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HILLSBORO SOLAR

DRAFT ENVIRONMENTAL IMPACT STATEMENT

TENNESSEE VALLEY AUTHORITY
KNOXVILLE, TENNESSEE

January 2025

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COVER SHEET

Hillsboro Solar

Proposed action:	The Tennessee Valley Authority (TVA) proposes to execute a power purchase agreement (PPA), subject to satisfactory completion of all applicable environmental reviews, with Hillsboro Solar, LLC, for the power generated by the proposed 200-megawatt (MW) alternating current (AC) solar photovoltaic (PV) facility, known as Hillsboro Solar, in Lawrence County, Alabama. The proposed solar facility would be connected to the TVA electrical transmission system by TVA and constructed, operated, maintained, and eventually decommissioned by Hillsboro Solar, LLC.
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Lead agency:	Tennessee Valley Authority
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Comments due date:	March 3, 2025

Abstract: To meet customer demand for increased renewable generation, TVA proposes to execute a PPA with Hillsboro Solar, LLC, a wholly owned subsidiary of Urban Grid Solar, to purchase 200 MW AC of power generated by a proposed solar PV facility called Hillsboro Solar, on the north side of U.S. Highway 72 Alternate/State Route 20 between Courtland and Hillsboro, Alabama. The facility would occupy approximately 1,610 acres of a 3,779-acre Project Site that is mostly agricultural land with areas of woody wetlands and deciduous forest. Associated actions include the construction of an electrical substation and the interconnection of the facility to an existing TVA transmission line that extends east–west through the Project Site. Hillsboro Solar, LLC would construct, operate, and maintain the facility. This environmental impact statement evaluates the environmental impacts of the Proposed Action, i.e., the construction, operation, maintenance, and decommissioning of Hillsboro Solar, and the No Action Alternative, under which TVA would not execute the PPA, Hillsboro Solar, LLC would not develop the solar facility, and TVA would meet customer renewable energy demand by other actions.

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EXECUTIVE SUMMARY

Purpose and Need for Action

In June 2019, the Tennessee Valley Authority (TVA) completed an Integrated Resource Plan (IRP) and associated environmental impact statement (EIS) to determine how TVA would meet the demand for electricity in the TVA service territory over the next 20 years, while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts (TVA 2019). The 2019 IRP recommends the expansion of solar generating capacity of up to 14 gigawatts by 2038, depending on the level of load growth and other factors. TVA proposes to execute a power purchase agreement (PPA) with Hillsboro Solar, LLC to purchase the 200 megawatts (MW) alternating current (AC) of power generated by a proposed solar photovoltaic (PV) facility called Hillsboro Solar, to help fulfill the renewable energy goals established in the 2019 IRP.

Alternatives

In this EIS, TVA assesses a No Action Alternative and a Proposed Action Alternative. Under the Proposed Action Alternative, TVA would purchase the 200 MW AC of power generated by Hillsboro Solar, a proposed solar PV facility on the north side of U.S. Highway 72 Alternate (US 72A)/State Route 20 (SR 20) between Courtland and Hillsboro, Alabama, through a 20-year PPA with Hillsboro Solar, LLC. The facility would occupy approximately 1,610 acres of a 3,779-acre Project Site that is mostly agricultural land with areas of woody wetlands and deciduous forest. An additional 50 acres of the Project Site would be maintained as species-rich native plant meadow areas. The facility would connect to TVA's existing adjacent Trinity–Nance 161-kilovolt (kV) transmission line (TL), proposed to be renamed Trinity–Bride's Hill (Line [L]5832), that extends east–west through the Project Site. To interconnect to TVA's existing electrical grid, Hillsboro Solar, LLC would build a new on-site Hillsboro III Solar, AL 161-kV substation (Hillsboro III Solar substation), TVA would build a new on-site Bride's Hill, AL 161-kV switching station (Bride's Hill switching station), and TVA would replace the existing overhead ground wire (OHGW) with new fiber-optic overhead ground wire (OPGW) along an approximately five-mile portion of L5832 and an approximately seven-mile portion of the Wheeler HP–Nance 161-kV TL, proposed to be renamed Wheeler–Bride's Hill (L5669). A new up to 700-foot-long Bride's Hill–Hillsboro III Solar 161-kV TL (L5495) would connect the Hillsboro III Solar substation and Bride's Hill switching station to L5832. Most of the TL upgrades would occur within 145 acres of the existing right-of-way and access roads outside of the Project Site (TL Upgrade Areas). The remaining TL upgrades occur within the Project Site. Hillsboro Solar, LLC would construct, operate, and maintain the facility for up to a 20-year period, at which point decommissioning efforts would proceed or additional operating options would be considered.

Under the No Action Alternative, TVA would not execute the PPA, Hillsboro Solar, LLC would not develop a solar facility at this location, and TVA would meet renewable energy demand by other actions.

Affected Environment

The proposed solar PV facility would be on the north side of US 72A/SR 20 in an unincorporated portion of northeastern Lawrence County, between the towns of Courtland and Hillsboro. The topography is generally flat to gently rolling terrain, with elevation generally decreasing to the north toward the Tennessee River. Several rural-residential concentrations, as well as a few small to midsized towns and cities, are in the vicinity of the

Project Site and TL Upgrade Areas. Several local, state, and federal roads provide access to the Project Site.

Current land use is primarily cultivated crops and woody wetlands on the Project Site and primarily cultivated crops, hay/pasture, and deciduous forest on the TL Upgrade Areas. The Project Site is in the Eastern Highland Rim section of the Interior Low Plateaus physiographic province and is primarily underlain by carbonate bedrock of the Mississippian Period. The carbonate bedrock geology and karst landforms in the Project Site vicinity have a high risk for sinkholes. Data generated by the Geological Survey of Alabama depicts 20 mapped sinkholes on the Project Site and five mapped sinkholes on the TL Upgrade Areas. Approximately 91 percent of the Project Site is composed of soils designated as prime farmland or farmland of statewide importance and approximately 80 percent of the TL Upgrade Areas is composed of soils designated as prime farmland or farmland of statewide importance. Six perennial streams, five intermittent streams, 12 wet weather conveyances (WWCs), 40 wetlands, and two open waters (ponds) are present on the Project Site. One intermittent stream, nine WWCs, four wetlands, and two open waters are present on the TL Upgrade Areas.

One fish species(Tuscumbia darter) and one mollusk species (round-rib elimia), both state-listed as of conservation concern, were encountered during field surveys conducted in Wheeler Branch north (downstream) of CR 387 (Browns Ferry Road), just outside of the Project Site boundaries. A total of 22 forest stands totaling approximately 749 acres on the Project Site were considered suitable summer foraging and roosting habitat for the northern long-eared bat, gray bat, Indiana bat, tricolored bat, little brown bat, and Rafinesque's big-eared bat, species either federally listed, proposed for listing, or under review for listing in accordance with the Endangered Species Act. Approximately 30 percent, 25 percent, and 45 percent of this bat habitat was categorized as high-quality, moderate quality, and low-quality habitat, respectively.

The northern terminus of the TL Upgrade Areas is within Joe Wheeler State Park. Wheeler Reservoir and Wilson Reservoir are adjacent to the northern terminus of the TL Upgrade Areas. There are a total of 249 and 274 visual receptors (viewpoints) within 0.5 mile of the Project Site and the TL Upgrade Areas, respectively, most being residences and vacant buildings. Some of the viewpoints identified may be out of the line of sight because of changes in vegetation, air quality, or angles that were not accounted for in this analysis. Prominent viewpoints surrounding the Project Site, where more concentrated visual effects from the Project could be observed, include a small rural-residential concentration along CR 387 (Browns Ferry Road) and traffic along US 72A/SR 20, Browns Ferry Road, and CR 420. Prominent viewpoints near the new up to 700-foot-long L5495 include a small rural-residential concentration along Browns Ferry Road and traffic along Browns Ferry Road and CR 420. Rural-residential noise-sensitive receptors occur around the perimeter of the Project Site, ranging from less than 190 feet to approximately 1.7 miles from proposed PV array locations. Wheeler Chapel Church, Pleasant Grove Missionary Baptist Church, Wheeler Grove Baptist Church, and Bethlehem Primitive Baptist Church are 350 feet, 3,000 feet, 3,410 feet, and 1.4 miles, respectively, from the nearest proposed PV array. Wheeler Grove Baptist Church is also 1.4 miles from the proposed Bride's Hill switching station and Hillsboro III Solar substation.

