400 Chapters 11 and 12, respectively). The TVA substation upgrades would occur within the existing substation footprint. All applicable local, state, and federal regulatory requirements would be followed, and waste would be properly disposed of should the upgrade be completed.

Procedures to limit fuel spills would be implemented during construction and operation of the facility. Details regarding the handling of fluid spills and general trash would be included in the SWPPP and SPCC. Spills would be managed following standard procedures for spill prevention and cleanup and waste management protocols in accordance with pertinent federal, state, and local requirements. Waste generated during operation would be minimal and would mainly result from the replacement of equipment. Nonhazardous wastes would be disposed of in an approved, operating landfill. Bulk chemicals would be stored in storage tanks or in returnable delivery containers. The transport, storage, handling, and use of all chemicals would be conducted following applicable local, state, and federal laws, ordinances, regulations, and standards.

Upon expiration of the 20-year PPA or an amended or alternative PPA for the sale of power after the 20-year period, SR Millington II would develop a decommissioning plan to document the recycling and/or disposal of solar facility components in accordance with applicable local, state, and federal laws and regulations. Impacts from the generation of hazardous waste during the construction and operation of the proposed facility would be insignificant.

3.10 PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY

This section provides an overview of existing public health and safety at the project area and the potential impacts to public health and safety associated with the No Action Alternative and Proposed Action Alternatives. Analyzed issues include emergency response and preparedness and occupational or worker safety in compliance with OSHA.

3.10.1 Affected Environment

The project site is currently private property, an agricultural and rural-residential area. Public emergency services in the area include urgent care clinics, hospitals, law enforcement services, and fire protection services. A brief description of the public emergency services relative to the project location is provided below:

- Shelby County Fire Department Station 64, 6457 Navy Rd, Millington, TN – approximately less than 1 mile south from the site
- Shelby County Fire Department Station 69, 7365 Brunswick Rd, Arlington, TN – approximately 5 miles southeast from the site
- Primary Healthcare of Millington, 4772 Navy Road, Millington TN – approximately 6 miles southwest from the site
- Fast Pace Health Urgent Care – Millington, 8188 Highway 51 N, Millington, TN – approximately 6 miles west from the site
- Urgent Team Walk-in Urgent Care - Bartlett, 8350 Hwy. 64 103, Bartlett, TN – approximately 15 miles southeast from the site
- Regional One Health Medical Center, 877 Jefferson Avenue, Memphis TN – approximately 23 miles southwest from the site
- Shelby County Office of Preparedness and Homeland Security, 1075 Mullins Station Road, Building C, Memphis, TN – approximately 20 miles south from the site

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no project-related impacts on public health and safety would result. Existing land use would remain primarily agricultural. No changes to existing public health and safety would occur.

3.10.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, workers on the project site would have an increased safety risk during construction. However, standard construction site practice includes the establishment and maintenance of health and safety plans to comply with OSHA regulations. Health and safety plans emphasize BMPs for site safety to minimize risk to construction staff. These plans may include use of personal protective equipment, regular safety inspections, use of equipment guards, and establishment of emergency shutdown procedures.

Fuel for construction vehicles may be stored on site during construction. An SPCC plan would be developed and implemented to minimize the potential of a spill and to provide detailed instructions for onsite personnel on how to contain and clean up any potential spills. Hazardous materials stored on site would not be available to the public. Emergency response for any potential incidents on the project site would be provided by the local, regional, and state law enforcement, fire, and emergency responders.

Potential public health and safety hazards could result in increased traffic on nearby roadways due to construction of the site. Communication of increased industrial traffic and establishment of traffic procedures to minimize potential safety concerns would be addressed in the health and safety plans followed by the construction contractor. No impacts to public and occupational health would be anticipated to occur from the proposed TVA TL interconnection. No public health or safety hazards would be anticipated to occur as a result of the construction of the Proposed Action Alternative.

3.11 TRANSPORTATION

This section describes roadways and other transportation infrastructure serving the project site and surrounding area and potential impacts on transportation associated with the No Action Alternative and Proposed Action Alternative.

