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SR CANADAVILLE SOLAR

ENVIRONMENTAL ASSESSMENT

Fayette 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
CEC	Chickasaw Electric Cooperative
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dBA	A-weighted decibel
DC	direct current
DFR	digital fault recorder
EA	Environmental Assessment
ECD	Erosion Control Devices
EMC	Electric Membership Cooperative
EO	Executive Order
ESA	Environmental Site Assessment
E-TRIMS	Enhanced Tennessee Roadway Information Management System
FAA	Federal Aviation Administration
FCL	fiber communication line
FEMA	Federal Emergency Management Agency
FFRMS	Federal Flood Risk Management Standard
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
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
PMU	phasor measurement unit
PPA	power purchase agreement
PSS	Palustrine Scrub-Shrub (wetland type)
PUB	Palustrine Unconsolidated Bottom (wetland type)
PV	photovoltaic
ROW	right-of-way
SCADA	Supervisory Control and Data Acquisition
SGHAT	Solar Glare Hazard Analysis Tool
SHPO	State Historic Preservation Officer
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SRC	Silicon Ranch Corporation
SR Canadaville	SR Canadaville, 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 Canadaville Solar, LLC (SR Canadaville), a wholly-owned subsidiary of Silicon Ranch Corporation (SRC), 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 Canadaville is proposing to develop a 16 megawatt (MW) alternating current (AC) solar PV facility located approximately 0.5 miles southeast of the intersection of SR-196/Chulahoma Road and SR-193/Macon in Fayette County, Tennessee (Figure 1). The project site for this Environmental Assessment (EA) is a 223-acre property (Figure 2). The proposed facility would occupy approximately 157 acres of the roughly 223-acre subject property, owned by SRC, and leased to SR Canadaville for the proposed project duration.

While the facility's design is being finalized, the conceptual solar facility plan includes monofacial solar modules comprised of approximately 48,702 individual panels arranged over approximately 157 acres of the 223-acre project site. 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. The project would consist of multiple parallel rows of PV panels on single-axis tracking structures, direct current (DC) to alternating current (AC) inverters, and seven transformers.

A new Canadaville 13-kilovolt (kV) solar generation substation would be constructed by SR Canadaville on the project site. The substation would provide 16 megwatts (MW) of generation at the point of interconnection from the project site to the existing Canadaville, Tennessee, 161 kV Substation northwest of the project site. The new substation will include six, three phase transformers and a 13 kV breaker and associated switches for 22.5 mega volt-amps (MVA) of power flow connection. Chickasaw Electric Company (CEC) would install two new 13 kV bays with breakers and switches within the existing Canadaville Substation. CEC would also install a new control building to house control equipment. The existing substation is adjacent to the northwest corner of the subject property connecting at structure 379 on the existing Cordova-Diffee 161 kV transmission line (TL) adjacent to the north side of the subject property. Additionally, TVA would install new telecommunications and protective relaying equipment within the CEC-owned house to be built at the existing Canadaville Substation. CEC would install seven miles of fiber communication line (FCL) to existing TL poles along the existing right-of-way (ROW) for communications purposes. Under the PPA, SR Canadaville would fund, build, own, and operate the solar energy facility and substation.

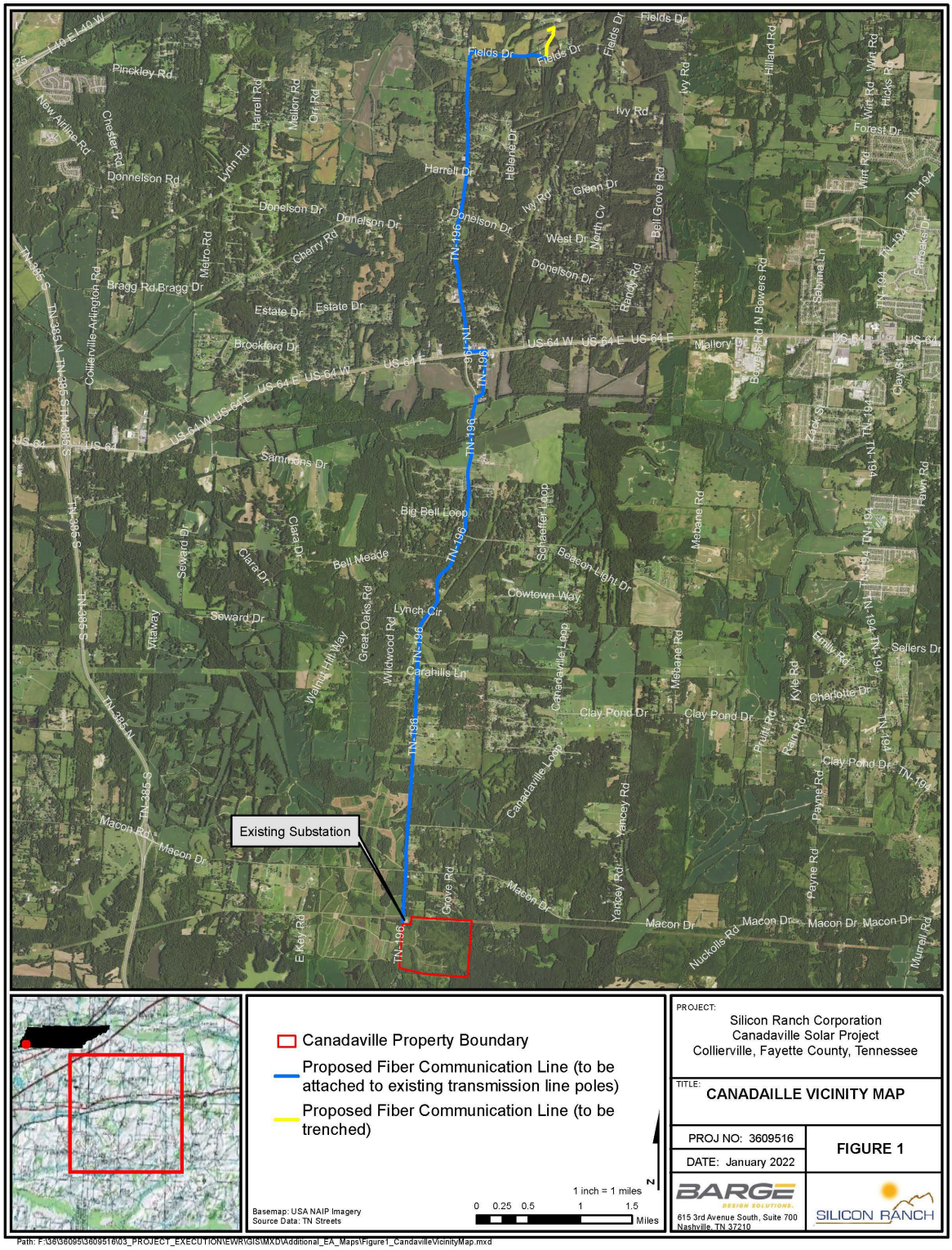

Figure 1. Canadaville Vicinity Map

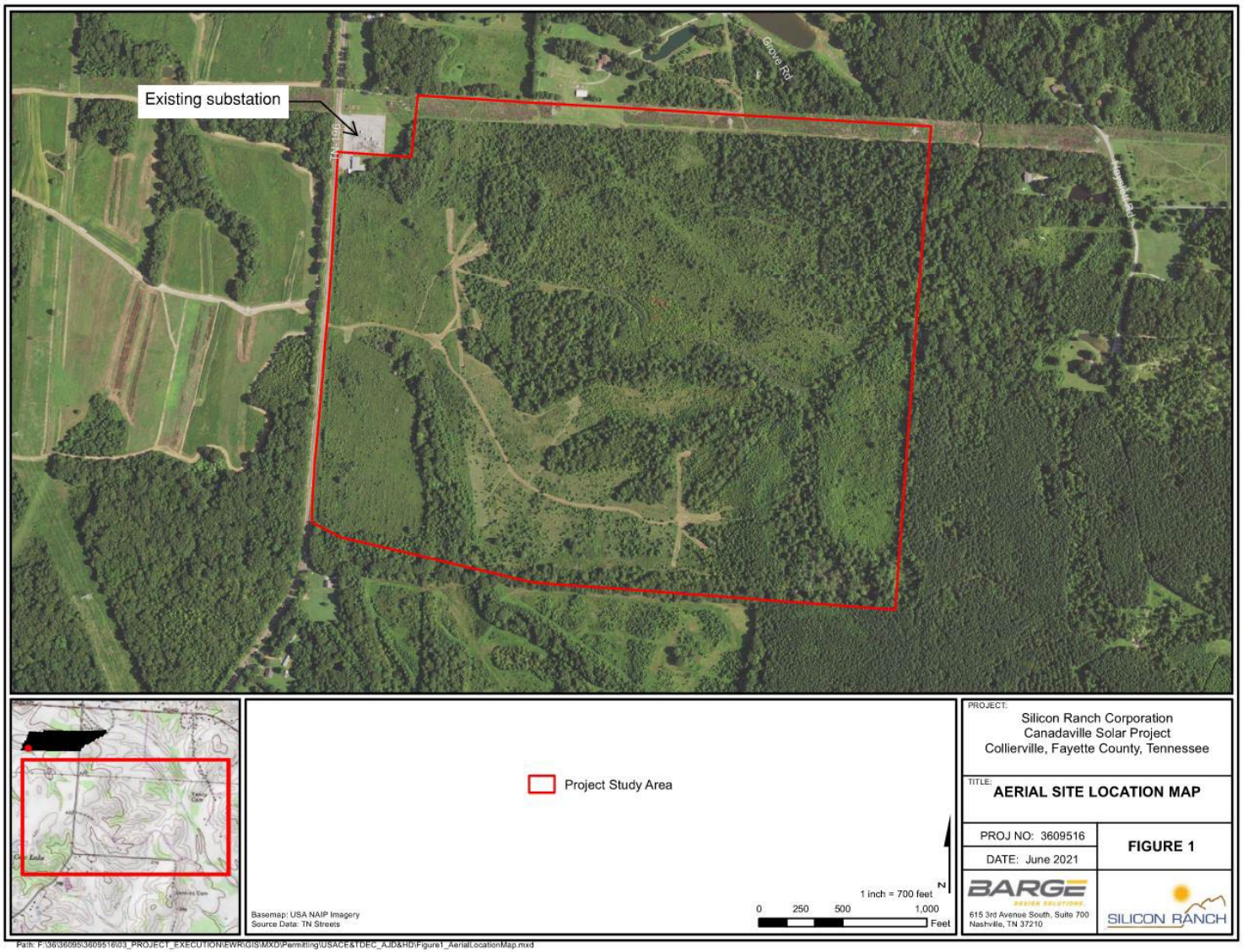

Figure 2. Canadaville – Project Location

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, Tennessee. Their 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) (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.

In June 2019, TVA released the final 2019 IRP and the associated Environmental Impact Statement (EIS) (TVA 2019). The 2019 IRP provides further direction on how TVA will deliver clean, reliable, and affordable energy in the Tennessee Valley over the next 20 years. 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 (TVA, 2020). The PPAs that resulted from this RFP (including the SR Canadaville 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 IRP and TVA goals.

The purpose of this project is to construct a solar PV facility in Fayette County, Tennessee. The project is needed to meet TVA's increasing customer demand while helping to meet TVA's goal as stated in the 2019 IRP.

1.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

The National Environmental Policy Act of 1969 (NEPA) (42 United States Code [U.S.C.] §§ 4321-4347) requires Federal agencies to evaluate the potential environmental impacts of their proposed actions. 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.

Because TVA began this EA after CEQ issued revised NEPA regulations (85 FR 43304-43376, Jul. 16, 2020), TVA used the revised CEQ regulations effective July 16, 2020 and TVA's 2020 NEPA regulations in the preparation of the (see 40 CFR 1506.13). TVA's Proposed Action, including connection to the existing substation northwest of the project site, would result in the

construction and operation of the proposed solar facility by SR Canadaville. This EA evaluates the potential impacts of TVA's Proposed Action and TVA's purchase of renewable energy from the facility under a 20-year PPA with SR Canadaville.

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 will be "environmentally acceptable." To be deemed "environmentally acceptable," TVA must determine 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 location, operation, and/or maintenance of the proposed project 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 (EOs), and policies, the following resource areas have been included for discussion and analysis within this EA: land use; geology, soils, 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; socioeconomics and environmental justice. Because there are no existing utilities in the project site, utilities were not discussed in further detail.

1.3 PUBLIC AND AGENCY INVOLVEMENT

An electronic version of the draft EA was posted on the TVA website for a 30-day public comment period, which includes an option for the public to submit comments electronically. TVA also 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. Public notices were also published in local newspapers soliciting comments from other agencies, the general public, and any interested organizations. In addition, SR Canadaville II will speak with members of the community and adjacent property owners about the proposed solar facility and answer questions as part of the county permitting process.

During the 30-day public review and comment period of the draft EA, a total of four responses from the general public and TDEC were received. The comments and responses are included as Appendix A. Comments that required revisions are referenced in this Final EA.

1.4 REQUIRED PERMITS AND LICENSES

Based on the scope of the proposed construction activities, as described in Chapter 2, the project would require an individual Construction Stormwater Permit (CGP) including a Stormwater Pollution Prevention Plan (SWPPP) from the Tennessee Department of Environment and Conservation (TDEC) (TDEC, 2018). The SWPPP would include the implementation of approved pollution prevention measures. As currently proposed, no temporary or permanent fill would be placed in jurisdictional aquatic features. Tree clearing is proposed within wetlands and would require authorization from TDEC (Section 401 of the Clean Water Act (CWA) Aquatic Alterations Resource Permit (ARAP). SR Canadaville would comply with permit conditions and compensatory mitigation measures as required. If determined required, SR Canadaville would obtain U.S. Army

Corps of Engineers (USACE) authorization (Section 404 of the CWA, Nationwide Permit [NWP] Pre-Construction Notification [PCN]).

Appropriate building and electrical permits would be obtained from the Fayette 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. As proposed, permanent access to the facility would be from the west, along SR 193/Chulahoma Road. If a stream and/or wetland impact is needed to accommodate access and/or construction of the panels, SR Canadaville will obtain the appropriate TDEC permit (Section 401 of the Clean Water Act [CWA] Aquatic Alteration Resource Permit [ARAP]) and the U.S. Army Corps of Engineers (USACE) (Section 404 of the CWA, Nationwide Permit [NWP] Pre-Construction Notification [PCN]).

CHAPTER 2

2.0 DESCRIPTION OF THE ALTERNATIVES

As part of the environmental review, the EA analyzes and compares potential impacts of each considered alternative. This chapter focuses on the background and understanding of the evaluated alternatives by describing each alternative, comparing these alternatives to their potential environmental impacts, and identifying 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 for 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 Canadaville. The solar facility would not be constructed and operated by SR Canadaville. 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. TVA would continue to rely on other sources of generation as described in the 2019 IRP (TVA 2019) to ensure an adequate energy supply and to meet its goal for increased renewable energy and low GHG-emitting generation.

2.2 PROPOSED ACTION ALTERNATIVE

The Proposed Action Alternative would provide for the installation and operation of a 16 MW AC solar facility, as well as its connection to the TVA power system, in Fayette County, Tennessee, and TVA's purchase of renewable energy from the facility under a 20-year PPA with SR Canadaville. The proposed project would be developed on a 223-acre tract west of SR 193/Chulahoma Road and SR 196/Macon Road in unincorporated Fayette County, Tennessee.

2.2.1 Solar Facility

The solar arrays would likely be supported by steel piles which would either be driven or screwed into the ground to a depth of 6 to 9 feet. Internal access roads are proposed to provide access for maintenance and inspections. 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. The trenches would be approximately 2 to 3 feet deep and 1 to 2 feet wide. Figure 5 (below) provides the overall site layout for the Proposed Action Alternative.

A new Canadaville 13- kV solar generation substation would be constructed by SR Canadaville on the project site. CEC would install two new bays with breakers and switches within the existing Canadaville Substation. CEC would also install a new control building to house control equipment. The existing substation is adjacent to the northwest corner of the subject property connecting at structure 379 on the existing Cordova-Diffee 161 kV TL adjacent to the north side of the subject property. Additionally, TVA would install new telecommunications and protective relaying equipment within the CEC-owned house to be built at the existing Canadaville Substation. CEC would install seven miles of FCL to existing TL poles along the existing ROW for communications purposes.

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 3).