The Project Site and TL Upgrade Areas vicinity is culturally and historically important because of the pre-contact habitations along or near the Tennessee River and associations with the Deas and Whiteley route of the Cherokee Trail of Tears and the Civil War, the tenant farm occupations associated with Wheeler Station, and the changes that occurred in the 1930s related to TVA's hydroelectric efforts on the Tennessee River. Two National Register of Historic Places (NRHP)-listed properties (Bride's Hill and Wheeler Hydroelectric Project [WHP]; one NRHP-eligible property (Wheeler Station Rural Historic District [WSRHD]); three cemeteries; 45 undetermined cultural resources consisting of two pre-contact period archaeological sites, 23 historic period archaeological sites, and 20 pre-contact and historic period archaeological sites are within the archaeological area of potential effects. One NRHP-listed property (Bride's Hill) and three NRHP-eligible properties (WSRHD, Norfolk Southern Railroad, and Coleman Terry's Store/American Store) are located within view of the Project Site with two of these resources (Bride's Hill and WSRHD) located within the footprint of the Project Site. Other buildings in the vicinity of the Project include rural-residential, agricultural, and commercial buildings. Two churches are adjacent to the Project Site along US 72A/SR 20.

There are six qualifying communities (i.e., census block groups) with environmental justice (EJ) concerns in the vicinity of the Project Site and TL Upgrade Areas. Three of these communities had a higher percentage of people living in poverty than Lawrence County. Four of these communities exceeded the 50 percent minority threshold noted in Council on Environmental Quality guidance and all six of these communities had minority percentages that exceeded the county percentages. One of these communities exceeded the five percent limited English proficiency threshold noted in U.S. Department of Justice guidance.

Environmental Consequences

Overall, with the implementation of minimization and mitigation efforts, environmental consequences associated with the Proposed Action Alternative would be minor to moderate. During construction of the solar facility, minor temporary adverse impacts to land use, air quality, utilities, waste management resources, public and occupational health and safety, traffic, and communities with EJ concerns and moderate temporary adverse impacts to visual resources and the ambient noise environment would occur. During construction and operation of the solar facility, minor adverse impacts to geology, soils, water quality, aquatic life, and vegetation would occur. During TL upgrade activities, minor temporary adverse impacts to parks and recreation and utilities, minor to moderate temporary adverse impacts to visual resources, and moderate temporary adverse impacts to the ambient noise environment would occur. During operation of the solar facility, minor long-term adverse impacts to land use and populations of migratory bird species of concern; moderate long-term adverse impacts to prime farmland and visual resources; minor beneficial impacts to soils, groundwater, and vegetation; long-term beneficial impacts to greenhouse gas emissions; minor long-term beneficial impacts to electrical services across the region; and long-term beneficial impacts to economics and population in Lawrence County would occur.

The Proposed Action, when considered with the past, present, and reasonably foreseeable future actions, could have minor adverse cumulative impacts to geology, soils, water quality, federally listed species, utilities, and communities with EJ concerns; minor to moderate adverse cumulative impacts to recreation and visual resources; moderate adverse cumulative impacts on land use; moderate to large adverse cumulative impacts to prime farmland and transportation; minor beneficial cumulative impacts to air quality; and short- to long-term moderate beneficial cumulative impacts to socioeconomics and communities with EJ concerns.

The conversion of 1,309 acres of prime farmland and 151 acres of farmland of statewide importance to nonagricultural uses during the construction and operation of the solar facility would not impact the prime farmland and farmland of statewide importance designations on the land, but loss of production would result in moderate adverse impacts. However, the 2,846 acres of farmland removed from row cropping during the lifetime of the Project represents 1.4 percent of the 209,398 acres of farmland in Lawrence County, and following decommissioning of the solar facility, the Project Site could be returned to agricultural use with little reduction in soil productivity or impacts to prime farmland.

The Project would permanently affect 1,349 linear feet of four WWCs due to the proposed installation of solar arrays, entailing piling placement and grading where necessary for solar array or central inverter installation, and road crossings, including dewatering if necessary and construction of access roads. Permanent impacts to 1.62 acre of five forested wetlands within the 200-foot-wide area surrounding proposed panel locations would be caused by clearing to reduce solar panel shading. These wetlands would be permanently impacted by conversion from a forested wetland to an emergent wetland, but no loss of function would occur due to the implementation of mitigation measures.

Minor impacts to vegetation would occur due to conversion of row crops to permanent grass and herbaceous cover and clearing of up to 95 acres of forested land and additional tall vegetation. Habitat of common wildlife species and state-listed species of conservation concern would be disturbed; however, impacts are anticipated to be minimal to negligible due to the presence of suitable habitat immediately adjacent to the Project Site. Up to 76 acres of habitat suitable for bat species would be impacted due to forest clearing. The establishment and maintenance of up to 50 acres of species-rich native plant meadows would promote pollinator habitat on the Project Site and benefit a variety of animal classes including insects, birds, and other wildlife.

The visual alteration from agricultural land to a large solar facility in an area where scenic attractiveness is rated as typical or common and scenic integrity is rated as moderate to high due to the relative unity of the surrounding natural and cultural character would likely result in moderate adverse visual impacts. The scenic attractiveness rating would change to indistinctive of a rural agricultural and rural residential area and the scenic integrity rating would change to low to moderate. The establishment of the narrow strips of species-rich native plant meadow areas surrounding or adjacent to blocks of solar arrays could partially offset the visual impacts, although it would not obscure the adjacent security fencing or nearby solar arrays in early morning or late afternoon. Overall, the visual effects of the built facility would likely be moderate due to, in many instances, the unobstructed visibility of portions of the Project elements. Visual effects from the Project would be minor on a larger scale, due to variation of the visual attributes of the Project Site as distance from the Project increases.

TVA would install approximately five and seven miles of OPGW on L5832 and L5669, respectively. These portions of the TLs extend through a mix of rural agricultural areas with isolated single-family homes, small rural-residential concentrations, and some commercial and industrial development adjacent to highways. A helicopter would be visible to these residences during the installation of OPGW in the vicinity. Other equipment associated with the TL upgrades may also be visible. TVA would install the new up to 700-foot-long L5495 between the Hillsboro III Solar substation/Bride’s Hill switching station and L5832. The substation, switching station, and L5495 would likely be visible to some residences along Browns Ferry Road. Overall, the TL upgrade work would likely result in temporary, minor to moderate impacts to the scenery at viewpoints in the vicinity of the TL upgrade locations and long-term moderate impacts to the scenery at viewpoints in the vicinity of the substation, switching station, and L5495.

Noise-sensitive receptors near the TL Upgrade Areas would temporarily experience heightened noise during daylight hours primarily during pole drilling for the installation of four TL pole structures and the installation of OPGW by helicopter. Pole drilling activities and the installation of OPGW by helicopter would result in temporary, moderate adverse noise effects.

The Project would introduce both visual and physical adverse effects to the WSRHD that would be minimized through appropriate mitigation included in a memorandum of agreement between TVA and the Alabama Historical Commission. The Project would introduce a visual effect to the railroad segment associated with the Deas and Whiteley detachments of the Cherokee Trail of Tears. However, the effects would not be adverse due to the historic setting of the property that has already been compromised at various locations along the proposed NRHP boundary by modern development, including expansion of US 72A/SR 20, the presence of a TL corridor, and several modern buildings. The Project would introduce a visual effect to Bride’s Hill and would physically impact approximately 40 acres of the northernmost portion of the NRHP property boundary. However, the effects would not be adverse because this area has been significantly altered by the construction and maintenance of a TL corridor and recent logging activities. The Project would introduce a visual effect to the American Store, but the effect would not be adverse. The Project would introduce both visual and physical effects to the NRHP-listed WHP. However, the effects would not be adverse due to modern upgrades to this short segment of L5669, including the installation of a new structure on this segment in 2008 (Structure 1; slated for upgrades), and the proposed reconductoring of the Begin Structure (WHP Switchyard; contributing resource) that is considered a form of routine maintenance that fails to negatively impact the structure or its integrity.