3.11.1 Affected Environment

The proposed project site is located east of the City of Millington in unincorporated Shelby County. It is bound in part by Gunn Road on the north, Kerrville-Rosemark Road on the northeastern-most portion, by Center College Road on the southwest, and Bethuel Road on the western-most portion. The regional character is mostly rural, with agricultural and pasture fields and some forested areas. The site is immediately surrounded by agricultural fields and residential development comprised of single-family homes. The Millington-Memphis Airport is approximately 0.9 miles west of the site, west of Millington I solar facility.

There are multiple existing Tennessee Department of Transportation (TDOT) two-directional count traffic stations adjacent to and in the vicinity of the project site to provide traffic volume at nearby intersections; these traffic counts are listed in Table 9 below.

Table 9. Average Annual Daily Traffic Counts

Station Identification	Station Location	2020 traffic count
Station 000551	On Navy Road/County Road 205 west of Bethuel Road junction south of the site	6,120
Station 000010	On Armour Road south of junction with Aycock Road and site	1,553
Station 000428	On Center College Road north of junction with Gunn Road	214
Station 000009	Millington – Arlington Road/County 205 south from the project site	1027
Station 000007	Along Kerrville-Rosemark Road east of Donnell Road northeast from the site	438
Station 000655	Along Austin Peay Hwy at Crooked Creek Drainage Canal, south of the project site, north from Paul W. Barret Pkwy/Route 365	6,605

Source: (TDOT, n.d.)
https://tdot.public.ms2soft.com/tcds/tsearch.asp?loc=Tdot&mod=TCDS

The values provided are annual average daily traffic (AADT) volumes. AADT volumes are based on a 24-hour, two-directional count at a given location. The raw traffic data is mathematically adjusted for vehicle type, determined by an axle correction factor. The data is then statistically corrected by the seasonal variation factor that considers time of year and day of the week.

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. Therefore, no project-related impacts on transportation resources would result. Existing land use would be expected to remain a mix of farmland and unused land. The existing transportation network and traffic conditions would be expected to remain as they are at present.

3.11.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the construction and operation of the proposed solar facility would not affect the operation of the nearby Millington-Memphis Airport located approximately 0.9 miles west of the site, west of the existing Millington I solar facility. The distance between the airport and the proposed solar facility, coupled with the existing solar facility and roadways between the airport and project site, serve to minimize any effects the construction of the proposed solar facility may have on air transportation.

During construction of the solar facility, a maximum of 250 workers would be present at the site from 7am to 5pm, 6 days a week (Monday through Saturday) for approximately 12 months. A majority of the workers would likely come from the local or regional area; 25 to 50 percent of the workforce would be supervisory personnel that would likely come from out of state and many would stay in local hotels near or within Millington, Tennessee. Workers would either drive their own vehicles or carpool to the project site. Parking would be on site during the day. Some work teams may visit local restaurants and businesses during work hours. Additional traffic due to deliveries and waste removal would consist of a maximum of approximately 15 vehicles per day during construction.

Traffic flow around the work site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. Deliveries and most workers would access the project site from the four entrances off Center College Road and one entrance off Armour Road. No major industries are located at the site access points. Should traffic flow be a problem for local residences or businesses, SR Millington II would consider staggered work shifts to space out the flow of traffic to and from the project site. Use of such mitigation measure would minimize potential adverse impacts to traffic and transportation to less than significant levels. SR Millington II would obtain any required TDOT permits to accommodate delivers of panels and construction and substation equipment.

Several onsite 16 to 20-foot-wide paved maintenance roads would be constructed and maintained on the project site. These roadways would serve as periodic access for site inspection and maintenance and be closed for through traffic. No impacts to transportation are anticipated from the proposed TVA substation upgrades.

The proposed solar facility would not be manned during operation; however, maintenance would be required quarterly and for equipment failures and would require minimal personnel. Therefore, the operation of the solar facility would not have a noticeable impact on local roadways. Overall, the Proposed Action would not result in indirect impacts to transportation.

If the site were to be decommissioned, traffic resulting from waste removal activities would be temporary and short-term. Should substantial traffic occur near the project site access locations, SR Millington II, or its contractor, would implement staggered work shifts to assist traffic flow near the project site access locations to minimize potentially adverse impacts to traffic and transportation levels.

3.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section describes an overview of existing socioeconomic conditions and environmental justice considerations associated with the No Action Alternative and Proposed Action Alternative.