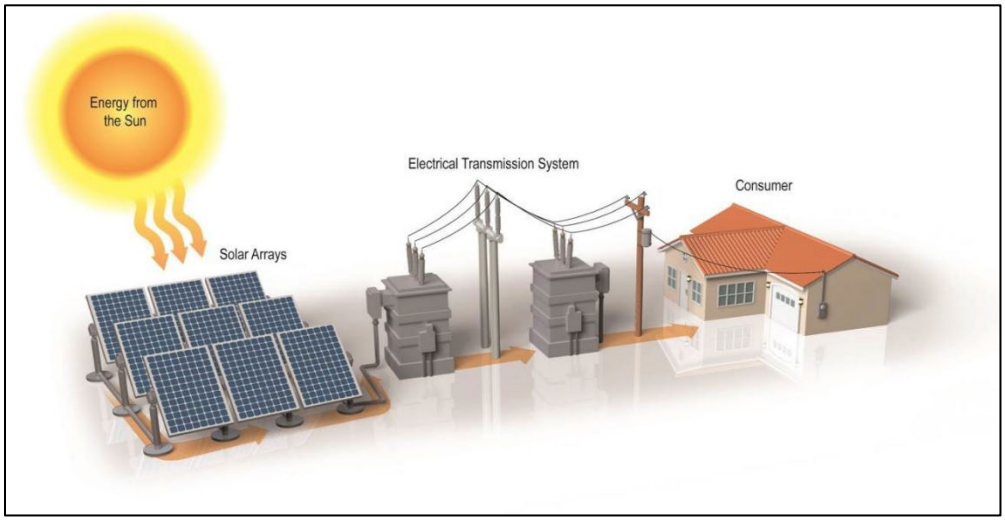

Figure 3. General energy flow diagram of PV solar system (not to scale)

Each panel at the Canadaville solar facility would be capable of producing approximately 460 watts and would be mounted together in arrays. The arrays would connect to a total of 82 0.25-MW power inverters to convert the DC electricity generated by the solar panels into AC electricity and seven 3.00 MVA transformers for the project's electrical collection system connecting to the existing Canadaville, Tennessee, 161-kV substation.

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 either a vibratory pile driver or helical piles with a depth of 6 to 10 feet below grade (Figure 4).

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 three to four feet deep and one to four feet wide. Each trench would be backfilled with project-site native soil and then appropriately compacted. Aboveground cables would connect the modules to harnesses that lead wiring to combiner boxes.

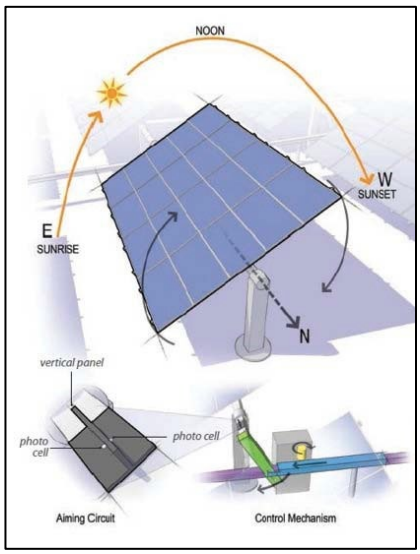

Figure 4. Diagram of single-axis tracking system (not to scale)

The AC power from each inverter would be connected to the transformer. The underground voltage collection circuits would deliver AC electricity to the new onsite Canadaville solar substation interconnected with a single-span tie-in to the existing TVA 161-kV overhead TL.

The PV panels would be installed in parallel north-south rows. The arrays would contain approximately 82 inverters and approximately 163 10-string and 499 13-string trackers. Buried electrical cables would connect the rows of PV panels to 0.25-MW power inverters, each connecting to a pad-mounted 3.00 MVA-transformer on site. The buried cables would be linked in series from each transformer to the new onsite Canadaville solar substation interconnected with a single-span tie-in to the existing TVA 161-kV overhead TL. 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. Of the energy produced from the 20.5-MW AC site, 16 MW would be fed through the interconnection and sold to TVA. The loss of 4.5 MW is due to expected line loss before reaching the Point of Interconnection.

2.2.2 Electrical Interconnection

A new Canadaville 13- kV solar generation substation would be constructed by SR Canadaville on the project site. CEC would install two new bays with breakers and switches within the existing Canadaville Substation. CEC would also install a new control building to house control equipment. The existing substation is adjacent to the northwest corner of the subject property connecting at structure 379 on the existing Cordova-Diffee 161 kV TL adjacent to the north side of the subject property. Additionally, TVA would install new telecommunications and protective relaying equipment within the CEC-owned house to be built at the existing Canadaville Substation. CEC would install seven miles of FCL to existing TL poles along the existing ROW for communications purposes using existing roadways or ROW without disturbing the ground.

Except for approximately 1,975 feet at the terminal end of the line, the new fiber line will be installed to existing poles within the TL ROW. The last approximately 1,975 feet of fiber line in a built up area will be trenched and buried.

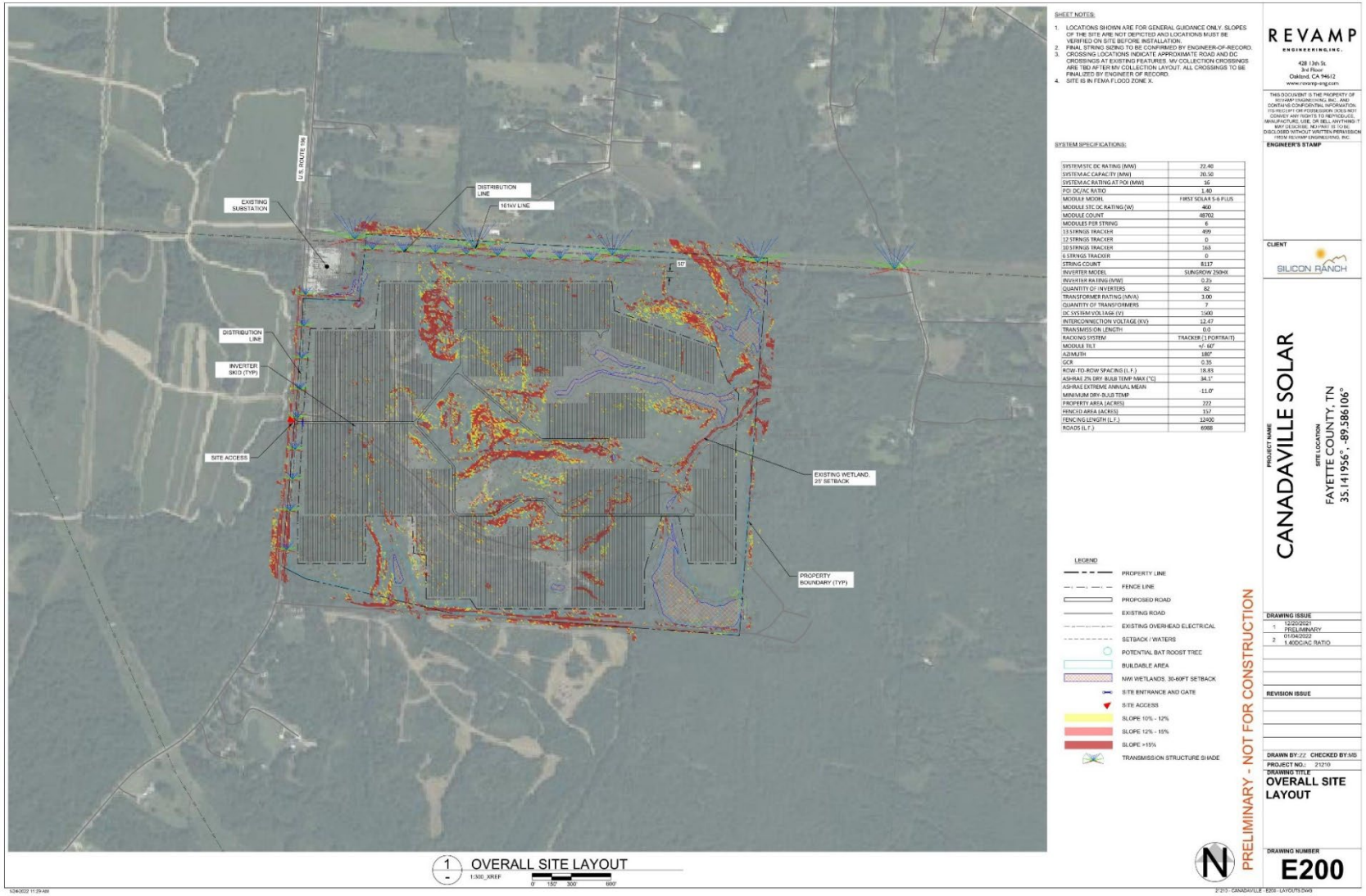

Figure 5. Canadaville – Conceptual Layout

2.2.3 Construction

Site preparation of the solar power facility generally requires 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. Solar array assembly and construction include driving steel piles for the tracker support structures, installing solar panels and electrical connections, and system testing and verification.

SR Canadaville is currently exploring the location of the construction and permanent access roads, keeping safety as the priority. These potential areas have been included in the environmental review. As proposed, permanent access to the facility would be from SR 196/Chulahoma Road to the west. Tree clearing is required to reduce shade on the proposed panels and would result in wetland impacts. SR Canadaville would obtain the appropriate permits from TDEC and USACE under Sections 401 and 404 of the CWA (33 U.S.C. § 1251 et seq.).

The 2017 TVA BMPs (TVA, 2017) would be implemented and maintained during construction and operation of the facility. SRC's standard practice, which SR Canadaville 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 local land. Before grading, native topsoil would be removed from the area to be graded and stockpiled onsite for redistribution over the disturbed area once grading has been completed. Silt fences, sedimentation basins, and other appropriate controls would be used as needed to minimize erosion and sedimentation. Disturbed areas would be seeded post-construction using a combination of pollinator-friendly seed mix and certified weed-free, low-growing native grass seed obtained from a reputable seed dealer and in compliance with the requirements established by the Natural Resources Conservation Service (NRCS). Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to pre-construction 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 the earth to meet the final design requirements. Limited disturbance is expected at the project location as the site is relatively flat. Woody material cleared may be chipped and spread onsite 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, 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 for streams that are not impaired and 60-foot buffer for streams that are impaired surrounding all avoided streams and wetlands would be established as an avoidance measure prior to any clearing, grubbing, or grading activities conducted by the contractor (TDEC, 2012). Once sensitive areas are marked, construction areas would be cleared of vegetation and miscellaneous debris. Mowing would continue as needed to contain growth during construction.

The streams and identified surface waters within the project site draining to the east towards Alexander Creek require a 30-foot buffer. The streams and identified surface waters within the project site draining to the northwest towards Grays Creek would require a 60-foot buffer. Under

the Proposed Action Alternative, SR Canadaville would clear approximately 102 acres of trees within the 223-acre project footprint to accommodate the proposed solar facility and reduce shading on the panels. Non-mechanical tree clearing would be proposed within the stream and wetland buffer areas and within the nearby wetland to accommodate the Proposed Action Alternative. Stumps would be left in place to reduce ground disturbance within the buffer and wetland areas. SR Canadaville would obtain the appropriate permits from TDEC and USACE for tree clearing in wetlands and mitigate to a minimal effect. The SWPPP would reflect the proposed tree clearing, including justification for impact and proposed erosion and sediment control measures to maintain water quality. No chipping or spreading of debris would occur within the wetland areas. Wetland conversion impacts are proposed. Apart from removing tall vegetation through non-mechanical means and leaving the roots in place, no fill would be placed in wetlands.

Sediment traps and erosion control silt fences would be utilized to manage stormwater erosion across the entire site and throughout the construction phase. Nearby wetlands, streams, and their respective 30-foot and 60-foot buffers would be protected by erosion control silt fences. Sediment traps would be placed in strategic drainage areas. These stormwater BMPs would prevent sediment from impacting local water resources or migrating off-site.

A construction assembly area (laydown area) would be required for worker assembly, vehicle parking, and material storage during construction. This area would be on the site for the duration of the construction period. A temporary construction trailer, used for material storage and office space, would be parked on site. All construction equipment employed on site would be maintained per local, state, and federal regulations. Electric powered equipment such as utility vehicles and electric portable earthmoving equipment may be used on-site during construction operations and maintenance.

Following completion of construction activities, all buildings, trailers, unused materials, and construction debris would be removed from the site and soil erosion control measures will be maintained until raw areas have been stabilized. 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, the soil would be stabilized by mulch or seed. Where required, hay mulch would be applied at 3 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 pre-construction 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. The pile is driven with a hydraulic ram. 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. Screw piles are another option for PV foundations driven into the ground with a truck-mounted auger. Screw piles create a similar soil disturbance footprint as driven piles.

Solar panels would be manufactured off-site 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 a 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.

A new Canadaville 13- kV solar generation substation would be constructed by SR Canadaville on the project site. CEC would install two new bays with breakers and switches within the existing Canadaville Substation. CEC would also install a new control building to house control equipment. The existing substation is adjacent to the northwest corner of the subject property connecting at structure 379 on the existing Cordova-Diffee 161 kV TL adjacent to the north side of the subject property. Additionally, TVA would install new telecommunications and protective relaying equipment within the CEC-owned house to be built at the existing Canadaville Substation. CEC would install seven miles of FCL to existing TL poles along the existing ROW for communications purposes.

The FCL update will be placed on existing TL poles located within the ROW of the existing TL line. Approximately 1,983 feet of FCL is proposed to be trenched adjacent to Amherst Drive and leads to the terminal end of the fiber line at the existing Cordova-Diffee TL, Structure 493 TL. The FCL to be installed on the existing TL poles runs north, adjacent to SR 196/Chulahoma Road from the existing substation for 5.2 miles where SR196 and Chulahoma Road separate. The TL follows Chulahoma Road for 0.5 miles, then turns west, follows US 64 for 0.2 miles, and then turns north to SR 196/Chulahoma Road. The TL runs adjacent to SR196/Chulahoma Road for 2.9 miles and then turns east following Fields Drive for 0.75 miles. At this point, the TL heads north but will be trenched adjacent to Amherst Drive for approximately 0.3 miles until reaching the Cordova-Diffee TL where it will splice into the network.

Within the 223-acre site, the 157-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 phase and operational period of the project. The proposed TL upgrades and interconnection would not be fenced. Construction activities would take approximately eight months to complete using a crew of approximately 100 to 150 people at the peak of construction. Work would generally occur six days per week (Monday through Saturday) from 7 am to 6 pm.

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. Traditional trimming and mowing would be performed periodically (about four mowing events per year) to maintain the vegetation at a height ranging from 6 inches to 2 feet. Selective use of herbicides may also be employed around structures to control weeds. Products would be used per local, state, and federal regulations. 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 weekly. Maintenance would be required biannually. In case of equipment failures, staff would respond as soon as possible. Biannual inspections would involve drawing transformer oil samples and identifying physical damage to panels, wiring, and interconnection equipment.

Vegetation on the site would be maintained to control growth and prevent shading of the PV panels or interference with the tracking mechanisms. Depending on the growth rate, traditional trimming and mowing would be performed four to five times a year to maintain low vegetation height. Electric-powered equipment such as utility vehicles may be used on the site during operations and maintenance. Selective use of spot herbicides may also be employed around structures to control any invasive weed outbreak. 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. Precipitation in this region is adequate to remove dust and other debris from the PV panels while maintaining energy production; therefore, manual panel washing is not anticipated unless a specific issue is identified. 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 Canadaville would reassess the site operation and determine whether to cease operation or attempt to enter into a new PPA or another arrangement. If TVA or another entity is willing to enter into such an agreement, the facility would continue operating. If no commercial arrangement is possible, the facility would be decommissioned and dismantled, and the site restored. In general, the majority of decommissioned equipment and materials would be recycled. Materials that cannot be recycled would be disposed of at approved facilities in accordance with applicable federal, state, and local laws and regulations. SR Canadaville would develop a decommissioning plan to document recycling and disposal of materials following 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 Fayette 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	Minor direct and indirect adverse impacts are anticipated. Wooded land used for hunting would be altered by construction and vegetated during operation.
Geology, Soils, and Prime Farmland	No impacts anticipated	Geology and Soils: Minor direct impacts to geology and soils, resulting from minor to minimal increases in erosion and sedimentation anticipated during construction and operation. While in operation, minor adverse impacts to soils would be offset by beneficial effects of vegetative management. Farmland: Minor impacts to prime farmland are anticipated; no permanent or irreversible conversion of farmland would occur.
Water Resources	No impacts anticipated	Groundwater: No direct adverse impacts are anticipated. Surface Water: Minor direct impacts to streams anticipated to accommodate the proposed access roads and solar panels. Minor indirect impacts to water resources could occur from stormwater runoff during construction. Direct impacts to forested wetlands are anticipated from non-mechanical tree removal. No grading or ground disturbance is proposed within wetland areas. SR Canadaville will obtain appropriate permits from USACE and TDEC and mitigate to minimize wetland conversion impact. Floodplains: No direct or indirect impacts are anticipated from the development of the solar facility. No impacts on floodplains and their natural and beneficial values are anticipated.
Biological Resources	No impacts anticipated	Vegetation: Direct impact to vegetation by clearing up to approximately 102 acres of trees and other tall vegetation within the project area proposed for development. Wildlife: Displacement of wildlife including migratory birds during clearing and construction. Long-term impacts to migratory bird populations are not 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	Due to increased traffic, temporary, minor direct impacts on visual resources are anticipated during the construction phase. The views from surrounding properties may be slightly affected.
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 on air quality would occur if trees are removed during clearing are burned and during construction activities from equipment operation. No negative impacts on air quality are anticipated due to 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 nearly emissions-free power generated by the solar facility, offsetting power that would otherwise need to be generated by the combustion of fossil fuels.
Cultural Resources	No impacts anticipated	No direct or indirect impacts are anticipated from the development of the solar facility.