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SYMBOLS, ACRONYMS, AND ABBREVIATIONS

AADT	Annual average daily traffic
AC	Alternating current
ACS	American Community Survey
ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
AHC	Alabama Historical Commission
ALDOT	Alabama Department of Transportation
ALNHP	Alabama Natural Heritage Program
ARLH	Alabama Register of Landmarks and History
AUMNH	Auburn University Museum of Natural History
APE	Area of Potential Effect
BG	Block group
BGEPA	Bald and Golden Eagle Protection Act
BIA	Bureau of Indian Affairs
Biotope	Biotope Forestry & Environmental
BLS	Bureau of Labor Statistics
CAA	Clean Air Act
CBMPP	Construction Best Management Practices Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
CR	County road
CT	Census tract
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
DBH	Diameter at breast height
DC	Direct current
DOJ	Department of Justice
EA	Environmental assessment
EIS	Environmental impact statement

EJ	Environmental justice
EMF	Electromagnetic field
EO	Executive Order
ESA	Endangered Species Act
°F	Fahrenheit
FEMA	Federal Emergency Management Agency
FR	Federal Register
FRA	Federal Railroad Administration
GHG	Greenhouse gas
GSA	Geological Survey of Alabama
HD	Hydrological determination
HDR	HDR Engineering, Inc.
HUC	Hydrologic Unit Code
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plan
JWEMC	Joe Wheeler Electric Membership Cooperative
kV	Kilovolt
L_{dn}	Day-night average sound
LEP	Limited English proficiency
LF	Linear feet
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of agreement
MPT	Main power transformer
MVT	Medium voltage transformer
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent

NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NSA	New South Associates, Inc.
NWP	Nationwide Permit
O_3	Ozone
OHGW	Overhead ground wire
OPGW	Fiber-optic overhead ground wire
OSHA	Occupational Safety and Health Administration
$PM_{2.5}$	Particulate matter whose particles are less than or equal to 2.5 micrometers
PM_{10}	Particulate matter whose particles are less than or equal to 10 micrometers
PPA	Power purchase agreement
PV	Photovoltaic
RCRA	Resource Conservation and Recovery Act
RFFA	Reasonably foreseeable future action
RMP	Risk Management Program
RNHD	Regional Natural Heritage Database
ROD	Record of Decision
ROW	Right-of-way
SAIPE	Small Area Income and Poverty Estimates
SMZ	Streamside management zone
SO_2	Sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SR	State route
TDEC	Tennessee Department of Environment and Conservation
TL	Transmission line
TVA	Tennessee Valley Authority
TVAR	Tennessee Valley Archaeological Research
TVARAM	TVA Rapid Assessment Method
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture

USEIA	U.S. Energy Information Administration
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WHP	Wheeler Hydroelectric Project
WMA	Wildlife Management Area
WMEL	West Morgan – East Lawrence Water and Sewer Authority
WOTUS	Waters of the U.S.
WSRHD	Wheeler Station Rural Historic District
WWC	Wet weather conveyance

GLOSSARY OF TERMS

100-Year Floodplain	The area subject to a one percent chance of flooding in any given year.
Ambient Air	Outdoor air in locations accessible to the general public.
Area of Potential Effects (APE)	The geographic area(s) within which an action may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.
Attainment Areas	Those areas of the U.S. that meet National Ambient Air Quality Standards (NAAQS) as determined by measurements of air pollutant levels.
Best Management Practice (BMP)	A practice chosen to minimize environmental effects to a variety of environmental resources. BMPs are typically standard practices and not customized for a particular proposed action.
Climate	A statistical description of daily, seasonal, or annual weather conditions based on recent or long-term weather data. Climate descriptions typically emphasize average, maximum, and minimum conditions for temperature, precipitation, humidity, wind, cloud cover, and sunlight intensity patterns; statistics on the frequency and intensity of tornado, hurricane, or other severe storms may also be included.
Cumulative Impacts	Impacts that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions, regardless of what agency or person undertakes such actions (40 Code of Federal Regulations [CFR] § 1508.1).
Day-Night Average Sound Level (L_{dn})	A 24-hour average noise level rating used to assess noise impacts for land uses where people sleep and there is a heightened sensitivity to nighttime noise.
Decibel (dB)	A generic term for measurement units based on the logarithm of the ratio between a measured value and a reference value. Decibel (dB) scales are most commonly associated with acoustics (using air pressure fluctuation data); but dB scales sometimes are used for ground-borne vibrations or various electronic signal measurements. The adjusted noise metric that most closely duplicates human perception of noise is known as the A-weighted dB.
Deciduous	Vegetation that sheds leaves in autumn and produces new leaves in spring.
Direct Impacts	Impacts that are caused by the action and occur at the same time and place (40 CFR § 1508.1).
Ecoregion	A relatively homogeneous area of similar geography, topography, climate, and soils that supports similar plant and animal life.
Emergent Wetland	Wetland dominated by erect, rooted herbaceous plants, such as cattails and bulrush.

Endangered Species	A species in danger of extinction throughout all or a significant portion of the species range or territory and listed as endangered by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act (ESA) and ESA's implementing regulations (50 CFR § 424).
Environmental Impact Statement (EIS)	A detailed written statement that describes a proposed action and reasonable alternatives, including no action; analyzes the potential environmental impacts associated with the proposed action and alternatives; and identifies any mitigation measures to avoid, minimize, or compensate for impacts from a proposed action.
Environmental Justice (EJ)	The just treatment and meaningful involvement of all people regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other federal activities that affect human health and the environment.
Environmentally Preferable Alternative	The alternative in a NEPA study that will best promote the national environmental policy expressed in section 101 of NEPA by maximizing environmental benefits, such as addressing climate change-related effects or disproportionate and adverse effects on communities with environmental justice concerns; protecting, preserving, or enhancing historic, cultural, Tribal, and natural resources, including the rights of Tribal Nations that have been reserved through treaties, statutes, or Executive Orders; or causing the least damage to the biological and physical environment.
Ephemeral Stream	Rain-dependent stream that flows only after precipitation.
Erosion	A natural process whereby soil and highly weathered rock materials are worn away and transported to another area, most commonly by wind or water.
Evergreen	Vegetation with leaves that stay green and persist all year.
Farmland of Statewide Importance	Land that is nearly prime farmland and that economically produces high yields of crops when treated and managed according to acceptable farming methods.
Floodplains	Any land area susceptible to inundation by water from any source by a flood of selected frequency. For purposes of the National Flood Insurance Program, the floodplain, at a minimum, is that area subject to a one percent or greater chance of flooding (100-year flood) in any given year.
Forest	Vegetation having tree crowns overlapping, generally forming 60–100 percent cover (Grossman et al. 1998).
Forested Wetland	Wetland dominated by trees.
Greenhouse Gas (GHG)	A gaseous compound that absorbs infrared radiation and re-radiates a portion of that back toward the earth's surface, thus trapping heat and warming the earth's atmosphere.

Habitat	A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.
Herbaceous Vegetation	Dominated by forbs, generally forming at least 25 percent cover; other life-forms with less than 25 percent cover (Grossman et al. 1998).
Historic Property	Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP; 36 CFR § 800.16(l)).
Indirect Impacts	Impacts that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR § 1508.1).
Intermittent Stream	Seasonal stream that flows during certain times of the year when smaller upstream waters are flowing and when groundwater provides enough water for stream flow.
Karst	An area where topography, with characteristic erosional surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terrains include sinkholes, sinking streams, caves, and large springs.
Landscape Features	The land and water form, vegetation, and structures which compose the characteristic landscape.
Landslide	A slope failure that involves downslope displacement and movement of material either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces.
Large Impacts	One of four descriptors used to characterize the level of impact in a manner that is consistent with Tennessee Valley Authority's (TVA) current practice. Refers to environmental impacts that are clearly noticeable and are sufficient to destabilize important attributes of the resource.
Liquefaction	A condition in which a saturated cohesion-less soil may lose shear strength because of a sudden increase in pore water pressure caused by an earthquake.
Minor Impacts	One of four descriptors used to characterize the level of impact in a manner that is consistent with TVA's current practice. Refers to environmental impacts that are not detectable or are so minor that they would not noticeably alter any important attribute of the resource.
Mitigation	(a) Avoiding the impacts altogether by not taking an action or parts of an action, (b) Minimizing impacts by limiting the degree or magnitude of the action and implementation, (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment, (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, (e) Compensating for the impact by replacing or providing substitute resources or environments (40 CFR § 1508.1).