3.12.1 Affected Environment

EO 12898 on Environmental Justice directs federal agencies to consider the impacts of their actions on minority and low-income populations and avoid disproportionate impacts to those populations. The proposed project site has been actively farmed, is partially wooded, and is in a rural area of Shelby County located east of the City of Millington. The site is surrounded by agricultural fields and residential development comprised of single-family homes. Based on U.S. Census data available through the EPA's EJSCREEN, 2,175 people live within a 1-mile radius of the project site, approximately 0.02 percent of the Shelby County population of 937,166 (U.S. Census Bureau, 2019). Tables 10 and 11 below provide a breakdown of the relevant population, income, and poverty data. Since the proposed project site falls adjacent to Millington city limits, the population, income, and poverty data for Millington are provided for comparison and reference.

Table 10. Project Site Population

MILLINGTON II SOLAR PROJECT POPULATION DATA					
	Population	**Minority Population**			
Geography	Total	White	Percent White	Minority	Percent Minority
Tennessee	6,829,174	5,019,442	73.5%	1,809,731	26.5%
Millington, TN	10,641	6,884	64.7%	3,756	35.3%
Shelby County, Tennessee	937,166	383,300	40.9%	553,866	59.1%
1-Mile Radius - Project Site	2,175	1,573	72%	602	28%

Sources:

*U.S. Census Bureau. Quick Facts, July 1, 2019. Accessed September 14, 2021. https://www.census.gov/quickfacts/fact/table/millingtoncitytennessee,TN,shelbycountytennessee/PST045219.

*USEPA. EJSCREEN. Accessed September 14, 2021. Available at: https://ejscreen.epa.gov/mapper/

The recorded population within the 1-mile radius is predominantly white, with 72 percent reporting race as white and 28 percent minority (USEPA, 2020). The reported minority population within the 1-mile radius is about 31.1 percent lower than the Shelby County minority population of 59.1 percent, which is higher than Tennessee's 26.5 percent minority population.

Within one mile of the project site, a slightly lower per capita income of $26,664 has been reported as compared to Shelby County's per capita income of $30,104 and $28,837 for Millington. While median household income is not reported at this level through EJSCREEN, it is noted that the median household incomes within Shelby County and Millington are $51,567 and $52,500 respectively are less than the state average and the nation as a whole ($53,320 and $64,994, respectively). It is likely that the median household income within one mile of the project site is slightly lower than the median Shelby County household income of $51,657. Further analysis using data from the U.S. Census Bureau's website found that the there are no minority populations based on race or income (U.S. Census Bureau n.d. -a, -b).

Table 11. Project Site Income and Poverty

MILLINGTON II SOLAR PROJECT INCOME AND POVERTY DATA						
	Median and Per Capita Income			Poverty Level		
Geography	Total Households	Median Household income	Per Capita income in the past 12 months	Population for whom poverty status is determined	Population below poverty level	Percent below poverty level
Tennessee	2,597,292	$53,320	$29,859	13.90%	1,024,376	13.9%
Millington, TN Metro Area	4,136	$52,500	$28,837	21.80%	1,979	18.6%
Shelby County, Tennessee	351,194	$51,657	$30,104	14.40%	161,192	17.2%
1-Mile Radius - Project Site	677	N/A	$26,664	N/A	N/A	29%

Sources:

*U.S. Census Bureau. American Fact Finder; 2018 ACS 5-year estimates. Accessed September 14, 2021. https://factfinder.census.gov/faces/nav/jsf/pages/index/xhtml.

*USEPA. EJSCREEN. Accessed September 14, 2021. Available at: https://ejscreen.epa.gov/mapper/

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. Therefore, no project-related socioeconomic impacts within Shelby County would occur. Further, no disproportionate impacts to the low-income or minority populations near the project site would occur.

3.12.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the proposed solar facility would be constructed. Approximately 250 workers would be employed during construction, lasting approximately 12 months. Some of the hired workforce would be based in the local area, leading to a short-term beneficial impact on the local economy. Approximately 25 to 50 percent of the workforce may be traveling from out of state, depending on availability of local labor force.

No impacts to socioeconomics or environmental justice would occur from the proposed TVA substation and TL modifications. Based on EPA's Environmental Justice Screen (EJScreen), all regional percentiles for environmental justice indices are less than the state and US percentiles. For socioeconomic indicators, the EJScreen shows the regional percentiles comparable to the state and US percentiles.