Resource Area	Impacts from No Action Alternative	Impacts from Proposed Action Alternative
Solid and Hazardous Wastes	No impacts anticipated	Minor adverse impacts anticipated from the 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 per applicable local, state and federal laws and regulations. Impacts during system operation would be negligible by implementing recycling practices.
Public and Occupational Health and Safety	No impacts anticipated	Minor temporary adverse impacts during construction. No adverse effects are anticipated with the use of BMPs. No public health or safety hazards are expected as a result of the operation.
Transportation	No impacts anticipated	Minor temporary adverse impact during construction. No direct impacts to 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 creating 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 Canadaville would implement the following minimization and mitigation measures in relation to resources potentially affected by the proposed project:

- Maintain existing landscape and aquatic resource buffers. If Fayette County requires additional buffers, SR Canadaville 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 buffers, placement of silt fences and sediment traps along buffer edges, and proper vehicle maintenance and compliance with Spill Prevention, Control, and Countermeasures (SPCC) to reduce the potential for adverse impacts to groundwater.
- Design of the final layout would minimize direct and indirect impacts on aquatic features. Comply with the conditions of the TDEC Section 401 and USACE 404 of the CWA (33 U.S.C. § 1251 et seq.) permits and required compensatory mitigation, as applicable.
- Should traffic flow be a problem for local developments, SRC would consider staggering work shifts to space out traffic flow to and from the project site. Such a mitigation measure would minimize potential adverse impacts to traffic and transportation to less than significant levels.
- Any manual tree cutting in wetlands will leave the stumps in place to preserve hydric soils.

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

Chapter 3 discusses the proposed project site's existing environmental, social, and economic conditions and surrounding areas that would be impacted by the proposed activities. In addition to the existing conditions, potential environmental effects associated with each considered alternative are identified and discussed throughout this chapter.

3.1 LAND USE

Land use of the project site and surrounding properties has been included in the evaluation of potential impacts. This section discusses 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 vegetated with grasses, shrub/scrub, and trees and is primarily used for hunting. SR 196/Chulahoma Road is adjacent to the west. The Cordova-Diffee 161 kV TL and Canadaville, Tennessee, 161-kV substation are adjacent to the northwest quadrant of the subject property. The subject parcel is zoned R1 Residential and owned by SRC.

Properties within a three-mile radius of the project site are a mix of forested and agricultural land with several clusters of moderate density housing and scattered rural homesites. The only recreation or natural area identified within the three-mile radius is the Herb Parsons Fishing Lake, located approximately 1.2 miles west of the project site. Future land use plans show this parcel and area to be outside of planned growth areas.

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 vacant and used primarily for hunting.

3.1.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the proposed solar facility would result in converting the site from undeveloped, forested land to industrial use. Given the existing ROW with several high voltage TLs, the existing substation, and county services adjacent to the project site, the Proposed Action Alternative would introduce a similar land use with a larger industrial footprint than the existing uses along SR 196/Chulahoma Road. Based on the Fayette County development plan, the project site is identified as unincorporated county land. Detrimental impacts associated with the change in land use resulting from the Proposed Action Alternative would be minor.

Fayette County regulations require a special use permit to build solar farms. SR Canadaville would anticipate beginning the county permitting process in the first quarter of 2022.

Since the TVA substation modifications (includes construction of a new switch house) would occur within the footprint of the existing substation, no land-use-related impacts would occur from the proposed modifications.

Approximately seven miles of FCL upgrade would be attached to existing TVA 161-kV TL poles in the existing ROW. The fiber line upgrade would be installed on the existing TLs within the ROW, so no change in land use or impact is anticipated. The approximate 1,983 feet of FCL to be buried runs along Amherst Drive, a residential neighborhood road, and within the TVA ROW. No land use change is anticipated as a result of the FCL updates.

3.2 GEOLOGY, SOILS, AND PRIME FARMLAND

Impacts to the geology, soils, and prime farmland have been included in evaluating potential impacts. This section discusses the existing geology, soils, and prime farmland within the project site and potential impacts to geology, soils, and prime farmland that would be 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 located in West Tennessee, which is divided into the Gulf Coastal Plain and the Mississippi Alluvial Plain physiographic provinces. The project is in Fayette County and is within the Gulf Coastal Plain. The site is mapped as being 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 arbitrarily quantifies the effects of an earthquake based on the observed effects on people, the natural environment and development. 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 how 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 7) 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 0.16g for a PGA with a 10 percent probability of exceedance within 50 years (USGS, n.d.).

3.2.1.2 Soils

Sixteen soil units consisting of thirteen silt loams and three sloped eroded complexes were identified on site (USDA. n.d.-a). The dominant soil unit, Falaya silt loam, local alluvium (Fu), accounts for 14.9 percent of the project study area and is considered as non-hydric for Fayette County. The Henry silt loam (He) and Waverly silt loam, 0 to 2 percent slopes, frequently flooded, long duration (Wv) are considered hydric for Fayette County, Tennessee. The Henry silt loam soil accounts for 8.2 acres or 3.7 percent of the project study area. Waverly silt loam soil accounts for

7.1 acres or 3.2 percent of the project study area. Figure 7 below shows the approximate distribution area of each soil type, and Table 2 provides a list of soils identified within the area of interest (AOI), defined as the 223-acre project site.

Five types of silt loam soils were identified in the 19.1-acre AOI where the TL would be trenched (USDA, n.d. -b). None of them are considered hydric soils for Fayette County. The dominant soil unit, Grenada silt loam, 5 to 8 percent slopes, severely eroded, accounts for 50.8 percent (9.7 acres) of the trenched study area. Falaya silt loam (24.5 percent, 4.7 acres), Grenada silt loam, 2 to 5 percent slopes, eroded (22.9 percent, 4.4 acres), and Grenada silt loam, 2 to 5 percent slopes, severely eroded (1,7 acres, 0.3 acres) comprise the other soil units int the AOI. Figure 6 below shows the approximate distribution area of each soil type, and Table 3 provides a list of soils identified within the 19.1-acre AOI.

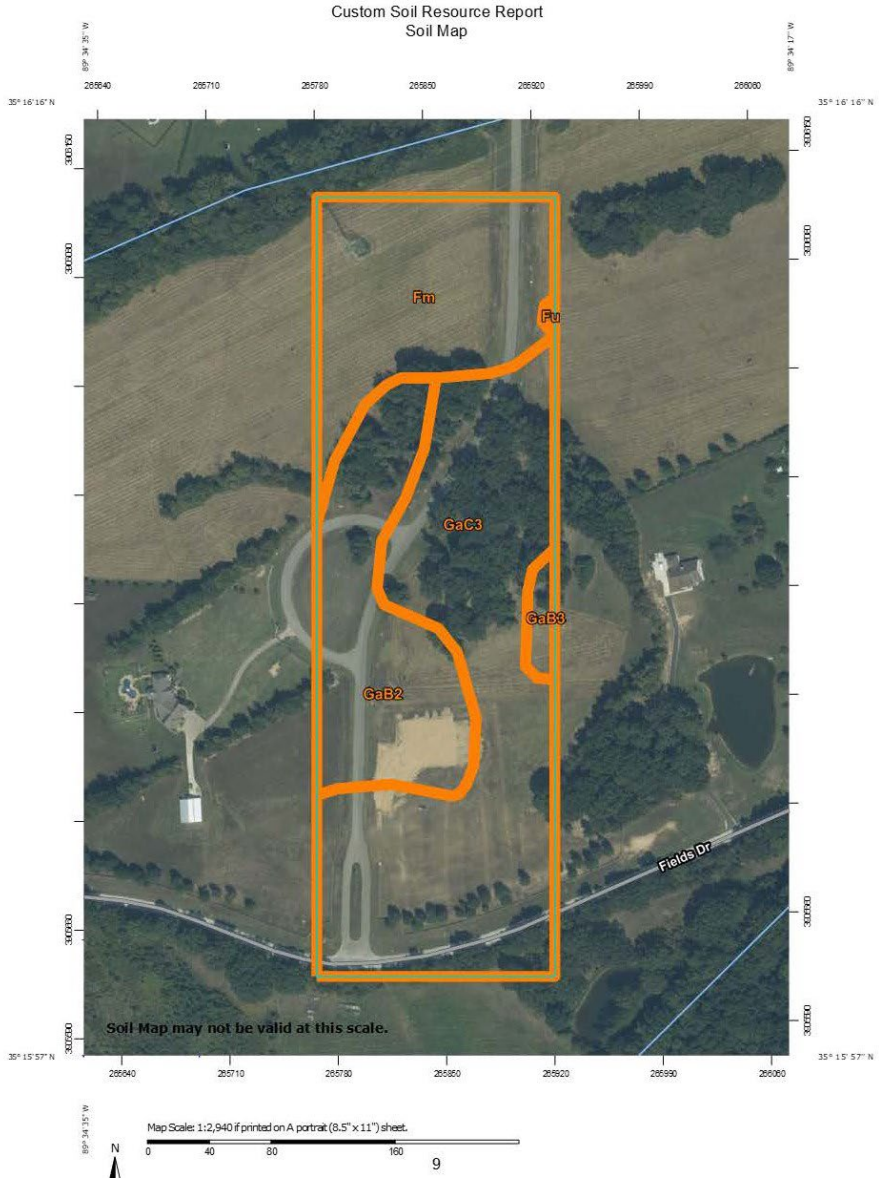

Figure 6. Trenched Area Soil Map

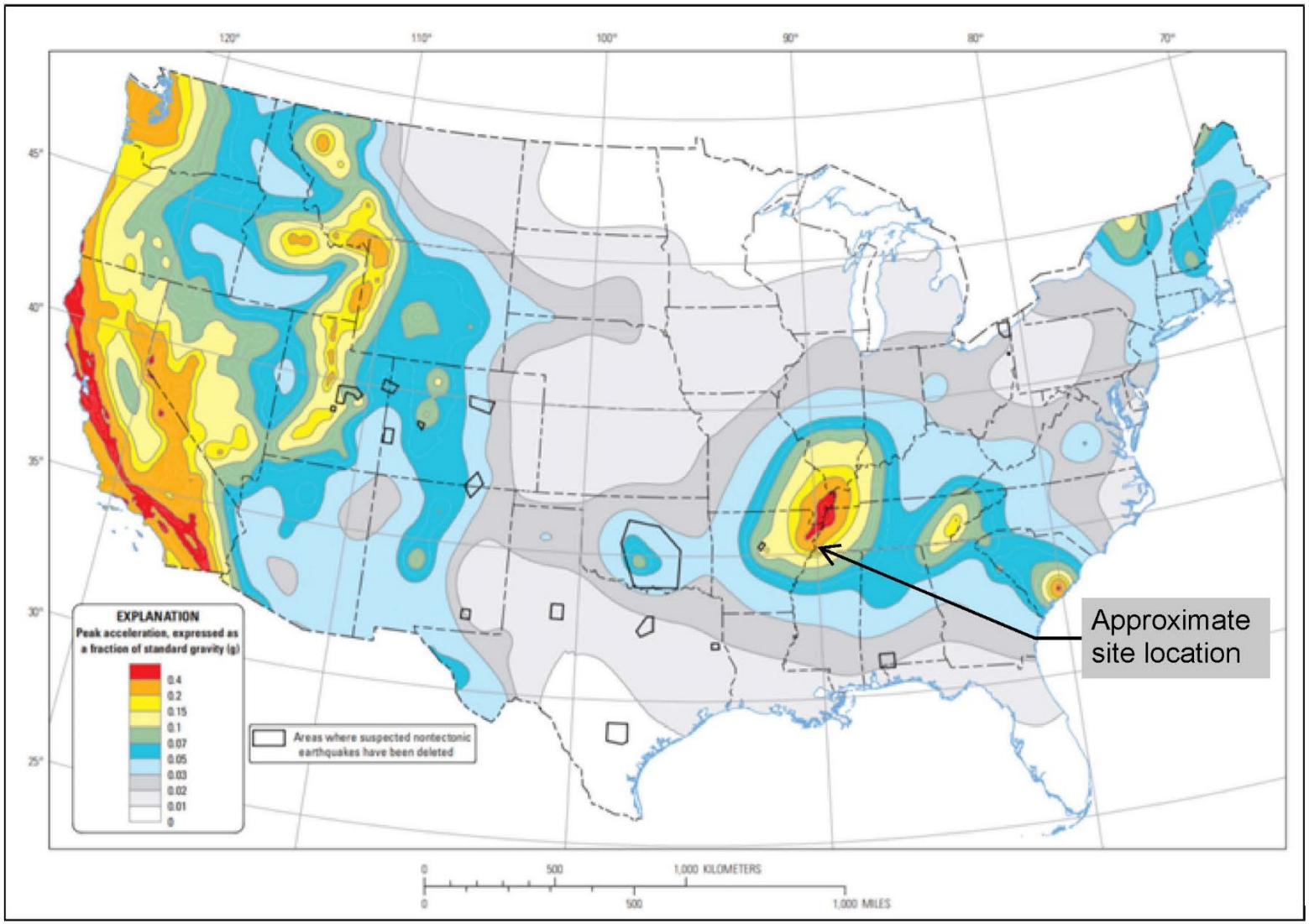

Figure 7. Ten-percent Probability of Exceedance in 50 Years Map of Peak Ground Acceleration

Figure 8. Site Soil Map

Table 2. Site Soils

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CaA	Calloway silt loam, 0 to 2 percent slopes	4.8	2.2%
CaB2	Calloway silt loam, 2 to 5 percent slopes, eroded	21.0	9.4%
Co	Collins silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration	4.9	2.2%
Fu	Falaya silt loam, local alluvium	33.2	14.9%
GaA	Grenada silt loam, 0 to 2 percent slopes	1.5	0.7%
GaB	Grenada silt loam, 2 to 5 percent slopes	3.9	1.8%
GaB2	Grenada silt loam, 2 to 5 percent slopes, eroded	25.9	11.6%
GaB3	Grenada silt loam, 2 to 5 percent slopes, severely eroded	8.9	4.0%
GaC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded	25.0	11.2%
GaD	Grenada silt loam, 8 to 12 percent slopes	2.8	1.2%
GgC	Grenada-Gullied land complex, 5 to 8 percent slopes	18.0	8.1%
GgD	Grenada-Gullied land complex, 8 to 12 percent slopes	22.4	10.0%
Gs	Gullied land, silty	12.6	5.7%
He	Henry silt loam	8.2	3.7%
MeB	Memphis silt loam, 2 to 5 percent slopes, northern phase	22.8	10.2%
Wv	Waverly silt loam, 0 to 2 percent slopes, frequently flooded, long duration	7.1	3.2%
Totals for Area of Interest		**223.1**	**100.0%**

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

Table 3. Trenched Area Soils

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Fm	Falaya silt loam	4.7	24.5%
Fu	Falaya silt loam, local alluvium	0.0	0.2%
GaB2	Grenada silt loam, 2 to 5 percent slopes, eroded	4.4	22.9%
GaB3	Grenada silt loam, 2 to 5 percent slopes, severely eroded	0.3	1.7%
GaC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded	9.7	50.8%
Totals for Area of Interest		**19.1**	**100.0%**

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

Below is a brief description of some of the more prominent soils on the project and trenched area sites.

Calloway silt loam, 0 to 2 percent slopes, eroded (Ca2), is a deep, somewhat poorly drained soil. The depth to the water table is about 7 to 21 inches. Falaya silt loam (Fm) is a very deep, somewhat poorly drained soil. The depth to the water table is about 12 to 24 inches.

The Grenada silt loam, 2 to 5 percent slopes, eroded (GaB2), is a very deep, moderately well-drained soil. This soil has about 7-to 18-inch depth to the water table. Grenada silt loam, 5 to 8 percent slopes, severely eroded (GaC3), is a moderately well-drained soil. The depth to the water table is about 8 to 17 inches. Memphis silt loam, 2 to 5 percent slopes, northern phase is a very deep, well-drained soil. The depth to the water table is more than 80 inches.

Of the 16 soils units identified on the project site, only Waverly is considered hydric for Fayette County, Tennessee. It accounts for 3.2 percent of the project site.

The area to be trenched has five soil types. Falaya silt loam (Fm) and Grenada silt loam, 2 to 5 percent slopes, eroded (GaB2) and Grenada silt loam, 5 to 8 percent slopes, severely eroded (GaC3) comprise 98.2 percent of the AOI. Neither are considered hydric for Fayette County, Tennessee.

3.2.1.5 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. Prime farmland uses include cropland, pastureland, rangeland, forest land, or other land, but is not urban built-up land or water areas. 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. -c).

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 sixteen soils identified within the project site, Calloway silt loam, 2 to 5 percent slopes, eroded, Collins silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration, Falaya silt loam, local alluvium, Grenada silt loam, 0 to 2 percent slopes, Grenada silt loam, 2 to 5 percent slopes, Grenada silt loam, 2 to 5 percent slopes, eroded, and Memphis silt loam, 2 to 5 percent slopes, northern phase are indicated as prime farmland, making up approximately 102 acres (about 45 percent) of the project site (Table 2). The trenched area consists of residential land and TL land.

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 forested areas for hunting.