Moderate Impacts	One of four descriptors used to characterize the level of impact in a manner that is consistent with TVA's current practice. Refers to environmental impacts that are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
National Ambient Air Quality Standards (NAAQS)	Uniform national air quality standards established by the U.S. Environmental Protection Agency (USEPA) that restrict ambient levels of certain pollutants to protect public health (primary standards) or public welfare (secondary standards). Standards have been set for ozone, carbon monoxide, particulate matter, sulfur dioxide, nitrogen dioxide, and lead.
National Environmental Policy Act (NEPA)	The federal law that establishes a national policy on the environment and requires federal agencies to consider the effects of their proposed actions on the environment before final decisions are made and involve the public in the decision making. NEPA does not mandate particular results or substantive outcomes.
National Historic Preservation Act (NHPA)	The 1966 federal law that establishes a national preservation program and a system of procedural protections that requires federal agencies to identify and protect historic resources, including archaeological resources, at the federal level and indirectly at the state and local level. NHPA authorizes the establishment of the NRHP.
National Pollutant Discharge Elimination System (NPDES) and Water Quality Certification	The NPDES permit program was established under the Clean Water Act (CWA) and controls, among other things, the discharge of stormwater associated with certain construction activities involving disturbance of one or more acres. In Alabama, the NPDES program has been delegated to the Alabama Department of Environmental Management. In addition, Section 401 of the CWA requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the U.S. obtain a state certification that the discharge complies with the CWA.
National Register of Historic Places (NRHP)	A list of places and objects maintained by the National Park Service based on their integrity of location, design, setting, materials, workmanship, feeling and association, and: 1) association with important historical events; or 2) association with the lives of significant historic persons; or 3) embodiment of distinctive characteristics of a type, period, or method of construction or represent the work of a master, or have high artistic value; or 4) have yielded or may yield information important in history or prehistory.
NatureServe	An international network of biological inventories (natural heritage programs or conservation data centers) that provides information about the location and status of animals, plants, and habitat communities, and establishes a system for ranking the relative rarity of those resources.
Nitrogen Dioxide (NO_2)	A toxic, reddish gas formed by the oxidation of nitric oxide. Nitrogen dioxide is a strong respiratory and eye irritant. Most nitric oxide formed by combustion processes is converted into NO_2 by subsequent oxidation in the atmosphere. NO_2 is a criteria pollutant, and is a precursor of ozone, numerous types of photochemically generated nitrate particles, and atmospheric nitrous and nitric acids.

No Action Alternative	The alternative in a NEPA study that would continue with the present course of action and in which the proposed activity would not take place. The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative are measured.
No Impact (or "absent")	One of four descriptors used to characterize the level of impact in a manner that is consistent with TVA's current practice. Refers to a resource that is not present or, if present, would not be affected by project alternatives under consideration.
Nonattainment Area	An area that does not meet a federal or state ambient air quality standard. Federal agency actions occurring in a federal nonattainment area are subject to Clean Air Act (CAA) conformity review requirements.
Notice of Intent (NOI)	A public notice that an agency prepares to signify beginning the preparation of an EIS.
Ozone (O_3)	A compound consisting of three oxygen atoms. Ozone is a major constituent of photochemical smog that is formed primarily by chemical reactions in the atmosphere involving reactive organic compounds, nitrogen oxides, and ultraviolet light. Ozone is a toxic chemical that damages various types of plant and animal tissue, and which causes chemical oxidation damage to various materials. Ozone is a respiratory irritant and appears to increase susceptibility to respiratory infections. A natural layer of ozone in the upper atmosphere absorbs high energy ultraviolet radiation, reducing the intensity and spectrum of ultraviolet light that reaches the earth's surface.
Paleontology	A science dealing with the life forms of past geological periods as known from fossil remains.
Particulate Matter (PM)	Solid or liquid material having size, shape, and density characteristics that allow the material to remain suspended in the atmosphere for more than a few minutes. PM can be characterized by chemical characteristics, physical form, or aerodynamic properties. Categories based on aerodynamic properties are commonly described as being size categories, although physical size is not used to define the categories. Many components of suspended PM are respiratory irritants. Some components such as crystalline or fibrous minerals are primarily physical irritants. Other components are chemical irritants such as sulfates, nitrates, and various organic chemicals. Suspended PM also can contain compounds such as heavy metals and various organic compounds that are systemic toxins or necrotic agents. Suspended PM or compounds adsorbed on the surface of particles can also be carcinogenic or mutagenic chemicals. See $PM_{2.5}$ and PM_{10}.
Particulate Matter ≤2.5 microns ($PM_{2.5}$) (Fine PM)	A fractional sampling of suspended PM that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 6 microns penetrate the alveoli in the lungs. In a regulatory context, $PM_{2.5}$ is any suspended PM collected by a certified sampling device having a 50 percent collection efficiency for particles with aerodynamic equivalent diameters of 2.0–2.5 microns and a maximum aerodynamic diameter collection limit less than 6 microns. Collection efficiencies are greater than 50 percent for particles with aerodynamic diameters smaller than 2.5

	microns and less than 50 percent for particles with aerodynamic diameters larger than 2.5 microns.
Particulate Matter ≤10 microns (PM_{10}) (Inhalable PM)	A fractional sampling of suspended PM that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 50 microns penetrate to the lower respiratory tract (tracheobronchial airways and alveoli in the lungs). In a regulatory context, PM_{10} is any suspended PM collected by a certified sampling device having a 50 percent collection efficiency for particles with aerodynamic equivalent diameters of 9.5–10.5 microns and a maximum aerodynamic diameter collection limit less than 50 microns. Collection efficiencies are greater than 50 percent for particles with aerodynamic diameters smaller than 10 microns and less than 50 percent for particles with aerodynamic diameters larger than 10 microns.
Perennial Stream	A stream that typically has flowing water year-round.
Photovoltaic (PV) Power Generation	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.
Physiographic Provinces	General divisions of land with each area having characteristic combinations of soil materials and topography.
Power Purchase Agreement (PPA)	A contract between two parties, one who generates and intends to sell electricity, and one who is looking to purchase electricity, defining the commercial terms for the sale of electricity between the two parties.
Preferred Alternative	The action alternative in a NEPA study which the agency believes would fulfill the agency’s statutory mission and responsibilities, considering economic, environmental, technical and other factors, and would meet a proposed project’s purpose and need.
Prehistoric	Refers to the period wherein American Indian cultural activities took place before written records and not yet influenced by contact with non-native culture(s).
Prime Farmland	Generally regarded as the best land for farming, these areas are flat or gently rolling and are usually susceptible to little or no soil erosion. Prime farmland produces the most food, feed, fiber, forage, and oil seed crops with the least amount of fuel, fertilizer, and labor. Prime farmland combines favorable soil quality, growing season, and moisture supply and, under careful management, can be farmed continuously and at a high level of productivity without degrading either the environment or the resource base. Prime farmland does not include land already in or committed to urban development, roads, or water storage.
Project Site	The 3,779-acre Project Site owned by Hillsboro Solar, LLC that would be developed as a part of the Proposed Action Alternative.