Operation of the facility would not increase local employment as no workers would be needed for day-to-day operation of the solar facility. While periodic maintenance activities, primarily mowing, would be done by local workers, this would not increase employment. Although it is too early to quantify, the project would benefit the local tax base.

When compared to county data, there is a much lower concentration of minority population near the project and is nearly consistent with the state concentration. While there is what would potentially be considered low-income population concentration near the project site, the overall impacts of the solar facility, most of which would occur during the estimated 12-month construction period, would be minor. The offsite impacts (i.e., to surrounding properties) would be negligible. Consequently, there would be no disproportionately adverse impacts to minority and low-income populations.

3.13 CUMULATIVE IMPACTS

CEQ regulations define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR § 1508.7 issued in 1978). Therefore, cumulative impacts should be considered early in the project development process, as identification of potential cumulative impacts may assist in the design and selection of alternatives and mitigation measures to minimize a project's environmental impacts.

This section addresses the cumulative impacts of the Project and any reasonably foreseeable action in the vicinity. This section addresses other projects with possible land use, water resources, visual, geological resources and farmlands, noise, and air quality impacts.

A desktop research of potential past, present, and future actions in the Shelby County, TN, area was conducted. Resources examined included:

- TDOT transportation projects
- TVA environmental reviews website
- Local and regional news sources
- Shelby County and City of Millington government website records

The Memphis Metropolitan Planning Organization 2020-2023 Transportation Improvement Program (Memphis MPO, n.d.) was reviewed for potential present and future actions within the vicinity of the project site. No projects within the vicinity of the proposed solar facility were identified. Similarly, there are no road projects identified in TDOT's Transportation Improvement Plan for 2022-2024 in the vicinity of the proposed solar facility.

Based on a review of available Shelby County planning and zoning information, Land Bank-Properties for Sale, and the Millington Industrial Development Board, no known recent or planned state and local projects are in the project site vicinity. Therefore, no adverse cumulative impacts have been identified. No major roadway improvement projects or development projects were identified within the vicinity of the proposed solar facility in the comprehensive plan.

There is one other solar farm within a 10-mile radius of the proposed project. The Millington I project is adjacent to the west boundary of the proposed project. Millington I is 438-acre solar farm with 390 acres of solar panels that generates 53 MW AC. It was completed in 2018. The solar facility was constructed and is operated by SR Millington, LLC. SR Millington entered a 20-year PPA with TVA to purchase the electric power generated by the facility. The project connects to the TVA electrical transmission network via a new onsite substation and a new TVA 161-kilovolt (kV) TL (called the Shelby-Millington Solar 161-kV TL). The Millington I project is an independent utility from the Millington II project. The project also provides energy security to the adjacent Naval Support Activity (NSA) Mid-South facility via a new 12.47-kV distribution line paid for and constructed by SR Millington, LLC to connect from the new onsite substation to the NSA Mid-South facility network.

The proposed project has the potential to contribute to cumulative impacts on land use in the area. The solar farms would temporarily change the land use in the area from agricultural and undeveloped to industrial during the length of the PPA. Given the high proportion of the county in agricultural and forestry land use and small proportion in industrial land use, this cumulative

impact would be small. No other solar farms are located within a 10-mile radius around the proposed project.

A portion of the identified Millington II property boundary may be developed for a future solar facility. This potential future solar facility project is reasonably foreseeable and would affect land use, water resources, geological resources and farmlands, visual resources, noise, and air quality, as well as threatened and endangered species and other resources.

Based on the information above, the proposed Millington II Solar Facility project is expected to result in minor direct impacts; and is unlikely to result in significant cumulative impacts to these resources and to the project area.

CHAPTER 4

4.0 LIST OF PREPARERS

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CHAPTER 5

5.0 REFERENCES

ArcGIS. (n.d.) *Northern Long-eared Bat Buffers in Tennessee.* https://www.arcgis.com/home/webmap/viewer.html?webmap=ed3d08139be74f45b4f1eb6da4bfbb6f&extent=-89.1378,33.9324,-81.0244,37.6777

Capitol Airspace Group. (2021). *SR Millington II Solar Project Glint & Glare Analysis*.