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 Paleontology

Under the Proposed Action Alternative, minor impacts to geology could occur. The solar arrays would be supported by steel piles that would be mechanically driven into the ground to a depth of six to nine feet. Trenching depths of approximately two to three feet would also be required for underground wiring connections between solar panels. On-site sedimentation basins would be shallow and, to the extent feasible, utilize the existing terrain without requiring extensive excavation. The PV panels would be connected with underground wiring placed in 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 would be anticipated.

As excavation would be limited, only 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 these resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy.

The TVA substation modifications would occur within the footprint of the existing substation. No new impacts related to geology and paleontology are anticipated. A portion of the 7-mile FCL will be trenched. Approximately 1,983 feet of the FCL will be trenched and backfilled with project-site native soil. Due to the small subsurface disturbances proposed for the FCL updates, minor impacts to potential subsurface geological resources would be anticipated.

Geologic Hazards

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 minor 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 on-site structures would pose minimal human risk. Geologic hazard impacts on the site would be unlikely to impact off-site resources.

The proposed interconnection and seven miles of FCL would be designed to comply with applicable standards. Potential impacts from seismic activity would be minimal and would be unlikely to cause adverse impacts to the proposed fiber and existing TL structures. Further, since the TVA substation modifications would occur within the footprint of the existing substation, no new impacts from seismic activity to the substation are anticipated.

Soils

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

It is unlikely that off-site soil resources would be necessary for construction. However, if borrow materials, such as sand and gravel, or other aggregate are necessary during site preparation, resources may be obtained from nearby previously permitted off-site sources.

Minor disturbance to soils would occur during operation of the Proposed Action Alternative. Creating a new impervious surface, 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 an SWPPP describing the management practices that would be utilized during construction to prevent erosion and runoff and reduce pollutants in stormwater discharges from the project site. Following construction, the 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. The Proposed Action Alternative would implement an integrated vegetation management plan including biological (i.e., managed sheep grazing), mechanical, and chemical controls as needed. Mechanized landscaping may include the use of lawnmowers, weed eaters, etc. Traditional trimming and mowing would be performed periodically to maintain the vegetation at a height ranging from six inches to two feet. Electric-powered equipment such as utility vehicles may be used on the site during operations and maintenance. Selective use of herbicides may also be employed around structures to control weeds. Products would be applied per local, state, and federal regulations. Weather events, e.g., predicted rainfall or high winds, would be taken into account prior to the application of herbicides in efforts to reduce potential runoff or drift. These maintenance activities would not result in adverse impacts to soils on the project site during operations.

Since the TVA substation modifications would occur within the footprint of the existing substation and FCL would be on existing TL poles in the ROW. It is unlikely that soil-related impacts would

arise from the proposed modifications associated with FCL installation. Minor impacts are anticipated from the approximate 1,675 feet of trenching that will be done along Amherst Drive and 308 feet within the TVA ROW. For this work, proper TDEC erosion and sediment controls would be followed during construction.

Prime Farmland

The construction and operation of the Proposed Action Alternative would result in a temporary adverse impact to prime farmland. Approximately 45 percent or 102 acres of the project site soil is considered prime farmland. The entirety of the solar array, which would cover approximately 157 acres, 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.

Solar projects do not result in the permanent or irreversible conversion of farmland. The Proposed Action Alternative would have minimal direct and indirect effects on prime farmland based on the limited site disturbance. While agricultural production would not be possible where panels are placed on the project site, the Proposed Action Alternative would implement an integrated vegetation management plan including biological (i.e., managed sheep grazing). This will allow for some use of the prime farmland on the project site during the operational phase of the project. Once the solar farm is dismantled, the site could be readily used for agricultural production. Thus, the long-term impacts to prime farmlands and soil productivity would be insignificant.

Trenching and placement of the FCL would occur on prime farmland soil units. The current use of this land is residential and a TVA ROW. These are not considered to be prime farmland by USGS. Further, the TVA substation modifications would occur within the footprint of the existing substation. The substation is also not considered to be prime farmland by USGS.

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 that would be associated with the No Action Alternative and Proposed Action Alternative. Water resources discussed in this section include groundwater, surface water, wetlands, and floodplains.

3.3.1 Affected Environment

3.3.1.1 Groundwater

The Upper Claiborne aquifer, part of the Mississippi embayment aquifer system in the Coastal Plain physiographic province, underlies the majority of the project site in Fayette County. The Middle Claiborne confining unit, situated between the Upper and Middle Claiborne aquifers, underlies limited, eastern portions of the project study area and is a major groundwater source in the region. The Mississippi embayment aquifer system underlies portions of Alabama, Arkansas, Florida, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee.

3.3.1.2 Surface Water and Wetlands

Surface waters are defined as open or flowing water features, typically consisting of streams, rivers, lakes, or ponds, and wetlands. Surface water features are further segregated as having

perennial, intermittent, and ephemeral flow. TDEC also designates certain surface water features as wet weather conveyances (WWCs). Perennial waters are permanent surface water features present throughout the year. Intermittent classification is generally restricted to streams with 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 ordinary high-water mark (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 Fayette County and drains to waterways within the (8-digit HUC 08010210) Wolf River watershed and, more specifically, to the Shaws Creek (12-digit HUC 080102100303) and Grays Creek (12-digit HUC 080102100304) watersheds. The Wolf River watershed encompasses approximately 819 square miles and empties into the Mississippi River Watershed. The Shaws Creek and Grays Creek subwatersheds are on the 303d List.

There are no named streams that run through the project site. Along the 7-mile corridor, there are existing overhead TL crossings of Cypress Creek Tributary B and Cypress Creek. No wetlands or streams will be impacted by placement of the FCL. Along the area to be trenched, no surface waters or wetlands were identified.

A desktop review of available data was completed prior to conducting a field survey. Aerial photographs, USGS topographic maps, National Wetlands Inventory (NWI) maps, and soil survey maps were consulted to identify the subject property's current and historic drainage patterns and connectivity of potential wetlands to any other jurisdictional wetlands or waters of the U.S. A field survey was conducted on April 21 and 22, 2021, 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). Surface water features on the project site were identified by a Tennessee Qualified Hydrologic Professional (TN-QHP).

Wetland condition was evaluated using the Tennessee Rapid Assessment Method (TRAM), which quantifies wetland function and classifies wetlands into three categories: low, moderate quality, or exceptional resource value (TDEC 2019). Low quality wetlands are degraded aquatic resources which may exhibit low species diversity, minimal hydrologic input and connectivity, recent or on-going disturbance regimes, and/or predominance of non-native species. These wetlands provide low functionality and are considered low value. Moderate quality wetlands provide functions at a greater value due to a lesser degree of degradation and/or due to their habitat, landscape position, or hydrologic input. Moderate quality wetlands are considered healthy water resources of value. Disturbance to hydrology, substrate ,and/or vegetation may be present to a degree at which valuable functional capacity is sustained. Wetlands with exceptional resource value provide high functions and values within a watershed or are of regional/statewide concern. Those wetlands would exhibit little, if any, recent disturbance, provide essential and/or large-scale stormwater storage, sediment retention, and toxin absorption, contain mature vegetation communities, and/or offer habitat to rare species.

Figures 9-1 to 9-4 identify aquatic resources located within the project site. Ten wetlands (WTL) were observed within the project study area. The wetlands were observed as either Palustrine Forested (PFO) or Palustrine Scrub/Shrub (PSS) wetland features. Each wetland was verified with the positive identification of suitable hydrology, hydrophytic vegetation, and hydric soils. The only man-made pond feature within the project study area is P-1. P-1 did not have an established wetland fringe and appeared to be more consistently used by cattle. The pond appeared to be isolated with no obvious sign of connection to nearby jurisdictional waters. Figure 9-5 identifies the floodplains along the route of the TL that will have FLC installed. Table 4 details the wetland features delineated within the project site.

Table 4. Wetland Features Delineated during Canadaville Field Survey

Palin Map	Cowardin Classification	Location Within Project Boundaries	Estimated Amount of Aquatic Resource in Project Site	TRAM SCORE	State Jurisdiction	Federal Jurisdiction
WTL-1	PSS	35.138777, -89.587093	0.07	23	Yes	No
WTL-2	PFO	35.138161, -89.583783	4.22	73	Yes	Yes
WTL-3	PSS	35.140642, -89.584305	0.46	32	Yes	Yes
WTL-4	PFO/PSS	35.143225, -89.584998	1.56	53	Yes	Yes
WTL-5	PFO	35.141523, -89.585808	0.01	32	Yes	Yes
WTL-6	PFO/PSS	35.143465, -89.585554	0.27	31	Yes	No
WTL-7	PFO	35.144384, -89.582352	1.01	55	Yes	Yes
WTL-8	PFO	35.145040, -89.582198	0.19	55	Yes	Yes
WTL-9	PFO	35.145120, -89.592356	0.23	20	Yes	No
WTL-10	PFO	35.138940, -89.591235	0.20	63	Yes	No
P-1	POW	35.144572, -89.592449	0.01	n/a	No	No