Purpose and Need	A statement by an agency in a NEPA document to describe what the agency is trying to achieve by proposing an action. The purpose and need statement explains why an action is necessary and serves as the basis for identifying the reasonable alternatives that meet the purpose and need.
Record of Decision (ROD)	The formal announcement by a federal agency, following the issuance of a final EIS, of the alternative that the agency decides to implement. The ROD includes the reasons why the agency selected the alternative, identification of the alternative with the least environmental impacts, and mitigation measures, including any enforcement and monitoring commitments, for the selected alternative.
Riverine	Having the characteristics of a river.
Row Crops	Agricultural crops, such as corn, wheat, beans, cotton, which are most efficiently grown in large quantities by planting and cultivating in lines or rows.
Scrub-Shrub	Woody vegetation less than about 20 feet tall. Species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.
State Historic Preservation Office	The official within and authorized by each state at the request of the Secretary of the Interior to act as liaison for the NHPA.
Subsurface	Of or pertaining to rock or mineral deposits which generally are found below the ground surface.
Sulfur Dioxide (SO_2)	A pungent, colorless, and toxic oxide of sulfur formed primarily by the combustion of fossil fuels. SO_2 is a respiratory irritant, especially for asthmatics. A criteria pollutant, and a precursor of sulfate particles and atmospheric sulfuric acid.
Threatened Species	A species likely to become endangered within the foreseeable future throughout all or a significant portion of the species range or territory and which has been listed as threatened by USFWS or National Marine Fisheries Service following the procedures set out in the ESA and ESA's implementing regulations (50 CFR § 424).
TL Upgrade Areas	Locations where the TVA TL upgrades would occur within 145 acres of the existing right-of-way and access roads outside of the Project Site as a part of the Proposed Action Alternative.
Upland	The higher elevation parts of a region, not closely associated with streams or lakes.
Wet Weather Conveyance	Man-made or natural watercourses, including natural watercourses that have been modified by channelization: that flow only in direct response to precipitation runoff in their immediate locality; whose channels are at all times above the ground water table; that are not suitable for drinking water supplies; and in which there is not sufficient water flow to support aquatic organisms whose life cycle includes an aquatic phase of at least two months.

Wetland	An area inundated by surface or groundwater with a frequency sufficient to support, and under normal circumstances does or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, mud flats, and natural ponds.
Wildlife Management Area (WMA)	Land and/or water areas designated by state wildlife agencies, such as the Alabama Department of Conservation and Natural Resources, for the protection and management of wildlife. These areas typically have specific hunting and trapping regulations and rules regarding appropriate uses of these areas by the public.
Woodland	Open stands of trees with crowns not usually touching, generally forming 25–60 percent cover (Grossman et al. 1998).

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Introduction and Background

The Tennessee Valley Authority (TVA) is a corporate agency of the United States (U.S.) and the largest public power provider in the country. Through TVA's partnership with 153 local power companies, TVA supplies electricity 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 in Oak Ridge, Tennessee. TVA's service area includes most of Tennessee and parts of six adjacent states. Since 1933, TVA's mission has been to serve the people of the Tennessee Valley region to make life better.

TVA proposes to execute a power purchase agreement (PPA), subject to satisfactory completion of all applicable environmental reviews, with Hillsboro Solar, LLC to purchase power from a solar photovoltaic (PV) facility known as Hillsboro Solar with a generating capacity of approximately 200 megawatts (MW) alternating current (AC). Hillsboro Solar, LLC would construct, operate, and maintain the facility for up to a 20-year period, at which point decommissioning efforts would proceed or additional operating options would be considered. Together, these actions are referred to as the Project or Proposed Action.

Components of the Proposed Action include Hillsboro Solar, LLC's construction, operation, maintenance, and eventual decommissioning of the approximately 200-MW AC solar PV facility, known as Hillsboro Solar, on the Project Site. The Project would connect to TVA's existing adjacent Trinity–Nance 161-kilovolt (kV) transmission line (TL), proposed to be renamed Trinity–Bride's Hill (Line [L]5832), that extends east–west through the Project Site. To interconnect to TVA's existing electrical grid, Hillsboro Solar, LLC would build a new on-site Hillsboro III Solar, AL 161-kV substation (Hillsboro III Solar substation), TVA would build a new on-site Bride's Hill, AL 161-kV switching station (Bride's Hill switching station), and TVA would replace the existing overhead ground wire (OHGW) with new fiber-optic overhead ground wire (OPGW) along an approximately five-mile portion of L5832 and an approximately seven-mile portion of the Wheeler HP–Nance 161-kV TL, proposed to be renamed Wheeler–Bride's Hill (L5669). A new up to 700-foot-long Bride's Hill–Hillsboro III Solar 161-kV TL (L5495) would connect the Hillsboro III Solar substation and Bride's Hill switching station to L5832. Most of the TL upgrades would occur within 145 acres of the existing right-of-way (ROW) and access roads outside of the Project Site (TL Upgrade Areas). The remaining TL upgrades would occur within the Project Site. The Project Site is on the north side of U.S. Highway 72 Alternate (US 72A)/State Route 20 (SR 20) between Courtland and Hillsboro, Alabama (Figure 1-1). The Project Site is mostly agricultural land with areas of woody wetlands and deciduous forest. As an environmental enhancement measure, Hillsboro Solar, LLC would establish and maintain up to 50 acres of the Project Site as species-rich native plant meadows. This environmental impact statement (EIS) describes the potential environmental effects associated with constructing, interconnecting, operating, maintaining, and decommissioning Hillsboro Solar on a 3,779-acre Project Site in Lawrence County, Alabama.

1.2 Purpose and Need for Action

As part of TVA's diversified energy strategy, TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. In June 2019, TVA completed an Integrated Resource Plan (IRP) and associated EIS. The 2019 IRP identified the various resources that TVA intends to use to meet the energy needs of the TVA region over a 20-year planning period while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy with fewer environmental impacts. The 2019 IRP anticipates growth of solar generating capacity in all scenarios analyzed, with most scenarios anticipating 5,000 to 8,000 MW and one anticipating up to 14,000 MW by 2038 (TVA 2019)[1]. With the demand for solar energy increasing, TVA has an expansion target of 10,000 MW of solar by 2035 (TVA 2021). The Proposed Action would provide cost-effective renewable energy consistent with the 2019 IRP and TVA goals. The Project would partially fulfill the renewable energy goals established in the 2019 IRP by providing cost-effective renewable energy.

[1] On September 27, 2024, TVA issued the draft 2025 IRP and associated draft EIS, initiating a 75-day public comment period. The 2019 IRP remains valid and guides future generation planning consistent with least-cost planning principles.