Cornell University. (2020). *All About Birds: American Kestrel*. Cornell Lab of Ornithology, Cornell University. https://www.allaboutbirds.org/guide/Red-headed_Woodpecker/overview#

Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat With 4(d) Rule, 80 Fed. Reg. 17974-18033 (April 2, 2015) (to be codified at 50 CFR Part 17).

Executive Order 11988, Floodplain Management, 3 C.F.R. (1977). Federal Emergency Management Agency (FEMA). (n.d.). *Flood Map Service Center*. https://msc.fema.gov/portal/home

Kurta, A., Murray, S.W., & Miller, D.H. (2002). Roost selection and movements across the summer landscape. In A. Kurta and J. Kennedy (Eds.). *The Indiana Bat: Biology and Management of an Endangered Species.* (pp. 118-129) Bat Conservation International. https://doi.org/10.1644/1545-1542(2005)086<0212:BR>2.0.CO;2

Memphis Metropolitan Planning Organization (MPO). (n.d.). FY 2020-2023 Transportation Improvement Program (TIP). https://memphismpo.org/plans/fy-2020-23-transportation-improvement-program

National Park Service (NPS). (2017). The *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, and Restoring & Reconstructing Historic Buildings.* https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf

NatureServe. (n.d.). *NatureServe Explorer*. http://explorer.natureserve.org

Rodbell, D.T., Forman, S.L., Pierson, J., & Lynn, W.C. (1997). Stratigraphy and chronology of Mississippi Valley loess in western Tennessee. *GSA Bulletin (109)*(9), 1134-1148. https://doi.org/10.1130/0016-7606(1997)109%3C1134:SACOMV%3E2.3.CO;2

Rosenwinkel, H., Karpynec, T., Weaver, M., Medeiros, C., & Crook, E. (2017). A Phase I Cultural Resources Survey of the Tennessee Valley Authority's Planned Shelby-Drummonds Transmission Line in Millington, Shelby County, Tennessee.

Shelby County Health Department (2016, June 28). EPA Re-Designated Shelby County in Attainment. https://www.shelbycountytn.gov/DocumentCenter/View/26136/NEWS-RELEASE--EPA-Re-Designates-Shelby-County-in-Attainment-6-28-16?bidId=#:~:text=EPA%20Re%2DDesignates%20Shelby%20County%20in%20Attainment&text=The%20re%2Ddesignation%20indicates%20the,most%20recent%20standard%20to%20date

Paleontological Society. (n.d.). PaleoPortal. http://paleoportal.org/

Tennessee Department of Conservation TDEC. (2012). *Tennessee Erosion and Sediment Control Handbook*. https://tnepsc.org/TDEC_EandS_Handbook_2012_Edition4/TDEC%20EandS%20Handbook%204th%20Edition.pdf

TDEC. (2012). *Tennessee Erosion and Sediment Control Handbook*. Fourth Edition. https://tnepsc.org/TDEC_EandS_Handbook_2012_Edition4/TDEC%20EandS%20Handbook%204th%20Edition.pdf

TDEC. (2018). Tennessee SHPO Standards and Guidelines for Archaeological Resource Management Studies. https://www.tn.gov/content/dam/tn/environment/archaeology/documents/arch_TNSHPO.pdf

TDEC. (n.d. -a). *NPDES Stormwater Construction Permit.* https://www.tn.gov/environment/permit-permits/water-permits1/npdes-permits1/npdes-stormwater-permitting-program/npdes-stormwater-construction-permit.html

TDEC. (n.d. -b). Rare Data Viewer. https://dataviewers.tdec.tn.gov/pls/enf_reports/f?p=9014:3:118904174220701:::::

Tennessee Department of Transportation (TDOT). (n.d.) *Transportation Data Management System* https://tdot.public.ms2soft.com/tcds/tsearch.asp?loc=Tdot&mod=TCDS

Tennessee Valley Authority (TVA). (2011). Integrated Resource Plan. https://www.nrc.gov/docs/ML1217/ML12171A189.pdf

TVA. (2014). *TVA Solar Photovoltaic Projects Final Programmatic Environmental Assessment*. at https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-document-library/site-content/environment/environmental-stewardship/environmental-reviews/tva-solar-photovoltaic-projects/pv-final-pea-solar-pv-reduced-size.pdf?sfvrsn=5b15a107_2