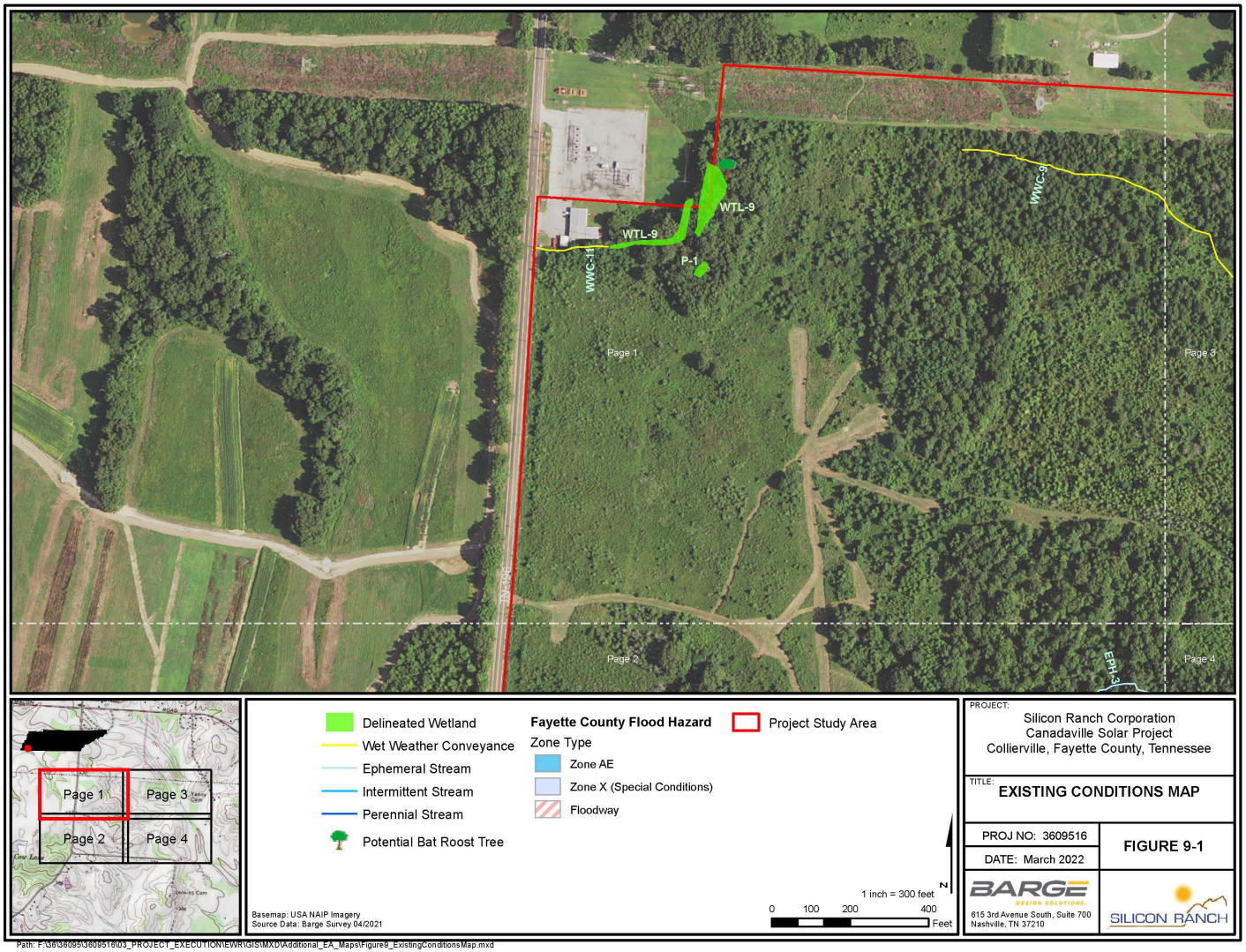

Figure 9-1. Environmental Features

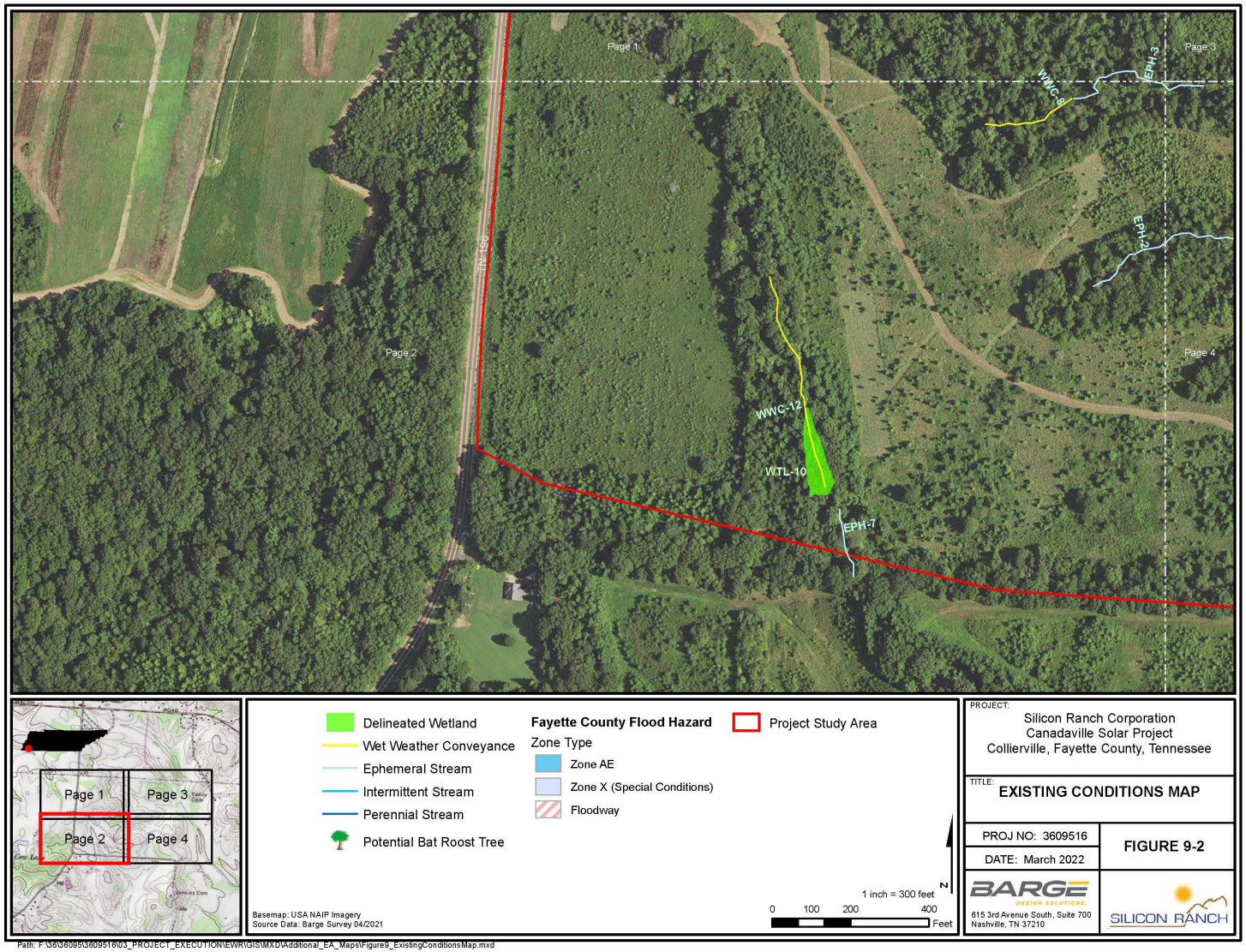

Figure 9-2. Environmental Features

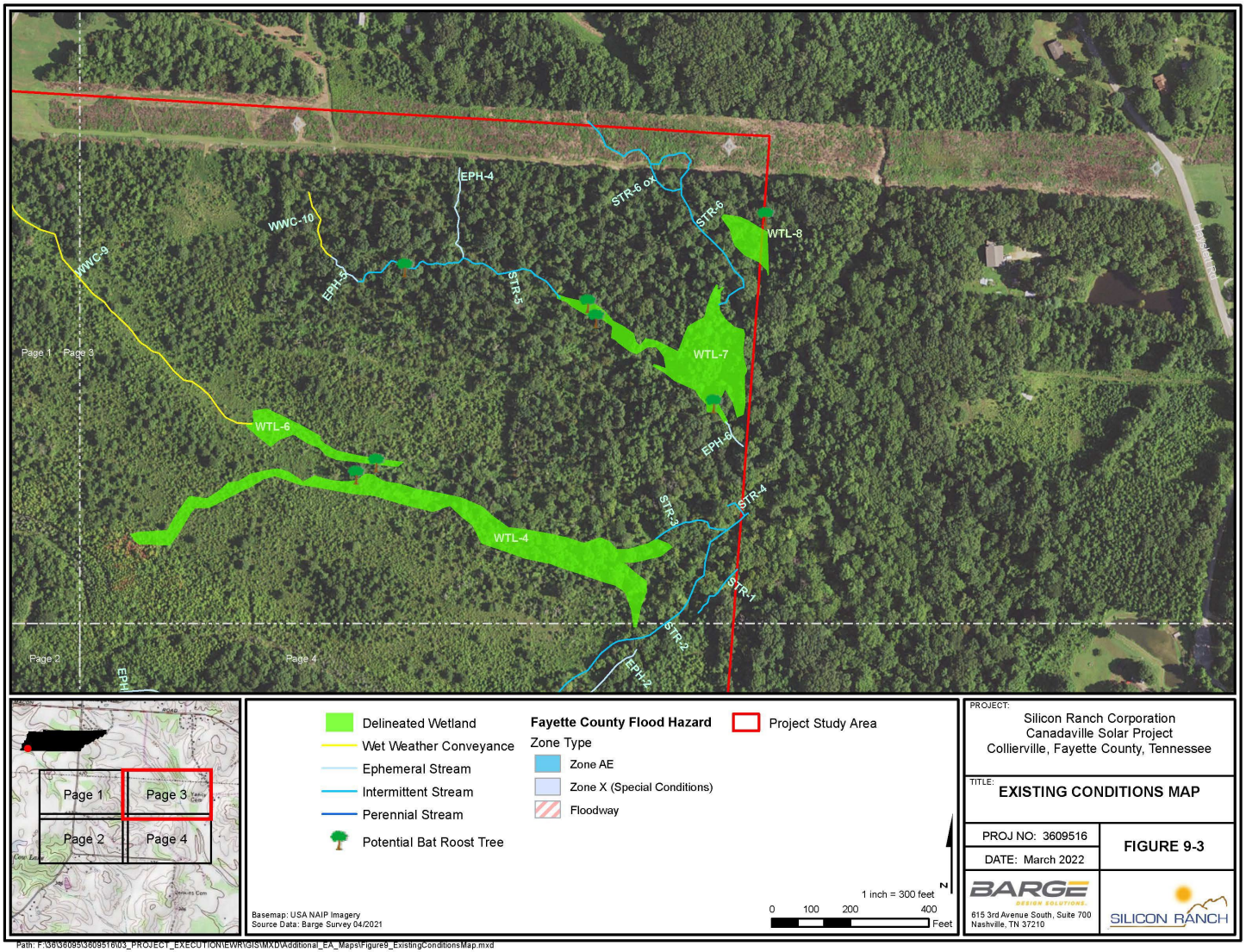

Figure 9-3. Environmental Features

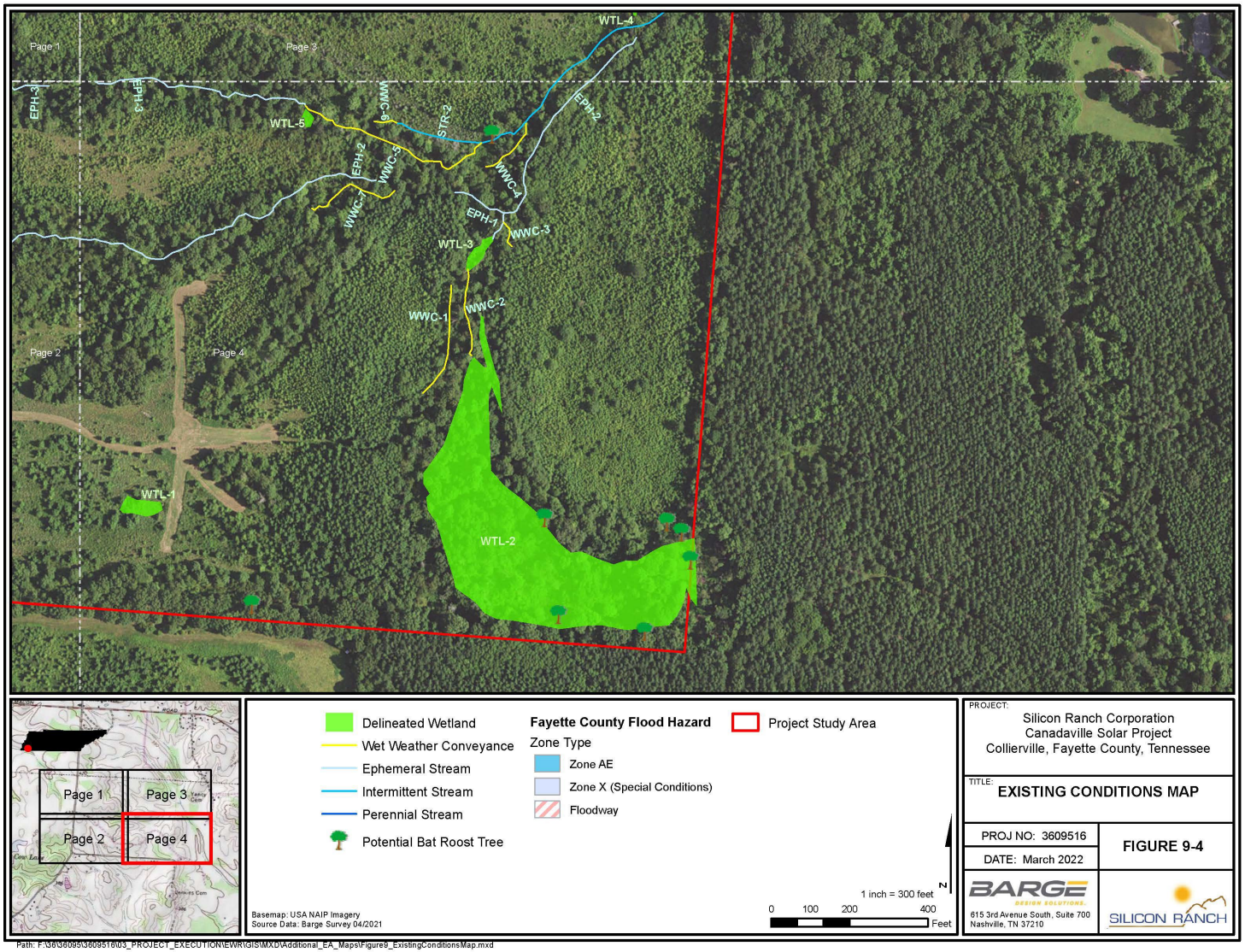

Figure 9-4. Environmental Features

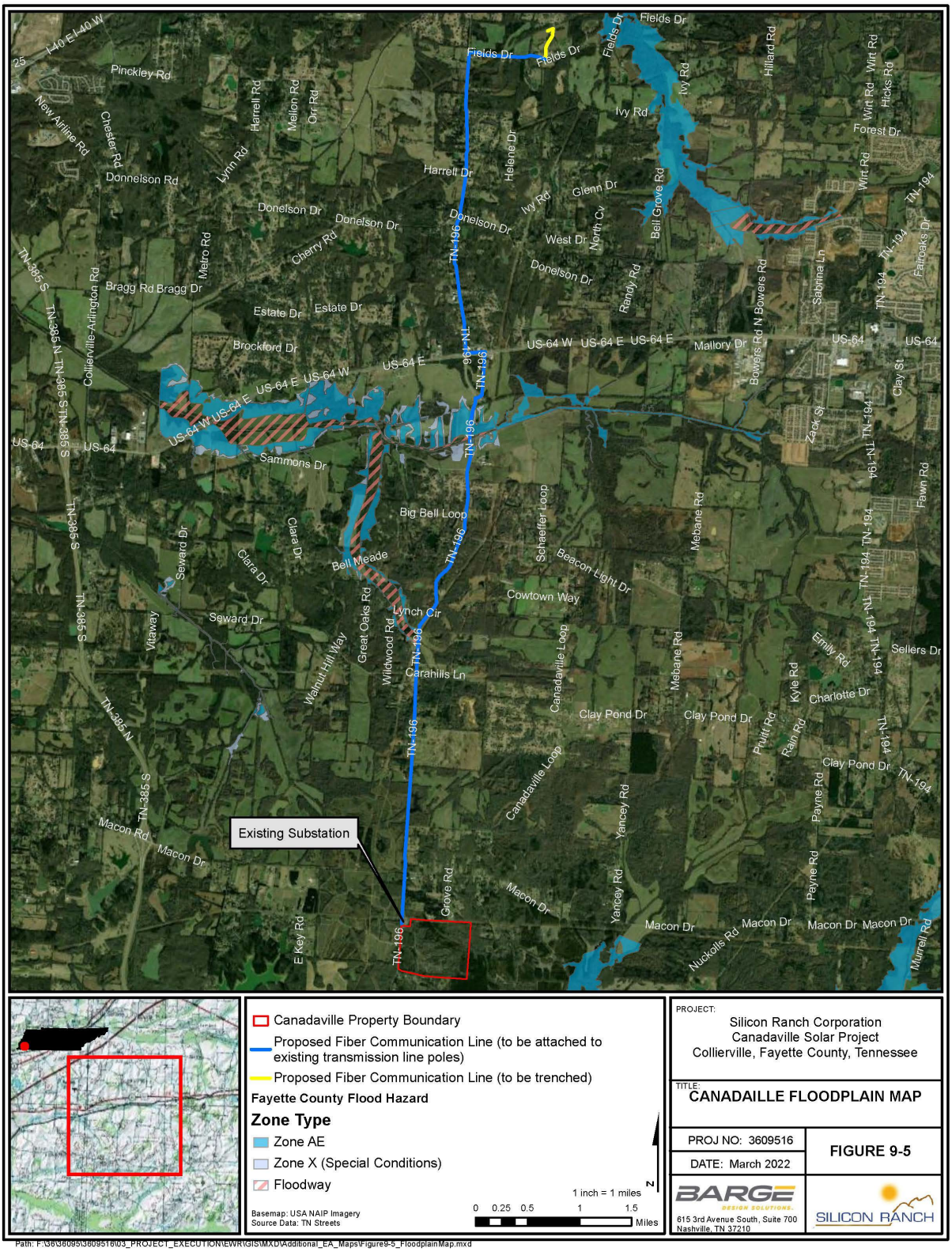

Figure 9-5. Environmental Features

In addition to the wetlands identified, 6 intermittent streams (STR), 7 ephemeral channels (EPH), and 12 WWCs were delineated within the project study area. These features were determined based on secondary indicators while conducting the Hydrologic Determination. All WWCs on this site were characterized by very little sorting of substrate and mostly hard pack loamy soil on the bed of the feature. Water was not observed within the WWCs throughout the site, and no OHWM was observed in these features. The EPHs identified throughout the site were characterized by surface saturation/small pools of water within the feature, faint to moderate OHWM, slight sorting of substrate, and no aquatic biota in the feature. The STRs delineated on the site often had pooled surface water or slightly flowing water throughout the feature. Many of the STRs appeared to have a connection to groundwater which contributed to the flowing nature of some segments. Much like the EPH features, these STRs did not contain aquatic biota within their channels. Bed and bank was strong on each of these features, and all but STR-6 had a scoured bed with sorting of soft sediment in pockets throughout. STR-6, from the southern edge of the ROW to its connection to WTL-7, was heavily sediment laden with a biological/algal film on the surface in multiple sections. Table 5 describes the streams delineated on-site.

Table 5. Stream Features Delineated during Canadaville Field Survey

Waterbody I.D.	Description	Location Within Project Boundaries	Estimated Amount of Aquatic Resource in Project Site	HD Score	State Jurisdiction	Federal Jurisdiction
STR-1	Intermittent	Start 35.142461, -89.582533 End 35.142779, -89.582214	157 LF	21.25	Yes	No
STR-2	Intermittent	Start 35.141528, -89.585055 End 35.143174, -89.582138	1,198 LF	23.75	Yes	Yes
STR-3	Intermittent	Start 35.142968, -89.582919 End 35.143048, -89.582316	205 LF	21.00	Yes	Yes
STR-4	Intermittent	Start 35.143218, -89.582317 End 35.143152, -89.582168	62 LF	21.00	Yes	Yes
STR-5	Intermittent	Start 35.144694, -89.58553 End 35.144631, -89.583809	607 LF	24.00	Yes	No
STR-6	Intermittent	Start 35.145876, -89.583626 End 35.144624, -89.582452	932 LF	23.75	Yes	Yes
EPH-1	Ephemeral Channel	Start 35.14074, -89.584206 End 35.140925, -89.58412	76 LF	17.00	No	No
EPH-2	Ephemeral Channel	Start 35.140266, -89.588917 End 35.142191, -89.583046	2,011 LF	17.50	No	No
EPH-3	Ephemeral Channel	Start 35.141575, -89.589145 End 35.141628, -89.585846	977 LF	16.00	No	No
EPH-4	Ephemeral Channel	Start 35.145517, -89.584702 End 35.144885, -89.584642	246 LF	16.25	No	No
EPH-5	Ephemeral Channel	Start 35.144858, -89.585768 End 35.144694, -89.58553	99 LF	16.25	No	No
EPH-6	Ephemeral Channel	Start 35.143639, -89.582201 End 35.143809, -89.582358	79 LF	15.75	No	No
EPH-7	Ephemeral Channel	Start 35.138175, -89.590866 End 35.138644, -89.591013	181 LF	16.00	No	No
WWC-1	Wet Weather Conveyance	Start 35.139646, -89.584755 End 35.140407, -89.584545	297 LF	9.75	No	No
WWC-2	Wet Weather Conveyance	Start 35.13992, -89.584349 End 35.140524, -89.584409	228 LF	9.50	No	No

Waterbody I.D.	Description	Location Within Project Boundaries	Estimated Amount of Aquatic Resource in Project Site	HD Score	State Jurisdiction	Federal Jurisdiction
WWC-3	Wet Weather Conveyance	Start 35.140694, -89.584038 End 35.140863, -89.584122	74 LF	9.25	No	No
WWC-4	Wet Weather Conveyance	Start 35.141245, -89.584289 End 35.141575, -89.583959	170 LF	10.50	No	No
WWC-5	Wet Weather Conveyance	Start 35.141628, -89.585846 End 35.141411, -89.584332	531 LF	7.75	No	No
WWC-6	Wet Weather Conveyance	Start 35.141534, -89.585254 End 35.141528, -89.585055	61 LF	11.50	No	No
WWC-7	Wet Weather Conveyance	Start 35.140911, -89.585761 End 35.141055, -89.585058	258 LF	9.50	No	No
WWC-8	Wet Weather Conveyance	Start 35.141377, -89.589884 End 35.141577, -89.589159	243 LF	12.00	No	No
WWC-9	Wet Weather Conveyance	Start 35.145479, -89.590262 End 35.143668, -89.586393	1,419 LF	11.25	No	No
WWC-10	Wet Weather Conveyance	Start 35.145306, -89.585981 End 35.144861, -89.58577	185 LF	9.50	No	No
WWC-11	Wet Weather Conveyance	Start 35.144708, -89.593251 End 35.144682, -89.593861	184 LF	10.25	No	No
WWC-12	Wet Weather Conveyance	Start 35.140254, -89.591676 End 35.138796, -89.59114	566 LF	9.25	No	No

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 (EO 11988, 1977).

Figure 9-5 shows the Fayette County, Tennessee, Floodplain Map and the proposed project site. There are no identified or unmapped floodplains within the proposed project site. There are two floodplains, Cypress Creek Tributary B and Cypress Creek, that overlap with the existing TL corridor. Fayette County, Tennessee Flood Insurance Rate Map Parcel Numbers 47047C0290C, 47047C0280C and 47047C0165C, all effective November 5, 2008, depict the floodplains in the overall project area.

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 on streams and wetlands. SR Canadaville will obtain appropriate permits from TDEC and USACE and mitigate tree clearing in wetlands to a minimal effect. No floodplains were identified at the project site. Therefore, no impacts to floodplains are anticipated. However, the existing TL crosses two floodplains. Because the existing TL is elevated over both floodplain crossings, no impacts to the floodplains are expected from adding FCL to the existing TL poles.

Groundwater

Direct adverse impacts to the supply and availability of groundwater are not anticipated with implementing 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 various other chemicals commonly used for general construction. An SPCC Plan would minimize the potential for leaks or spills to occur and provide countermeasures for spill response. Appropriate BMPs would be followed, and the introduction of sediment to the receiving waters would be minimized.

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

The proposed substation modifications would be within the existing substation footprint, so no impacts to groundwater are anticipated from these modifications. The installation of FCL on existing TL poles in the ROW will not impact groundwater. A portion of the fiber line would be trenched and backfilled with native soil. Due to shallow ground disturbances for trenching, no impacts to groundwater are anticipated.

Surface Waters and Wetlands

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 an SWPPP.

The average 30-foot and 60-foot buffers are proposed around the wetlands and streams respectively, in order 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 during the construction phase.