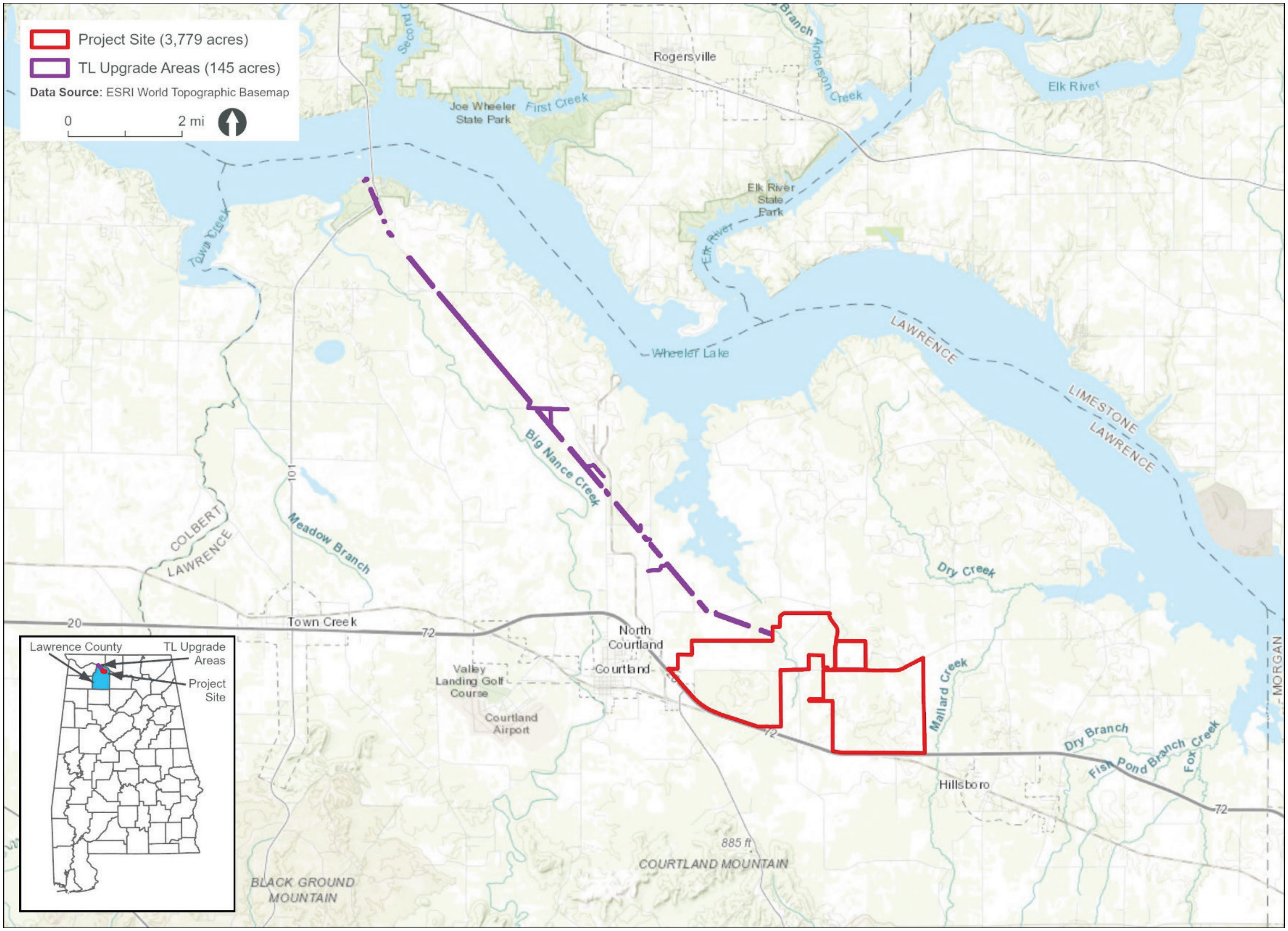

Figure 1-1. Project Location

1.3 Decision to be Made

The decision before TVA is whether to purchase the power from the proposed Hillsboro Solar site, which would result in the construction, operation, maintenance, and eventual decommissioning of the proposed solar PV facility, as well as the construction, operation, and maintenance of a substation, switching station, and associated facilities to interconnect the solar PV facility to TVA's existing electrical transmission network.

1.4 Scoping and Public Involvement

On September 1, 2023, TVA published a Notice of Intent (NOI) in the *Federal Register* announcing plans to prepare an EIS to assess the potential environmental impacts associated with constructing, operating, maintaining, and decommissioning the Project (Appendix D). The NOI initiated a 30-day public scoping period, which concluded on October 2, 2023. The NOI solicited public input on both the scope of the EIS and the environmental issues that should be considered in the EIS. The NOI also requested data, information, and analyses relevant to the proposed action. In addition to the NOI in the *Federal Register*, TVA sent notification of the NOI to local and state government entities and federal agencies; issued a Project news release via local media serving the Lawrence County area, including WALW-FM radio, *The Moulton Advertiser*, *Times Daily*, *Decatur Daily*, *Huntsville Real-Time News* (AL.com), and the *News Courier*; and posted the news release on TVA's website. TVA sent the scoping notice via email to agencies and organizations. The purpose of the scoping period was to describe TVA's proposed action and initial alternatives and solicit comments on them from the public and interested stakeholders.

During the public scoping period, TVA received comments from the National Park Service (NPS), the U.S. Environmental Protection Agency (USEPA), and four private individuals. Comments were related to alternatives; component sourcing; decommissioning and waste management; land use; soils and prime farmland; water resources; biological resources; natural areas, parks, and recreation; visual resources; cultural resources; socioeconomics; environmental justice; and cumulative impacts.

Based on internal and public scoping, identification of applicable laws, regulations, Executive Orders (EOs), and policies, TVA identified the resource areas listed below as requiring review within the EIS:

- Land Use
- Geology, Soils, and Prime Farmland
- Water Resources
  - Groundwater
  - Surface Water
  - Floodplains
  - Water Quality
- Biological Resources
  - Vegetation
  - Wildlife
  - Migratory Birds
  - Aquatic Life
  - Threatened and Endangered Species
- Natural Areas, Parks, and Recreation
- Visual Resources
- Noise
- Air Quality and Greenhouse Gas (GHG) Emissions
- Cultural Resources
- Utilities
- Waste Management
- Public and Occupational Health and Safety
- Transportation
- Socioeconomics
- Environmental Justice

The scoping process and subsequent results are described in more detail in a scoping report prepared by TVA and available at https://www.tva.com/environment/environmental-stewardship/environmental-reviews/nepa-detail/hillsboro-solar-project (TVA 2024a).

TVA has posted this draft EIS on the TVA website for a 45-day public review and comment period, published a notice of the EIS's availability in newspapers that serve the Lawrence County area, including *The Moulton Advertiser*, *Times Daily*, *Decatur Daily*, *Huntsville Real-Time News* (AL.com), and the *News Courier*, and notified local, state, and federal agencies and federally recognized tribes that the draft EIS is available for review and comment. Following the closure of the public review and comment period, TVA will carefully review all submitted comments. The subsequent final EIS will be revised as appropriate in response to the comments received and will contain TVA's responses to the comments.

1.5 Regulatory Compliance, Permits, Licenses, and Agency Coordination

The National Environmental Policy Act (NEPA; 42 U.S. Code [U.S.C.] §§ 4321 *et seq.*) requires federal agencies to evaluate the potential environmental impacts of their proposed actions. This EIS was prepared consistent with NEPA, the Council on Environmental Quality's (CEQ) implementing regulations for implementing NEPA at 40 Code of Federal Regulations (CFR) §§ 1500–1508 (89 *Federal Register* [FR] 35442, May 1, 2024), and TVA's NEPA implementing regulations at 18 CFR § 1318 (85 FR 17434, March 27, 2020). Table 1-1 presents the laws and EOs relevant to the Proposed Action by environmental resource area in addition to NEPA.

Table 1-1. Laws and Executive Orders relevant to the Proposed Action

Environmental Resource Area	Law / Executive Order
Prime Farmland	Farmland Protection Policy Act
Water Resources	Alabama Department of Environmental Management (ADEM) Administrative Code, Chapter 335-6
	Clean Water Act (CWA) Sections 401, 402, and 404
	EO 11988 – Floodplain Management
	EO 11990 – Protection of Wetlands
	EO 14008 – Tackling the Climate Crisis at Home and Abroad
	Safe Drinking Water Act
	Wild and Scenic Rivers Act Section 7
	Wild and Scenic Rivers Act Section 10

Environmental Resource Area	Law / Executive Order
Biological Resources	Alabama Department of Conservation and Natural Resources Administrative Code, Chapter 220-4
	Bald and Golden Eagle Protection Act (BGEPA)
	Endangered Species Act (ESA) Section 7 – Interagency Cooperation (consultation with U.S. Fish and Wildlife Service [USFWS])
	EO 13112 – Invasive Species
	EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds
	Migratory Bird Treaty Act (MBTA)
	EO 14008 – Tackling the Climate Crisis at Home and Abroad
Air Quality and GHG Emissions	ADEM Administrative Code, Chapter 335-3
	Clean Air Act (CAA)
	EO 13990 – Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis
	EO 14008 – Tackling the Climate Crisis at Home and Abroad
	EO 14057 – Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability
Cultural Resources	Archaeological Resources Protection Act
	National Historic Preservation Act (NHPA) Section 106
	Native American Graves Protection and Repatriation Act
Waste Management	ADEM Administrative Code, Chapter 335-13 and 14
	Comprehensive Environmental Response, Compensation, and Liability Act
	Emergency Planning and Community Right-to-Know Act Resource Conservation and Recovery Act (RCRA)
	Solid Waste Disposal Act
	Toxic Substances Control Act
Public and Occupational Health and Safety	Occupational Safety and Health Act
Environmental Justice	EO 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations
	EO 14008 – Tackling the Climate Crisis at Home and Abroad
	EO 14096 – Revitalizing Our Nation’s Commitment to Environmental Justice for All

The Proposed Action would also require federal and state permits and/or coordination, as well as certification for the proper installation of some Project components, including the associated transmission interconnection (Table 1-2). Adherence to permit or certification conditions helps to avoid, minimize, or mitigate environmental impacts, as discussed in relation to specific resource areas in Chapter 3.