TVA. (2015). 2015 Integrated Resource Plan. https://www.tva.com/environment/environmental-stewardship/integrated-resource-plan/2015-integrated-resource-plan

TVA. 2019. 2019 Integrated Resource Plan Final Supplemental Environmental Impact Statement. https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-document-library/site-content/environment/environmental-stewardship/irp/2019-documents/tva-2019-integrated-resource-plan-volume-i-final-resource-plan.pdf?sfvrsn=44251e0a_4

U.S. Army Corps of Engineers (USACE). (2010). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0*). https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1046490.pdf

U.S. Census Bureau. (2019) *Quick Facts, Millington City, TN.*, July 1, 2019. https://www.census.gov/quickfacts/fact/table/millingtoncitytennessee,TN,shelbycountytennessee/PST045219

U.S. Census Bureau. (n.d. -a). Hispanic or Latino Origins by Race. https://data.census.gov/cedsci/table?q=B03002%3A%20HISPANIC%20OR%20LATINO%20ORIGIN%20BY%20RACE&g=0500000US47157_1500000US471570202102,471570207001&y=2020&tid=ACSDT5Y2020.B03002

U.S. Census Bureau. (n.d. -b). Ratio of Income to Poverty Level in the Past 12 Months. https://data.census.gov/cedsci/table?q=C17002&g=0500000US47157_1500000US471570202102,471570207001&y=2020

U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). (n.d. -a). *Web Soil Survey* http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

USDA NRCS. (n.d. -b). *Farmland Protection Policy Act*. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/?ss=16&navtype=SUBNAVIGATIO%20N&cid=nrcs143_008275&navid=100170180000000&position=Welcome.Html&ttype=%20detail.

USDA NRCS. (n.d. -c). Soil Data Access (SDA) Prime and other Important Farmlands. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1338623.html

U.S. Environmental Protection Agency (USEPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. https://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.PDF

USEPA. (2020). Environmental Justice Screening and Mapping Tool. https://ejscreen.epa.gov/mapper/

USEPA. (n.d. -a). *Interactive Map of Sole Source Aquifers*. https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b

USEPA. (n.d. -b). *NAAQS Table*. https://www.epa.gov/criteria-air-pollutants/naaqs-table

USEPA. (n.d. -c). *Nonattainment Areas for Criteria Pollutants (Green Book).* https://www.epa.gov/green-book

USEPA. (n.d. -d). *Overview of Greenhouse Gases.* https://www.epa.gov/criteria-air-pollutants/naaqs-tablehttps://www.epa.gov/ghgemissions/overview-greenhouse-gases

U.S. Fish and Wildlife Service (USFWS). (2020). *Range-Wide Indiana Bat Survey Guidelines.* https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/FINAL%20Range-wide%20IBat%20Survey%20Guidelines%203.23.20.pdf

USFWS. (n.d. -a). *Information for Planning and Conservation (IPaC).* http://ecos.fws.gov/ipac/

USFWS. (n.d. -b). *Indiana Bat Sites in Tennessee.* chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.fws.gov/sites/default/files/documents/indiana_bat_8_16_19.pdf)

USFWS. (n.d. -c). *Environmental Conservation Online System: Species Profile for Northern Long-Eared Bat (Myotis septentrionalis).* https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=9045

USFWS. (n.d. -d). *Environmental Conservation Online System: Species Profile for Indiana Bat (Myotis sodalis)*. https://ecos.fws.gov/ecp/species/5949

U.S. Geological Survey (USGS). 1995. *Ground Water Atlas of the United States; Segment 10 Illinois, Indiana Kentucky, Ohio, Tennessee* https://pubs.usgs.gov/ha/730k/report.pdf

USGS. Seismic Hazard Maps and Site-Specific Data. (n.d.). https://www.usgs.gov/programs/earthquake-hazards/seismic-hazard-maps-and-site-specific-data

U.S. Water Resources Council. 1978. Floodplain Management Guidelines for Implementing E.O. 11988. https://www.ncpc.gov/docs/EO_11988_Implementing_Guidelines_1978.pdf

Weather Spark. (n.d.). Average Weather in Millington, Tennessee, Untied States. https://weatherspark.com/y/12535/Average-Weather-in-Millington-Tennessee-United-States-Year-Round