Additionally, impervious buildings and infrastructure prevent rain from percolating through the soil and result in additional runoff of water and pollutants into storm drains, ditches, and streams. Clearing vegetation and ground cover, and the addition of impervious surfaces, could likely amplify the current stormwater flows. This increased flow rate would be properly treated by implementing proper BMPs and diverting stormwater discharge to ensure proper drainage.

Portable toilets would be provided for the construction workforce as needed during construction. 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 following BMPs described in the SWPPP for water-only cleaning. Proper implementation of these and other controls would result in only 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. 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, decommissioned equipment and materials, including PV panels, racks, and transformers, would be recycled. Waste would be disposed of properly per applicable local, state, and federal laws and regulations. With proper implementation of controls, the Proposed Action Alternative would be expected to have temporary minor impacts.

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. In alignment with the goals of EO 11990, no permanent structures associated with the solar facility are proposed within wetlands onsite under the Proposed Action Alternative.

Tree removal is proposed within onsite wetlands. SR Canadaville would clear approximately 102 acres of trees onsite to reduce shading on solar panels. As a result, a total of 3.92 acres of PFO and PSS wetlands would be impacted and converted from PFO/PSS to PEM habitat. Tree clearing in wetlands would be performed using non-mechanical methods, and the stumps would be left in place to avoid ground and hydric soil disturbance. Tall vegetation maintenance within the wetland would be maintained throughout the 20-year PPA to avoid shading impacts on the panels. Table 6 describes the anticipated wetland impacts resulting from the proposed tree clearing.

While the Shaws Creek and Grays Creek subwatersheds are on the 303d List, the work to place FCL on existing TLs does not involve any activity to existing surface waters or wetlands. Thus, installation of the FCL would not have an adverse effect on surface waters or wetlands.

Table 6. Wetland Tree/Shrub Clearing Impacts

Waterbody I.D.	Cowardin Classification	Approximate Aquatic Resource in Project Site (Acres)	Approximate Tree/Sapling Removal in Wetland (Acres)	Impact Type
WTL-1	PSS	0.07	0.07	Conversion
WTL-2	PFO	4.22	1.54	Conversion
WTL-3	PSS	0.05	0.05	Conversion
WTL-4	PSS	0.34	0.34	Conversion
	PFO	1.22	1.22	Conversion
WTL-5	PFO	0.01	0.01	Conversion
WTL-6	PSS	0.22	0.22	Conversion
	PFO	0.27	0.05	Conversion
WTL-7	PFO	1.01	0.21	Conversion
WTL-8	PFO	0.19	-	No Conversion
WTL-9	PFO	0.23	0.07	Conversion
WTL-10	PFO	0.20	0.14	Conversion
P-1	POW	0.01	-	No Conversion
Total Converted Wetland Area (Acres)			**3.92**	-

Due to the rate of water uptake, extensive root system, and structural integrity of trees and saplings relative to herbaceous plants, PFO and PSS wetlands function at a greater capacity to impede and hold stormwater, absorb toxins, and retain sediment. Therefore, PFO and PSS wetland conversion to PEM habitat results in reduced wetland function. However, tree clearing under the Proposed Action Alternative would be conducted per local, state, and federal wetland mandates and BMPs for forestry operations, which ensure no more than minimal impacts to the aquatic environment. SR Canadaville would contact TDEC and USACE to obtain the necessary permit(s) for the proposed tree clearing activities and mitigate for the tree clearing in wetlands.

Based on the preliminary site layout, direct impacts to WWC-2, 7, 9, 12, and EPH-2 are proposed to accommodate the solar facility and access roads. Based on the Hydrologic Determination from TDEC and Jurisdictional Determination from the USACE, these WWC and EPH channels are not jurisdictional and do not require written authorization from TDEC pursuant to Section 401 of the CWA and USACE pursuant to Section 404 of the CWA (33 U.S.C. § 1251 et seq.). The impacts to WWCs would be included and accounted for in the SWPPP submittal as part of the NPDES permit. By implementing appropriate BMPs, impacts to surface waters and aquatic life would be insignificant during construction, and no long-term adverse impacts are anticipated.

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, Floodplain Management). 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. The reinstated EO13690 reestablished the FFRMS that was put in place to "address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended."

No perennial streams were identified in the project area, or at the adjacent TVA substation; therefore, construction in those areas would avoid 100-year floodplains and would be consistent with EO 11988

The Proposed Action would also involve the installation of FCL on approximately seven miles of an existing CEC TL. The existing TL crosses identified 100-year floodplains (Zone AE) (Figure 9-5) of Cypress Creek Tributary B and Cypress Creek. The FCL would be installed near the tops of the existing trasnmission structures, and elevated well above the 100-year flood elevation at both locations, which would be consistent with EO 11988. Adding the FCL to the poles of the existing TL will not have any impact on the floodways or floodplains because the structures would be accessed using existing roadways and ROW without disturbing the ground.

3.4 BIOLOGICAL RESOURCES

This section provides an overview of existing biological resources within the proposed Canadaville site and potential impacts to biological resources that would be 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 species.

A desktop survey was performed prior to field investigations of the proposed project site. Wildlife, vegetation, and threatened and endangered (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. Photos taken during the field investigation are included in Appendix A.

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

- The Endangered Species Act (ESA) (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 EO 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 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 hunting purposes with multiple plots with planted white clover (*Trifolium repens*). The remainder of the hunting plots were also scattered with shrubland vegetation such as red cedar (*Juniperus virginiana*), blackberry (*Rubus argutus*), winged elm (*Ulmus alata*), young sweetgum (*Liquidambar styraciflua*), and miscellaneous grasses (*Poacea* spp.). In areas that were not vegetatively maintained but have been historically disturbed, shrubland was prevalent and was a mix of vegetation from the hunting plots and the surrounding forested communities.

Native woodland was also observed throughout much of the undisturbed portions of the site, especially along lowland valleys, moderate hillslopes, riparian corridors, and floodplains. These mixtures of forest communities ranged from 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), willow oak (Q. phellos*), red cedar (*Juniperus virginiana*), green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), sugarberry (*Celtis laevigatta*) American elm *(Ulmus americana*), American beech (*Fagus grandifolia*), box elder (*Acer negundo*), red maple (*Acer rubrum*), sugar maple (*Acer saccharum*), river birch (*Betula nigra*), persimmon (*Diospyros virginiana*), shagbark hickory (*Carya ovata*), black cherry (*Prunus serotina*), silver maple (*Acer saccharinum*), honey locust (*Gleditsia triacanthos*), and planted loblolly pine (*Pinus taeda*) in the tree stratum; honeysuckle (*Lonicera maakii*), privet (*Ligustrum sinense*), winged elm, and blackberry in the shrub stratum; and Virginia creeper (*Parthenocissus quinquefolia*), woodoats (*Chasmanthium latifolium*), Japanese silt grass *(Microstegium vimineum*), sensitive fern (*Onoclea sensibilis*), fowl mannagrass (*Glyceria striata*), and wingstem (*Verbesina alternifolia*) in the herbaceous stratum.

Vegetation beneath the TL ROW is consistently maintained and is a mix of grassy areas and trees with multiple road and driveway crossings. The area where the FCL will be trenched and buried is a grassy area adjacent to Amherst Drive and beneath the TVA ROW.

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 pastureland, wetlands, riparian stream buffers, and the surrounding residential and industrial environments. No caves or karst features are located within the project area. Table 7 below details some of the observed wildlife during the field investigations. This list is a preliminary species presence list for the project.

Table 7. Observed Wildlife within Project Site

Common Name	Scientific Name	Common Name	Scientific Name
Birds		**Bird Continued**	
American robin	*Turdus migratorius*	Red tailed hawk	*Buteo jamaicensis*
Barn swallow	*Hirundo rustica*	Red-winged black-bird	*Agelaius phoeniceus*
Blue jay	*Cyanocitta cristata*	Tufted titmouse	*Baeolophus bicolor*
Blue-gray gnatcatcher	*Polioptila caerulea*	Yellow warbler	*Setophaga petechia*
Blue-winged warbler	*Vermivora cyanoptera*	**Mammals**	
Brown Thrasher	*Toxostoma rufum*	Eastern chipmunk	*Tamias striatus*
Carolina wren	*Thryothorus ludovicianus*	Eastern gray squirrel	*Sciurus carolinensis*
Common grackle	*Quiscalus quiscula*	White-tailed deer	*Odocoileus virginianus*
Cooper's hawk	*Accipiter cooperii*	Racoon	*Procyonidae lotor*
Downy woodpecker	*Dryobates pubescens*	Nine banded armadillo	*Dasypus novemcinctus*
Eastern bluebird	*Sialia sialis*	Coyote	*Canis latrans*
Eastern towhee	*Pipilo erythrophthalmus*	**Reptiles**	
Eastern phoebe	*Sayornis phoebe*	Black racer	*Coluber constrictor*
European starling	*Sturnus vulgaris*	Common garter snake	*Thamnophis sirtalis*
Field sparrow	*Spizella pusilla*	Eastern box turtle	*Terrapene carolina*
Birds Continued		***Reptiles Continued***	
House finch	*Haemorhous mexicanus*	Ground skink	*Scincella lateralis*
Indigo bunting	*Passerina cyanea*	Northern water snake	*Nerodia sipedon*
Northern cardinal	*Cardinalis*	**Amphibians**	
Northern mockingbird	*Mimus polyglottos*	American toad	*Anaxyrus americanus*
Ovenbird	*Seiurus aurocapilla*	Gray treefrog	*Hyla versicolor*
Prairie warbler	*Setophaga discolor*	Green frog	*Lithobates clamitans*
Red-bellied woodpecker	*Melanerpes carolinus*	Southern leopard frog	*Lithobates sphenocephalus*
Red-eyed vireo	*Vireo olivaceus*	Upland chorus frog	*Pseudacris feriarum*
Red-headed woodpecker	*Melanerpes erythrocephalus*	**Invertebrates**	
Red-shouldered hawk	*Buteo lineatus*	Eastern black swallowtail	*Papilio polyxenes*
		Eastern tiger swallowtail	*Papilio glaucus*

Migratory Birds

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) Trust Resource website was evaluated for migratory bird species potentially present within the project site. The results are included in Appendix A.

The USFWS IPaC report identified five species of migratory birds of conservation concern that have the potential to occur in the vicinity of the project site: the cerulean warbler (*Dendroica cerulea*), Kentucky warbler (*Oporornis formosus*), prothonotary warbler (*Protonotaria citrea*), red-headed woodpecker (*Melanerpes erythrocephalus*), and wood thrush (*Hylocichla mustelina*). These are Birds of Conservation Concern (BCC), species not federally listed but that represent USFWS's highest conservation priorities. The IPaC report indicates the following: the cerulean

warbler breeds April 26 – July 20 with the highest probability of occurrence in the project site in late April; the Kentucky warbler breeds April 20 – August 20 with the highest probability of occurrence in the project site throughout April; the prothonotary warbler breeds April 1 – August 31 with the highest probability of occurrence in the project site throughout April and in late May; the red-headed woodpecker breeds May 10-September 10 with the highest probability of occurrence in the project site from early October through May and early August; and the wood thrush (*Hylocichla mustelina*) breeds May 10 – August 31 with the highest probability of occurrence in the project site April through late May and early August (USFWS, n.d. -a). Only the red-headed woodpecker was observed utilizing portions of the project site. The remaining listed birds were not identified on the site, but the mixed habitat present throughout the site may provide resources for these birds (Cornell University, 2020).

While not listed on the USFWS IPaC report as a migratory birds of conservation concern for the project site, prairie warbler (*Setophaga discolor*) was identified utilizing the open shrubby portions of the site. This species of warbler is listed as a migratory birds of conservation concern elsewhere and typically breeds similar to the Kentucky warbler and prothonotary warbler.

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

The Heritage Database 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 of the project site and county). No state or federally listed species were observed during the April 2021 site inspection. No state or federally listed bats were captured during bat mist net surveys between May 30 and June 5, 2021. Table 8 details the potentially present federal and state-protected species for the area from the heritage database query, USFWS IPaC database, and TDEC Rare Species Data Viewer.

Table 8. 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						
Osprey	*Pandion haliaetus*	None		Species of raptor that commonly forages along large bodies of water for fish in shallow water. Typically nest in large trees with supporting limbs but has been known to nest in man-made structures such as telephone poles and electric transmission poles.	Yes (Transmission Line)	S3
Amphibian						
Southern Cricket Frog	*Acris gryllus*	Rare		Grassy margins of swamps, marshes, lakes, ponds, streams, ditches, and nearby temporary pools; far SW Tennessee.	Yes (WTL-2)	S2S3
Fish						
Naked Sand Darter	*Ammocrypta beani*	Deemed Need of Management		Listed as potential historic population but is known to inhabit the Wolf River in Shelby County.	No	S2
Northern Madtom	*Noturus stigmosus*	Deemed Need of Management		Listed as potential historic population but is known to inhabit the Wolf River in Shelby County.	No	S3
Blue Sucker	*Cycleptus elongatus*	Threatened		Listed as potential historic population but is known to inhabit the Wolf River in Shelby County.	No	S2
Mollusk						
Fatmucket	*Lampsilis siliquoidea*	Rare		Slackwater with mud substrate; Wolf R (Miss R trib); west TN; may occur at Reelfoot Lk; also reported at Drakes Ck (Cumb R), Sumner County.	No	S2
Southern Hickorynut	*Obovaria arkansasensis*	Rare		Rivers with medium-sized gravel substrates and low-mod current; Wolf & Hatchie Rivers; Mississippi River watershed; west Tennessee.	No	S1

Common Name	Species	State Status	Federal Status	Habitat Type	Habitat Present	TN State Rank
Plant						
Copper Iris	*Iris fulva*	Threatened		Swamps, soggy areas of bottomland, and floodplain woodlands, low areas along ponds and sloughs, ditches along roads and railroads, and banks of drainage canals.	Yes (WTL-2 & WTL-4)	S2

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
Data Sources:
* TVA Heritage Database Query
*TDEC Rare Species Data Viewer
* USFWS IPaC

The USFWS IPaC Trust Resource website was evaluated for species potentially present within the project site. An official list of threatened and endangered species that may be affected by activities performed at this location can be found in Appendix A.

Two federally listed mammals potentially occur on the project site: the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*). No records of the Indiana bat or northern long-eared bat are known from Fayette County. The closest known northern long-eared bat records are from a summer roost approximately 10 miles away. The closest known Indiana bat record is a record from a maternity roost approximately 38 miles away. Winter habitats (hibernacula) used by these species include caves, mines, and cave-like structures (USFWS, n.d. -a). 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.).

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 for 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. -b).

The survey for potential suitable roosting habitat (Phase 1 of the Range-Wide Indiana Bat Survey Guidelines (USFWS 2020)) was performed concurrently with the surface water delineation in April 2021. No suitable caves or potential hibernacula sites for any federally listed bat species were observed in the project area. Trees larger than three inches in diameter at breast height with exfoliating bark or crevices suitable for roosting were identified as potential roosting trees. A total of 15 potential bat roost trees were observed and documented within the wooded portions of the project site (Figures 7a-7d). A bat habitat map is provided in Appendix B. There are approximately 123 acres of woodland onsite. Of this, approximately 26.68 acres were qualified as “good” quality habitat, 47.85 acres were qualified as “marginal” quality habitat, and 48.13 acres were identified as “poor” quality habitat. Habitat quality was based on roosting suitability of trees, density of forest midstory, and proximity to water sources.

Given the potential amount of woodland clearing and that potential roost trees were identified, Jackson Group was contracted to complete a Phase 2 Presence/Absence Survey using mist netting for both listed species within the project area following the 202 Range-Wide Indiana Bat Summer Survey Guidelines (USFWS 2020). A total of 18 net nights took place. No bats were captured. The report is provided in Appendix C.

No bald or golden eagle nests were identified on-site, nor are records of these species known from Fayette County. Therefore, the Bald and Golden Eagle Protection Act (BGEPA) is not included in the relevant laws and rules to the Proposed Action Alternative.

The monarch butterfly (*Danaus plexippus*) is federally listed as a candidate species (USFWS, n.d. -c). The larval form of this species requires milkweed plants as that is its sole food source. No milkweed was observed on the site. There is minimal suitable foraging habitat on the project site and along the TL ROW. The area to be trenched is mostly open. However, it is regularly maintained by mowing thus reducing the opportunity for milkweed to recruit into the area.

Regarding the threatened plant potentially present within the project site, the copper iris (*Iris fulva*), the areas of WTL-2 and WTL-4 provide potential habitat for this species. That habitat includes swamps, soggy areas of bottomland and floodplain woodland, as well as low areas along ponds and sloughs. This area was investigated for the presence of this species. No specimens were observed at the time of the site visit.

Of the remaining terrestrial animal species, only the southern osprey (*Pandion haliaetus*) and cricket frog (*Acris gryllu*) had potential habitat on site (TWRA, n.d. -a). The TL that runs along the northern limit of the project site could potentially provide suitable nesting platforms. However, no nests were observed along the northern TL or the proposed fiber optic route for the project.

According to the Tennessee Wildlife Resources Agency (TWRA), “the Southern Cricket Frog is found in southwest Tennessee near semi-permanent bodies of water including shallow ponds with vegetation, meadows, creeks, and roadside ditches” (TWRA, n.d. -b). This habitat was observed in WTL-2. The species was not observed, nor were any auditory signs heard while on-site.