Table 1-2. Permits, approvals, and coordination list

Permit/Approval/ Coordination	Justification	Lead Agency
	Federal	
Endangered Species Act (ESA) Section 7 Consultation	In compliance with Section 7 of ESA, TVA is consulting with the U.S. Fish and Wildlife Service (USFWS) on Project effects on federally listed species and habitat. Correspondence will be included in the Final EIS.	USFWS
Bald and Golden Eagle Protection Act (BGEPA)	Prohibits the take of bald and golden eagles without prior authorization by USFWS. Take includes the killing, injuring, or disturbing of eagles and eagle nests. If active eagle nests are identified, TVA would coordinate with U.S. Department of Agriculture (USDA) and/or USFWS as appropriate to develop avoidance and minimization measures and ensure compliance under federal law prior to commencement of construction activities.	USFWS
Migratory Bird Treaty Act (MBTA)	Prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by USFWS. EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to conserve migratory birds and implement the MBTA.	USFWS
Clean Water Act (CWA) Section 404 Nationwide Permit (NWP) or Individual Permit	NWPs are required for impacts to waters of the U.S. (WOTUS) (i.e., jurisdictional waters) that are less than 0.5 acre. An Individual permit is required if the impacts were to exceed 0.5 acre.	U.S. Army Corps of Engineers (USACE)
	State	
CWA Section 401 Water Quality Certification	Required for impacts to WOTUS (i.e., jurisdictional waters).	ADEM
CWA Section 402 National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit	As the construction disturbance would be greater than one acre, the Project requires a NPDES Stormwater Construction General Permit for discharges into WOTUS. This includes submission of a Notice of Intent, erosion and sediment control plans, and a site-specific Construction Best Management Practices Plan (CBMPP).	ADEM

Permit/Approval/ Coordination	Justification	Lead Agency
National Historic Preservation Act (NHPA) Section 106 Consultation	In compliance with Section 106 of NHPA, TVA is consulting with the Alabama Historical Commission (AHC), acting as the Alabama State Historic Preservation Office, and federally recognized tribes with interests in the area surrounding the Project Site and Project effects on historic properties (i.e., eligible for the National Register of Historic Places [NRHP]) and other cultural resources (Appendix C).	AHC
Permits for Accommodation of Utilities	Required for aboveground or below ground installation of utilities within state rights-of-way (ROWs).	Alabama Department of Transportation (ALDOT) Maintenance Bureau
Permit to Construct a Turnout to Provide Access to a State Highway	Required for construction of a driveway or turnout that provides access to a state highway.	ALDOT Maintenance Bureau
On-site Sewage System Permit	Required for installation of a septic system. The permit involves on-site evaluations to determine if site and soil conditions are suitable for on-site wastewater systems.	Alabama Department of Public Health
Well Installation Notification	Required for installation of a well on the Project Site.	ADEM
Burn Permit	May be required for the open burning of any vegetation cleared from the Project Site.	Alabama Forestry Commission
	County/Municipal	
Permit Agreement for the Accommodation of Utility Facilities on Public ROWs	Required for aboveground or below ground installation of utilities within public ROWs in Lawrence County.	Lawrence County Road Department
Driveway Access Permit	Required for construction of a driveway or turnout that provides access to a state highway.	Lawrence County Road Department
Flood Damage Prevention Ordinance	Required if the Project intersects a Federal Emergency Management Agency (FEMA) special flood hazard area.	Lawrence County Road Department

1.6 Environmental Impact Statement Overview

NEPA requires federal agencies to consider and study the potential environmental consequences of their proposed actions. Actions, in this context, can include new and continuing activities that are conducted, financed, assisted, regulated, or approved by federal agencies, as well as new or revised plans, policies, or procedures. The NEPA process helps federal agencies make decisions based on an understanding of a proposed action’s impacts and, if necessary, to take actions that protect, restore, and enhance the environment (40 CFR § 1500.1(c)). NEPA also requires that federal agencies provide opportunities for public involvement in providing comments on proposed actions prior to the federal decision-making process.

This EIS tiers from the TVA IRP EIS (TVA 2019), which explains TVA’s need for additional generating capacity and anticipates growth of solar generating capacity in all scenarios analyzed. The IRP EIS also compares the environmental impacts of solar generation with other types of generation and describes system-wide, non-site-specific impacts of solar generation.

TVA is preparing this EIS to assess the environmental impacts of the proposed action. TVA has used the input from the public scoping period, summarized above in Section 1.4, in developing this Draft EIS. The Draft EIS will be posted on TVA's website and distributed to interested federal, state, and local agencies, individuals, and groups, including scoping participants, for their review and comment (see Chapter 5). Following the public comment period for the Draft EIS, TVA will respond to the comments received and incorporate any necessary changes into the Final EIS.

The completed Final EIS will be posted on TVA's website, advertised in local newspapers, and notices of the EIS's availability will be sent to those who received the Draft EIS. TVA also will send the Final EIS to the USEPA, which will publish a notice of its availability in the *Federal Register*. TVA will then issue a Record of Decision (ROD) no sooner than 30 days after the notice of availability of the Final EIS; the ROD will include (1) the decision; (2) the rationale for the decision; (3) alternatives that were considered; (4) identification of the environmentally preferable alternative; and (5) associated mitigation measures, monitoring, and enforcement requirements. TVA intends to publish the Final EIS in late 2025.

CHAPTER 2 – ALTERNATIVES

TVA has determined that, from the standpoint of NEPA, there are two feasible alternatives available: the No Action Alternative and the Proposed Action Alternative. TVA considered other alternatives but determined that they would not be feasible. Non-feasible alternatives are discussed in Section 2.3.

2.1 No Action Alternative

Under the No Action Alternative, TVA would not execute the PPA, and Hillsboro Solar, LLC would not develop, operate, maintain, and decommission the proposed solar PV facility. Existing conditions (e.g., land use, natural resources, visual resources, physical resources, and socioeconomics) on the Project Site and in the vicinity would remain unchanged. TVA would continue to rely on other sources of generation described in the 2019 IRP to ensure an adequate energy supply and to meet TVA's goals for increased renewable energy generation. The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative are measured.

2.2 Proposed Action Alternative

Under the Proposed Action Alternative, TVA would execute the PPA to purchase 200 MW AC of power generated by the proposed solar PV facility called Hillsboro Solar. The facility would be within an approximately 3,779-acre Project Site in Lawrence County, Alabama. Hillsboro Solar, LLC would construct, operate, maintain, and decommission the solar PV facility within a 1,610-acre footprint that avoids cultural, biological, and physical resources to the maximum extent possible. An additional 50 acres of the Project Site would be maintained as species-rich native plant meadows. The facility would connect to TVA's existing adjacent L5832 that extends east–west through the Project Site. To interconnect to TVA's existing electrical grid, Hillsboro Solar, LLC would build a new on-site Hillsboro III Solar substation, TVA would build a new on-site Bride's Hill switching station, and TVA would replace the existing OHGW with new OPGW along an approximately five-mile portion of L5832 and an approximately seven-mile portion of L5669. A new up to 700-foot-long 161-kV TL (L5495) would connect the Hillsboro III Solar substation and Bride's Hill switching station to L5832. Together, the solar PV facility and the associated interconnection and TL upgrades are referred to herein as the Project or Proposed Action.

2.2.1 Project Description

The 3,779-acre Project Site is on the north side of US 72A/SR 20 (Figure 2-1) in an unincorporated portion of northeastern Lawrence County, between the towns of Courtland and Hillsboro (Figure 1-1). Hillsboro Solar and associated transmission interconnection components would occupy approximately 1,610 acres of the 3,779-acre Project Site (Figure 2-5). The Project Site is mostly agricultural land with areas of woody wetlands and deciduous forest. The existing L5832 crosses the northern portion of the Project Site in an east–west orientation. The Project Site is bounded to the south by US 72A/SR 20, and the western boundary is adjacent to the eastern town limits of Courtland. The perimeter of the developed facilities would be enclosed with security fencing. The undeveloped areas that are currently agricultural fields would remain undeveloped with no farming or other activities apart from the establishment and maintenance of 50 acres of species-rich native plant meadows, and all other undeveloped portions of the Project Site would be undeveloped.