The TDEC rare species list identified two rare clams that have the potential to occur in the vicinity of the project site: the fatmucket (*Lampsilis siliquoidea*) and the southern hickorynut (*Obovaria arkansasensis*). These aquatic species require flowing perennial stream habitat and potentially large reservoir habitat. Therefore, no formal presence/absence survey of these listed species was performed for the aforementioned freshwater mussel species.

The naked sand darter (*Ammocrypta beani*), northern madtom (*Noturus stigmosus*), and blue sucker (*Cycleptus elongatus*) are noted to inhabit the Wolf River outside of the project site. The presence of the listed species was not expected within the intermittent channels located on the site.

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 federal or state threatened and endangered species or wildlife would occur. No vegetation would be disturbed or removed under the No Action Alternative.

3.4.2.2 Proposed Action Alternative

Vegetation

Under the proposed action, the removal of approximately 102 acres of forested vegetation would be required for the site's development. A map depicting the proposed tree clearing is provided in Appendix A. Following construction of the solar facility, the remaining project area would be maintained to prevent vegetation from growing above panel height.

Considering the large amount of similar vegetation types in the area, both regionally and locally, clearing the existing vegetation would be regarded as minimal and insignificant impacts. The surrounding area consists of similar vegetation communities, and the effects of the conversion of open land with areas maintained for hunting 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 will be maintained to prevent vegetation from growing above the panel height, converting some woody dominated vegetation communities to herbaceous species, and maintaining some open, cleared areas.

No adverse impact to unique vegetation communities is anticipated. Vegetation impacts 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 will be placed in designated disturbed areas, providing more flowering plants than previously occurred on-site. The Proposed Action Alternative would not significantly contribute to the spread of exotic or invasive species.

BMPs and appropriate erosion controls would be used as needed to minimize exposure of soil and limit erosion of soil from the project site. Disturbed areas would be seeded and stabilized post-construction. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has become well-established and soil stabilized.

As the TVA substation upgrades would occur within the footprint of the existing substation and the installation of FCL would attach to existing TL structures along the TL ROW, no impact to vegetation is anticipated. The FCL will be trenched and buried in a grassy area adjacent to Amherst Drive. Any grass disturbed by trenching and burying the FCL will be replaced by the contractor.

Wildlife

Wildlife present at the time of construction would be impacted, particularly when heavy machinery is used for vegetation clearing and driving piles. This machinery 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. These effects would be more likely to occur if activities took place during breeding/nesting seasons or winter hibernation periods when animals are immobile in shallow burrows. Habitat removal would likely disperse mobile wildlife into surrounding areas to find new food sources and shelter sources and reestablish territories. Those animals able to use early successional habitats could return to the site upon completion of the project. Approximately 65 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 impacted by the proposed actions.

Red-headed woodpecker and prairie warbler, which are migratory bird species of conservation concern, were observed within the shrub thickets and areas adjacent to the forested areas of the project site. Because there no restrictions on the timing of the proposed vegetative clearing, impacts to these species would occur if vegetation is removed during breeding seasons (late summer – March).

Overall, direct impacts on wildlife would be minor and insignificant. These impacts, while permanent, would only occur during construction, and wildlife populations may disperse to undeveloped habitats within the project site and to the surrounding available habitat. Wildlife able to use herbaceous habitat is expected to return to the site upon completion of the proposed actions. Upon completion of the project, the site will 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 will 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 is expected to return to the site upon completion of proposed actions.

The TVA substation upgrades would occur within the footprint of the existing substation, and installation of the FCL would attach to existing TL structures along the existing TL ROW. Neither would impact wildlife. The approximate 1,983 feet of trenched and buried fiber line may displace some wildlife during construction, but suitable habitat is available in the undeveloped portions of the site and on adjacent properties. However, once the FCL is buried, no further impacts to wildlife are anticipated.

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

Two federally listed mammals, the Indiana bat and the northern long-eared bat, were identified as potentially present within the project area. One insect, the monarch butterfly, is federally listed as a candidate species that was not observed but could potentially be present in the project area.

Approximately 58 acres of potentially suitable summer roosting habitat for Indiana bat and northern long-eared bat would be removed. Wetlands, streams, and forested areas offer suitable foraging habitat for these species. Field mist net surveys comprising 18 net nights performed in August did not result in any captures of Indiana bat or northern long-eared bat. No suitable winter roosting habitat for these species occurs in the action area. Consultation with USFWS under Section 7 of the Endangered Species Act was completed on May 9, 2022. Due to probable absence of the northern long-eared bat and Indiana bat as determined by mist net survey efforts, the USFWS concurred that proposed actions may affect but are not likely to adversely affect these two bat species (Appendix E).

Monarch butterflies were recently listed as a candidate species under the Endangered Species Act. There are no Section 7 requirements for this species as a candidate species, and no monarch butterflies or milkweed habitats were observed on-site. Due to the limited amount of suitable habitat that currently occurs on the site, the proposed action would jeopardize the continued existence of the monarch butterfly.

Following removal of the panels and completion of the project, if the land is left open, it would be replaced with early successional habitat, which may provide more flowering plants, including milkweed species, than previously occurred on site. While no significant impacts are anticipated, proposed actions may ultimately benefit this species by providing suitable foraging habitat.

Eight Tennessee state-listed species that potentially occur within the project site are listed as either rare, deemed in need of management, threatened, and/or endangered (Table 8). These species include the osprey, southern cricket frog, naked sand darter, blue sucker, northern madtom, fatmucket, and southern hickorynut. Potential habitat for the threatened species copper iris was identified in two wetlands. However, no occurrence was noted during the April 2021 wetland delineation surveys which occurred within the early portion of the flowering season for iris species. No other iris species were observed during the onsite surveys with similar appearance and habitat requirements as the copper iris. It is anticipated that copper iris is not present within WTL-2 and WTL-4 or the project study area. Therefore, impacts to copper iris are not anticipated with the development of this project. The identified wetland areas may be temporarily disturbed when forested vegetation would be removed by hand. The soils and hydrology of this wetland and buffer would not be altered during construction and operation. Following any hand-clearing, the wetlands areas and buffer would remain undisturbed. No adverse impact to unique vegetation communities is anticipated.

Habitat for a state-listed rare southern cricket frog was identified in one location (WTL-2). This wetland may be temporarily disturbed when forested vegetation is hand-cleared; however, the soils and hydrology will not be permanently altered. While canopy shade would be removed in this specific area, this species could still use the wetland as wetland function would not be permanently altered.

As the TVA substation upgrades would occur within the footprint of the existing substation, no impact to threatened and endangered species is anticipated. The installation of FCL by attaching to existing TL structures along seven miles of existing TL ROW would not be expected to impact protected species and relative habitat. Additionally, no raptor nests were observed along the TL or within the site. Proposed actions would not impact osprey or state listed aquatic species.

3.5 VISUAL RESOURCES

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

Visual resources are the characteristics of a place, both natural and man-made, 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 visible environment from a particular vantage point.

3.5.1 Affected Environment

The project site, located in rural Fayette County, is mostly flat vacant land used for hunting. Several hunting stands were identified on-site. No houses or other structures were identified on-site. The site is surrounded by forested land and agricultural and rural development. SR 196/Chulahoma Road borders the western boundary of the site. Forested land borders the eastern and southern boundaries of the site. Rural residential development is located north of the site, along Macon Drive, Grove Road, Hayslett Road, and Braswell Way. Several commercial developments, including Pine Grove Farm and Landscape, The Carpet Center, and The Watson Farm Bed and Breakfast, are located north of the project site. Hiatt Construction and Wilson Blueberry Farm is located northeast of the project site, north of Macron Road. The adjoining properties have been used for agricultural and residential purposes since prior to the 1930s. To the northwest, the adjacent sheriff/fire station and electrical substation have been established

since the early to mid-1990s. There are 500-kV and 161-kV TL ROWs running east to west along the northern border of the project site.

The TL ROW follows the existing roads. The approximately 1,983 feet of trenched area will be along Amherst Drive until reaching the TVA ROW where the FCL will connect to the network on the Cordova-Diffee TL.

One natural area was listed within 5 miles of the project study area. The Herb Parsons State Fishing Lake and Wildlife Observation Area is approximately 1.5 miles to the southwest of the project study area. The Nelson Airfield is located approximately 3.8 miles west of the project. The Pegasus Field Airport is located approximately 2.6 miles northeast of the project site. Both are small landing strips in rural areas.

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 and land use would be expected to remain unchanged.

3.5.2.2 Proposed Action Alternative

The Proposed Action Alternative would result in installing approximately 48,702 individual solar panels arranged over roughly 157 acres on the 223-acre site. At full extension, these panels are roughly 10 feet in height, depending on grade, and would comply with the county minimum setback of 30 feet from the property boundary. Construction of the solar facility would alter the visual character of the project site. Heavy machinery would be present during construction and would change 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 and the site has been stabilized.

Capital Airspace Group prepared a glint and glare analysis using the Solar Glare Hazard Analysis Tool (SGHAT) to identify potential glare impacts. The SGHAT analyzes the potential for glare over the calendar year in one-minute intervals from when the sun rises above the horizon until the sun sets below the horizon. The analysis was intended to identify the glare that could exist and determine if the glare would adversely impact the surrounding properties, vehicles traveling along nearby roadways, or along the approach paths for Nelson Airfield (TN99) and Pegasus Field Airport (7TN4). 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 glint and glare analysis is provided in Appendix D.

The SGHAT results do not predict glare occurrences along the Runway 09 or Runway 27 approach path for Nelson Airfield or along Runway 08 or Runway 26 for Pegasus Field Airport. Because neither airport has an air traffic control tower (ATCT), the proposed solar arrays will not have an ocular impact on ATCT personnel.

The SGHAT assessed the potential for glare occurrences at 64 discrete observation points for nearby residences. 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 64 observation points at either viewing height.

For roads, the SGHAT assessed the potential for glare occurrences along four routes, SR 196/Chulahoma Road, SR 193/Macon Drive, Grove Road, and Hayslett Road. 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 roadways at either viewing height.

Overall, the visual alteration to a solar facility is anticipated to result in minor adverse glare occurrence impacts. Development of the site would require the removal of forested vegetation within the property limits. Visual impacts during the construction phase would be minor in the immediate vicinity due to existing tree buffers around the project boundary. During the project's operational phase, visual impacts would be minor due to vegetated buffers separating the panels from SR 196/Chulahoma Road., SR 193/Macon Drive, and Grove and Hayslett Roads.

Since the TVA substation upgrades would be constructed within the footprint of the existing substation, no visual impacts would occur from the modifications. The addition of the FCL along the existing TVA 161-kV TL ROW utilizing existing poles would not alter the existing visual landscape within the existing TL easement. There would be temporary visual impacts related to trenching and burying the FCL. Once the construction is completed, there would be no permanent visual impacts associated with the FCL upgrades.

3.6 NOISE

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

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 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 dBA is commonly used as a threshold level for noise levels which could result in adverse impacts, and prolonged exposure to levels above 65 dBA is considered unsuitable for residential areas (U.S. Environmental Protection Agency [USEPA] 1974).

3.6.1 Affected Environment

The proposed project would be developed on a 223-acre tract east of SR 196/Chulahoma Road in Fayette County, Tennessee. Surrounding major noise sources would come from the operation of the Fayette County Sheriff Substation which houses ambulance, fire, and police services, and the surrounding roadways. The junction of SR 193/Macon Road with SR 196/Chulahoma Road is approximately 0.5 miles north of the project site.

Approximately 70 structures are within a half-mile of the project site boundary. There are no residences or sensitive noise receptors within 200 feet of the project site. The nearest residence

is more than 250 feet south of the project site located along SR 196. One residence with outbuildings is located approximately 300 feet north of the existing 500-kV TL, and two residences are located over 500 feet east of the project site.

The TL interconnection would be constructed adjacent to the project site and the existing Fayette County Sheriff Substation along SR 196/Chulahoma Road. The noise surrounding the TL is primarily from existing road traffic.

Noise regulations were reviewed for Fayette County, and no numerical limits were identified for the project.

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

The Proposed Action Alternative would result in short-term noise production related to construction activities. Construction equipment typically results in a maximum noise level within the range of 80-90 dBA, dropping to 71-81 dBA at 300 feet and 50-60 dBA at 1,000 feet. Nearby residents could experience elevated noise levels caused by construction equipment. However, construction noise would be of short duration and likely not exceed the 71-81 dBA noise level at nearby houses for prolonged periods. The construction work associated with pile driving will be the loudest and occur intermittently during daylight hours. Other construction-related noise would remain under 65 dBA for nearby residences. Work would generally occur six days per week (Monday through Saturday) from 7 am to 6 pm.

Noise impacts associated with construction of the interconnection would be temporary, occurring when trucks transport cable and crews splice to connect and install the on-site substation. Elevated noise levels would be temporary and would only occur during daytime hours.

Maintenance activities, primarily mowing, would result in noise periodically; however, this noise would be similar to existing noises near the project site. During operation, the proposed inverters would produce minimal noise onsite near the existing Canadaville, Tennessee, 161-kV substation and Fayette County Sheriff Substation. Noise generated from the new Canadaville solar substation is anticipated to be minimal, resulting in insignificant noise to area residences.

No noise-related impacts are anticipated from the proposed TVA substation upgrades. The construction and operation of the TL interconnection will not significantly affect the adjacent TL ROW and Fayette County Sheriff substation along SR 196/Chulahoma Road. Minor, temporary increases in noise will occur from construction vehicles and equipment needed to add the FCL to the existing TL poles.

Overall noise impacts resulting from the Proposed Action Alternative would be minimal.

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 that would be 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 the protection and enhancement of 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 IRP 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. 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 located in or near these areas may be subject to more stringent air permitting requirements. A listing of the NAAQS is presented in Table 9 (USEPA, n.d. -a). National standards other than annual standards are not to be exceeded more than once per year (except where noted).

Table 9. NAAQS Table

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	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	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA, n.d. -a Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m^3).

(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 NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

(4) The previous SO_2 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 SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 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.

Based on available ambient air quality data, Fayette County is currently in attainment for all criteria pollutants and meets federal and state air quality standards (USEPA, n.d. -b). Based on Air Quality Statistics (current as of May 5, 2021), Fayette County air quality data was not available (USEPA, n.d. -c).

The project site and surrounding area in rural Fayette County are used predominately for hunting, agriculture, and rural residences. There is a combination of agricultural, residential, and infrastructure development (road and TL ROWs and government offices) surrounding the project site. Denser development is located approximately three miles southwest in Collierville. Fayette County has no active air quality monitoring sites listed in USEPA's national database for NAAQS-regulated pollutants. Inactive Ozone and Lead monitoring sites are located over 15 and 10 miles respectively, from the subject property. One inactive NO2 monitoring site is approximately three miles west of the project site in Shelby County (USEPA, n.d. -d).

3.7.1.2 Regional Climate

For Collierville, Tennessee, the closest city to the project site, long, hot, and muggy summers are followed by short, cold, and wet winters. It is partly cloudy most of the year. Annual temperatures range from 32°F to 90°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. Carbon dioxide enters the atmosphere by burning fossil fuels (coal, natural gas, and oil), solid waste, trees, 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. -e).

The largest carbon dioxide source and overall GHG emissions are 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. -e).

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 forested, residential, and agricultural mix, with little effect on climate and air quality.

3.7.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, minor impacts on air quality would occur during the facility's construction. Only minimal air impacts would be expected, as construction might result in localized dust and fumes from equipment. The construction would likely involve using diesel-powered machinery that would create small amounts of airborne dust and debris. Internal combustion engines' emissions associated with diesel fuels would generate local emissions, including carbon monoxide, nitrogen oxides, 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-lived.

Approximately 157 acres of the project site would be subject to 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 the 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 substation upgrades.

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 new GHG emissions is expected as the carbon dioxide-free power generated by the solar facility would reduce the need for power that 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 constructing the Proposed Action Alternative or upgrading of the FCL. The ground below the modules is shaded, reducing the ground temperature proportionally, and lowering the ambient air temperature below the array. On a hot sunny summer day, the top side of the panels would be hot to the touch. The heat from the panels may radiate just above the panels (inches) where it cools to ambient temperature. Further, there is no research that suggests the shading below the array or the atmosphere above the array is negatively impacting the community or surrounding environments.

The Proposed Action Alternative would change the surface characteristics somewhat, but it would have little effect on soil permeability and hydrologic characteristics of the developed area. Vegetation would still grow under and around the solar panels, tending to maintain a landscape with significant evapotranspiration of precipitation instead of creating significant rainfall runoff, which happens with urban and industrial development.

Placement of the FCL on the existing TL poles will require construction vehicles and equipment to travel along the roads adjacent to the TL line to install the new fiber line. Vehicles and equipment will also be needed to trench and bury the fiber line. No tree clearing will be needed since the fiber updates would be installed in an existing/maintained easement area, and there are no trees in the area where the fiber line will be buried. This work will only have minor, short-term impacts on air quality. 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 that would be associated with the Proposed Action Alternative and No Action Alternative.

Cultural resources are prehistoric and historic archaeological sites, districts, buildings, structures, objects, and 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. 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 consider ways to avoid or minimize the adverse effect in consultation with state historic preservation officers, federally-recognized Indian tribes, and other stakeholders. If avoidance or minimization are not feasible, measures to mitigate the adverse effect must be taken.

3.8.1 Affected Environment

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 223-acre project site where the solar array is proposed for construction, including the interconnection area and the area along Amherst drive and on TVA ROW where the FCL will be buried. The Area of Potential Effects (APE) for the architectural study consisted of the 223-acre 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.

The survey was conducted to provide an inventory of resources within the survey area, descriptions of the condition of any resources identified, and recommendations regarding their NRHP eligibility. All work was consistent with the Secretary of the Interior's Standards and Guidelines for Identification (NPS, 1983) and met the minimum requirements established by the Tennessee Department of Archaeology. Previous studies did not identify any architectural resources within the APE. One historic architectural resource, the Memphis LC-1 TL, was recorded during the fieldwork, but it is not eligible for NRHP listing.

The archaeological assessment was conducted on July 28, 2021, via systematic shovel test probes (STPs) excavated at 30-meter intervals throughout the site. Positive STPs were further delineated at 10-meter intervals, and judgmental STPs were placed within field sites containing historic foundations. Of the 1,044 STPs excavated, 15 were positive for subsurface cultural materials. Twenty-two of the STPs were in the area to be trenched, and the remainder were in the project site. As a result of the survey, TVAR identified and evaluated one site on the project site, an abandoned twentieth-century house site (40FY542), and ten isolated finds. None are eligible for NRHP listing. No sites were identified where the trenching would occur.

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

The Proposed Action Alternative would not impact any listed or eligible NRHP archaeological sites. Unless plans change or new concerns are brought to light, no further archaeological or architectural investigations were recommended for the proposed project. TVA consulted with federally-recognized Indian tribes regarding the proposed activity. On April 13, 2022 the Tennessee State Historic Preservation Office (SHPO) concurred with TVA's findings for the site where the panels will be installed and the substation constructed. However, the Tennessee Historical Commission (THC) determined that the TL Memphis LC-1 is considered eligible for listing in the NRHP. THC further stated that because the work along the TL does not involve any ground disturbance there would not be an adverse effect to the TL. 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.

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 that would be associated with the No Action Alternative or Proposed Action Alternative.

3.9.1 Affected Environment

An ASTM standard E1527-13 Phase I ESA was performed on the project site and proposed interconnection area in April 2021. The GeoSearch Radius Report did not identify any sites within the search radius. No Recognizable Environmental Conditions (RECs) were identified for further investigation.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the No Action Alternative, no project-related impacts on solid and hazardous waste would occur. Existing land use would be expected to remain vacant and forested, and existing waste management conditions would be expected to remain as they are currently.

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 using contracted refuse collection and recycling services. All applicable federal, state, and local regulatory requirements would be followed to collect and dispose 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 Phase I ESA investigation, hazardous materials are not likely to be encountered during construction. Thus, no impacts are likely to arise from implementing the Proposed Action Alternative. No hazardous waste would be generated during operation of the facility.

During construction of the proposed solar facility, hazardous materials would be stored onsite 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 detailed instructions for on-site 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) per 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, and FCL would be attached to existing poles within the existing TL ROW. All applicable local, state, and federal regulatory requirements would be followed, and waste would be properly disposed of should the upgrades 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. Spills would be managed following standard procedures for spill prevention and cleanup and waste management protocols per applicable federal, state, and local requirements. Waste generated during operation would be minimal and would mainly result from equipment replacement. Nonhazardous wastes would be disposed of in an approved, operating landfill. Bulk chemicals would be stored in storage tanks or returnable delivery containers. The transport, storage, handling, and use of all chemicals would be conducted in accordance with applicable local, state, and federal laws, ordinances, regulations, and standards.

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.

While in operation, solar panels do not pose a threat to contaminate the soil. Upon expiration of the 20-year PPA or an amended or alternative PPA for the sale of power after the 20-year period, SR Canadaville would develop a decommissioning plan to document the recycling and/or disposal of solar facility components following applicable local, state, and federal laws and regulations. Impacts from hazardous waste stored at the project site 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 that would be 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 the Occupational Safety and Health Administration (OSHA).

3.10.1 Affected Environment

The project site is currently private property used primarily for hunting. There are no residences on the property. 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:

- Fayette County Sherriff Substation at 11410 Highway 196, Collierville, TN, houses the Sheriff Department, Ambulance Service, and West Fayette Fire Department adjacent to the site
- Urgent Team Walk-in Urgent Care - Bartlett, 8350 Hwy. 64 103, Bartlett, TN – approximately 14 miles west from the site
- Health Care Memphis, 1121 Poplar View Ln N #1, Collierville, TN - approximately 13 miles southwest from the site
- NHC Somerville, 308 Lake Dr, Somerville, TN – approximately 18 miles northeast from the site
- Jackson-Madison County Regional Health Department, 804 North Pkwy, Jackson, TN – approximately 60 miles northeast of 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 a vacant forested land for hunting. No changes to existing public health and safety would occur.

3.10.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, during construction, workers on the project site would have an increased safety risk. Standard construction site practices such as establishing and maintaining health and safety plans to comply with OSHA regulations would be developed to reduce risk. Health and safety plans emphasize BMPs for site safety to minimize risk to construction staff. These plans may include the 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 provide detailed instructions for on-site personnel on how to contain and clean up any potential spills. Hazardous materials stored on the 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.

The solar project is not anticipated to cause electromagnetic interference levels such that there will be impacts on nearby residents. SRC intends to design, construct, and operate the electrical systems of the proposed solar project using standard industry practices with sufficient setbacks to reduce or eliminate electromagnetic frequency and interference exposure to adjacent property owners.

Potential public health and safety hazards could result in increased traffic on nearby roadways due to site construction. 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 are anticipated from the proposed TVA substation upgrades. There could be increased safety hazards from increased traffic on public roadways during construction/installation of the fiber line. These impacts would be localized to sections of the TL being worked on and would be short-term.

No public health or safety hazards are anticipated due to the construction and operation of the Proposed Action Alternative, substation interconnection, and installation of the FCL.

3.11 TRANSPORTATION

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

3.11.1 Affected Environment

The project site is east of Fishersville, west of Macon, and north of Rossville, Tennessee. More specifically, the site is east of and adjacent to SR196/Chulahoma Road and approximately 0.5 mile south of the junction with SR 193/Macon Road. The area is largely rural and characterized by nearby wooded, commercial, residential, and agricultural areas.

Adjacent to the site's northwest corner is the Fayette County Sherriff Substation that houses the Sheriff Department, Ambulance Service, and West Fayette Fire Department. The nearest residence is more than 250 feet south of the project site located along SR 196. Residences accessible from SR 193 include one residence with outbuildings situated approximately 300 feet north of the existing 500-kV TL and two residences located over 500 feet east of the project site on wooded property.

The Nelson Airfield is approximately four miles west of the project site. The Pegasus Field Airport is located 2.6 miles northeast of the project site.

There are no existing Tennessee Department of Transportation (TDOT) stations immediately adjacent to the project site to provide traffic volume at the project site at nearby intersections. However, TDOT traffic count data was obtained from stations along the nearest roads that intersect approximately 0.7 miles from the project study site. SR 193/Macon Road annual average daily traffic (AADT) registered 4,439 vehicles/day west of the intersection with SR 196. SR 196/Chulahoma Road north of the intersection with SR 193 AADT includes 2,428 vehicles/day (TDOT, n.d.). The values provided are AADT volumes 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 are then statistically corrected by a seasonal variation factor that considers the 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 forested and grassed 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 Nelson Airfield and the Pegasus Field Airport. The distance between the airports and the proposed solar facility, coupled with the roadways between the airport and project site, serve to minimize any effects the construction of the proposed solar facility may have on air transportation. The operation of the solar facility would not affect commercial air passenger or freight traffic in the region.

During construction of the solar facility, approximately 100 to 150 workers would be present at the site from 7 am to 6 pm, up to six days a week (Monday through Saturday) for approximately eight months. A majority of the workers would likely come from the local or regional area; 25 to 50 percent of the workforce would likely come from out-of-state. Many would stay in local hotels near or within Collierville, Tennessee. Workers would either drive their vehicles or carpool to the project site. Parking would be on the 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 approximately 15 vehicles per day during construction.

Traffic flow around the worksite would be heaviest at the beginning of the workday, at lunch, and the end of the workday. Deliveries and most workers would access the project site from SR 196/Chulahoma Road. Coordination with the county ambulance and sheriff would be done as needed to allow for these services to access the site. Should traffic flow be a problem for local residences or businesses, SR Canadaville would consider staggering work shifts to space out traffic flow to and from the project site. The use of such mitigation measures would minimize potential adverse impacts to traffic and transportation to less than significant levels.

Several on-site 16-20-foot-wide maintenance roads would be constructed and maintained on the project site. These roadways would serve as periodic access for site inspection and maintenance but would be closed to through traffic.

No impacts to transportation are anticipated from the proposed TVA substation upgrades. Public access roads would be used during construction. Potential traffic congestion would be temporary during construction and return to existing traffic patterns during operation. There could be increased traffic congestion on public roadways during construction/installation of the FCL. These impacts would be localized to sections of the TL being worked on and would be short-term.

The proposed solar facility would not be staffed during operation but will be inspected weekly. Maintenance would be required quarterly 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.

3.12 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section describes an overview of existing socioeconomic conditions and environmental justice considerations that would be 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 to avoid disproportionate impacts to those populations. While TVA is not listed as a federal agency subject to EO 12898, TVA typically addresses environmental justice concerns through its NEPA analysis for federal projects.

The proposed project is in southwestern Fayette County, Tennessee. Census Tracts (CT) 607.01 and 607.02 comprise the southwest portion of Fayette County. CT 607.01 is primarily a rural area and includes the project site. CT 607.02 includes the more developed areas of Piperton and Rossville.

Based on U.S. Census data available through the EPA's EJSCREEN, 253 people live within a one-mile radius of the project site, approximately 0.6 percent of the Fayette County population of 40,164 (U.S.Census Bureau, n.d.). Tables 10 and 11 below provide a breakdown of the relevant population, income, and poverty data.

Table 10. Project Site Population

CANADAVILLE SOLAR PROJECT POPULATION DATA					
	Population	**Minority Population**			
Geography	Total	White	Percent White	Minority	Percent Minority
Tennessee	6,829,174	5,006,712	73.3%	1,822,462	26.7%
Fayette County, Tennessee	40,164	27,319	68%	12,845	32%
Census Tract 607.01	2,146	1520	71%	626	29%
1-Mile Radius - Project Site	253	185	73%	68	27%

Sources:

*U.S. Census Bureau. Census Reporter; 2014-2018 ACS 5-year estimates. Accessed September 9-10, 2021. https://censusreporter.org/profiles/05000US47047-fayette-county-tn/

*USEPA. EJSCREEN. Accessed September 9-10, 2021. Available at: https://ejscreen.epa.gov/mapper/

The recorded population within the one-mile radius is predominantly white, with 73 percent reporting race as white and 27 percent minority (USEPA, 2020). The reported minority population within the one-mile radius is only two percentage points lower than the Census Block and five

percent lower than the Fayette County minority population of 32 percent. The minority population ratio for the state is similar to that of the project site vicinity.

Table 11. Project Site Income and Property

CANADAVILLE SOLAR PROJECT INCOME AND POVERTY DATA						
	Median and Per Capita Income			Poverty Level		
Geography	Total Households	Median Household income	Per capita income	Population for whom poverty status is determined	Population below poverty level	Percent below poverty level
Tennessee	2,654,737	$56,071	$31,224	6,829,174	922,176	13.9%
Fayette County, Tennessee	15,596	$60,711	$33,383	41,133	5,327	13.5%
Census Tract 47047060701	937	$66,133	$45,785	2,146	130	6.1%
1-Mile Radius - Project Site	115	N/A	$43,143	N/A	N/A	N/A

Sources:

*U.S. Census Bureau. Census Reporter; 2014-2018 ACS 5-year estimates. Accessed September 9-10, 2021. https://censusreporter.org/profiles/05000US47047-fayette-county-tn/

*USEPA. EJSCREEN. Accessed September 9, 2021. Available at: https://ejscreen.epa.gov/mapper/

Within one mile of the project site, a slightly higher per capita income of $43,143 and $45,785 for the Census Tract has been reported compared to the Fayette County per capita income of $33,383. While median household income within one-mile of the project site is not reported at this level through EJSCREEN, it is noted that the median household income within Fayette County is $60,711, which was greater than the state average, but slightly less than the nation as a whole ($56,071 and $64,994, respectively).

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 Fayette County would occur. Further, no disproportionate impacts to the low-income or minority populations in the vicinity of 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 100 to 150 workers would be employed during construction, lasting approximately eight months. Construction of the proposed facility could have short-term beneficial economic impacts due to the purchase of materials, equipment, and services and a temporary increase in employment, income, and population. While minority and low-income populations are prominent in the vicinity of the solar facility, the overall Project impacts would primarily occur during the eight-month construction period and would be minor, and off-site adverse impacts would be negligible. As such, no disproportionately high or adverse direct or indirect impacts on minority or low-income populations due to human health or environmental effects are expected to result from the Proposed Action.

No impacts to socioeconomics or environmental justice would occur from the proposed installation of the FCL.

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 through the increased property taxes due to site improvements.

3.13 CUMULATIVE 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, farmlands, noise, and air quality 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). 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.

As described above, the construction and operation of the solar facility under the Proposed Action Alternative would result in minor direct impacts to land use, geological resources, water resources, biological resources, visual resources, noise, air quality, public health and safety, and transportation. This solar facility would not impact the existing infrastructure capacity, allowing additional industrial development in the vicinity of the project site, and would improve electrical system resiliency.

There are no known planned projects in the area that would likely contribute to cumulative impacts associated with the proposed solar facility. Desktop research of potential past, present, and future actions in the Fayette County, Tennessee, area was conducted. Resources examined included:

- TDOT transportation projects
- TVA environmental reviews website
- Local and regional news sources
- Fayette County; City Governments of Piperton and Rossville; Towns of Somerville and Collierville government website records

Tennessee DOT 2020-2023 Tennessee Transportation Improvement Plan (TDOT, 2019) was reviewed for potential present and future actions within the vicinity of the project site. While no projects in the vicinity of the proposed solar facility were identified, a Somerville Beltline two-lane bypass (STIP 2024010) is identified in the 25-Year Plan to connect highways southwest of Somerville. As this is in the planning stages, project-related transportation is not anticipated to be affected, and no adverse cumulative impacts would be anticipated associated with TDOT transportation projects.

Based on TVA's website, one solar farm (Yum Yum Solar Facility) in Fayette County and an upgrade to the existing Freeport 161-kV TL (in neighboring Shelby County) projects are planned. These projects have been studied for potential impacts, and environmental clearances have been issued. Within Fayette County, two solar farms are currently operating and selling power through PPAs with TVA: the 20-MW Wildberry Solar Center, near Moscow, and the 2.7-MW DC Somerville

Solar facility in Somerville. No cumulative impacts would be anticipated from these current and proposed TVA projects. The proposed Canadaville solar facility is a separate and independent utility from the Yum Yum Solar Facility and the Wildberry Solar Center.

Review of website records of Fayette County, Tennessee, government and Chamber of Commerce; City Governments of Piperton and Rossville, and Towns of Somerville and Collierville indicated area intermodal transportation projects have been improved transportation and commercial sites are available. There are no known recent or planned state and local projects in the project site vicinity. In summary of current and existing known activities, no adverse cumulative impacts have been identified.

CHAPTER 4

4.0 LIST OF PREPARERS

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Involvement: NEPA compliance and review

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Experience: 10 years of NEPA experience
Involvement: Preparation of the EA

Brooke Davis (TVA)
Experience: 22 years of professional experience in NEPA and environmental compliance
Involvement: NEPA Project Manager / NEPA Compliance

Brittany Kunkle (TVA)
Experience: 3 years of professional experience in NEPA and environmental compliance
Involvement: NEPA Compliance

Neil Schock (TVA)
Experience: 12 years aquatic ecology, permitting and NEPA compliance
Involvement: EA review

Adam Dattilo (TVA)
Experience: 16 years in ecological restoration and plant ecology, 9 years in botany
Involvement: Vegetation review

Elizabeth B. Hamrick (TVA)
Experience: 18 years conducting field biology, 13 years technical writing, 9 years NEPA and ESA compliance
Involvement: Terrestrial Ecology, Threatened and Endangered Species review

Craig Phillips (TVA)
Experience: 12 years sampling and hydrologic determination for streams and wet weather conveyances, 11 years in environmental reviews
Involvement: Aquatics review

Carrie Williamson (TVA)
Experience: 6 years Floodplains, 3 years River Forecasting, 2 years NEPA Specialist, 7 years compliance monitoring.
Involvement: Floodplains review

Michaelyn Harle, PhD (TVA)
Experience: 19 years in cultural resource management
Involvement: Cultural Resources, Section 106 compliance

Zach Buecker, PWS QHP (TVA)
Experience: 12 years in Wetlands Assessments, Stream Assessments, Wetlands Regulations, and/or NEPA Compliance
Involvement: Wetlands review

CHAPTER 5

5.0 REFERENCES

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