The solar facility would connect to the existing adjacent L5832 via the Hillsboro III Solar substation and Bride's Hill switching station and a five-mile portion of L5832 and a seven-mile portion of L5669 would be modified through the replacement of the existing OHGW with new OPGW (Figures 2-2, 2-3, and 2-4).

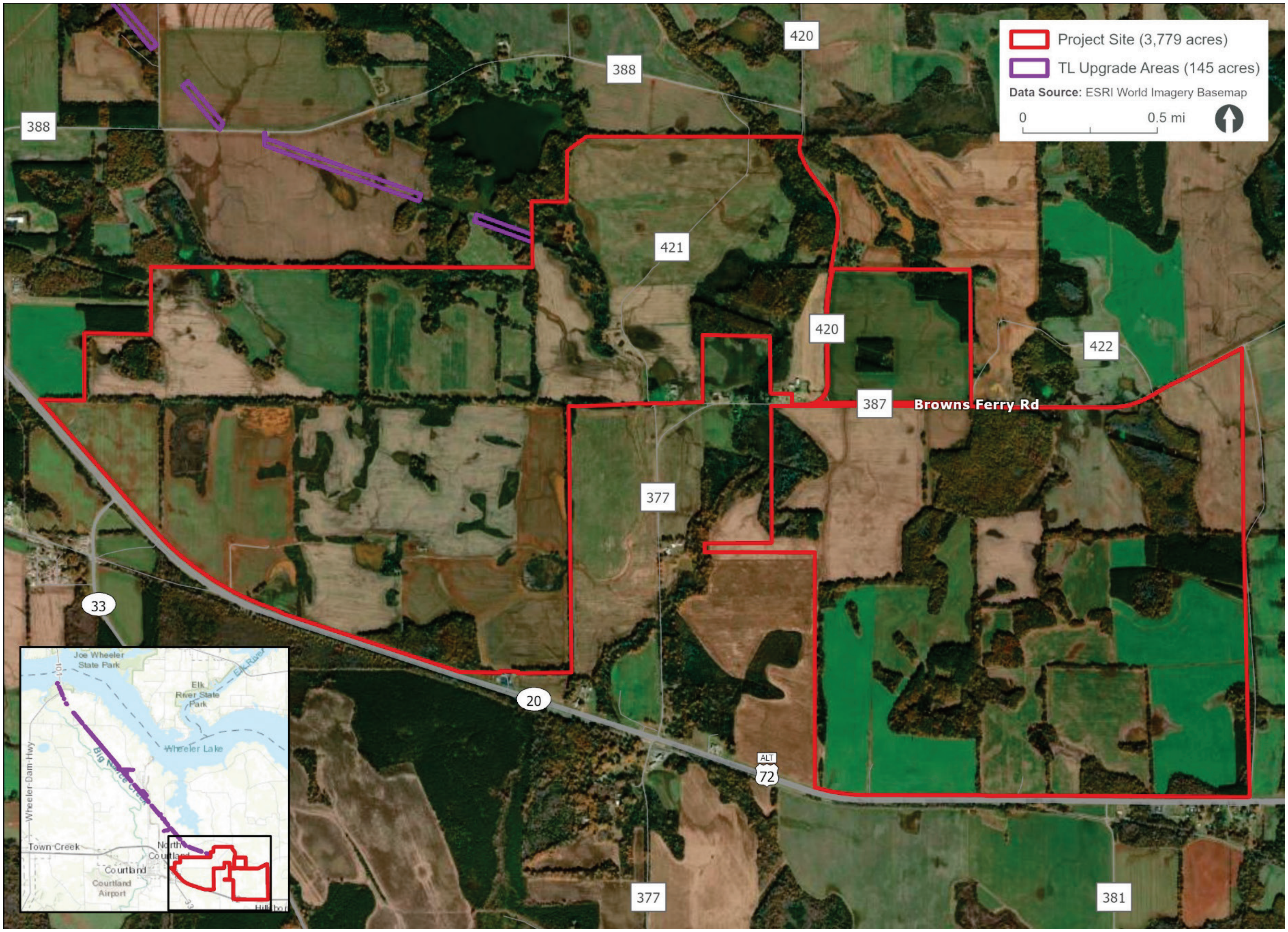

Figure 2-1. Aerial photo showing the 3,779-acre Project Site

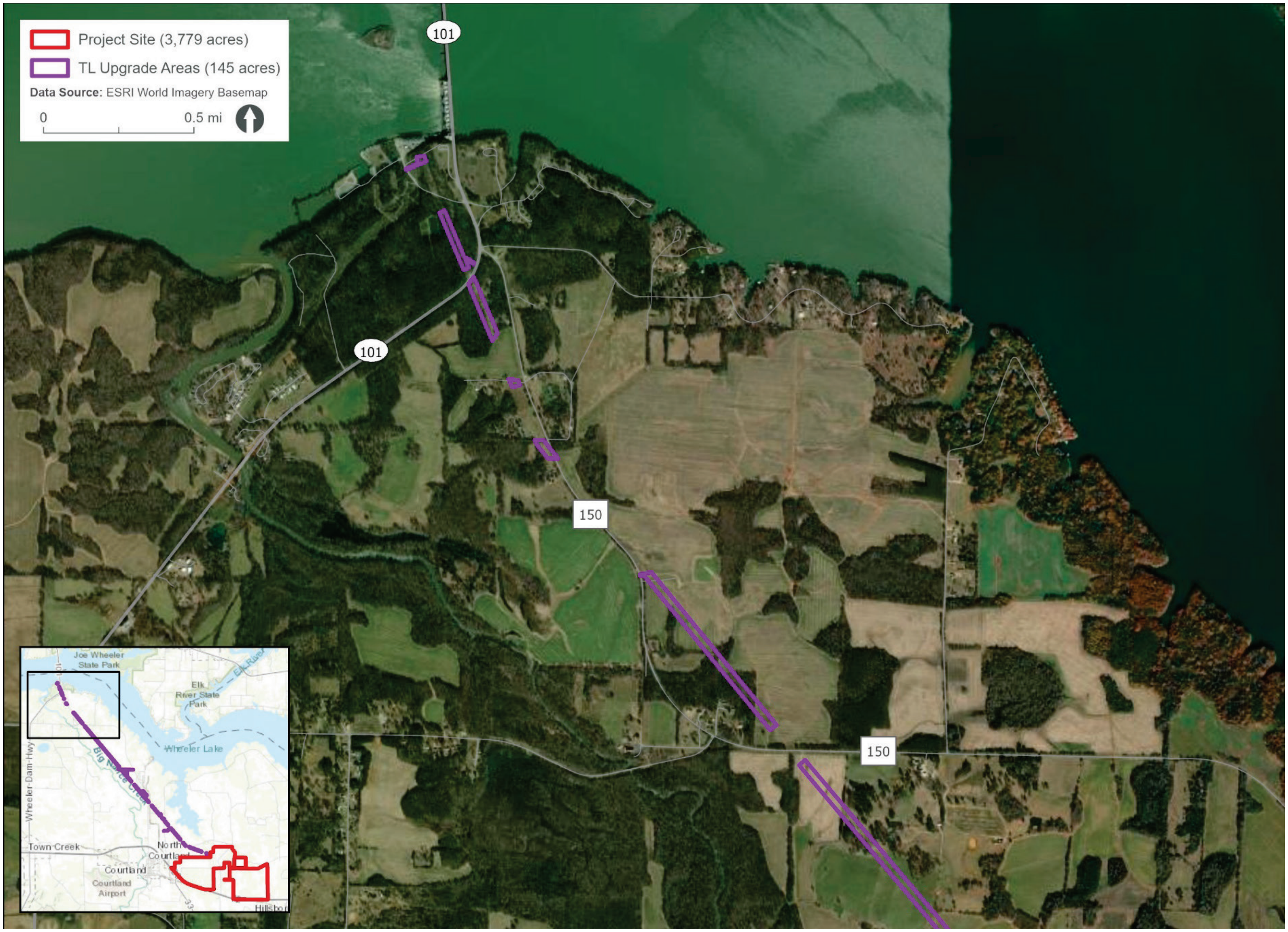

Figure 2-2. Aerial photo showing the northern portion of the TL Upgrade Areas

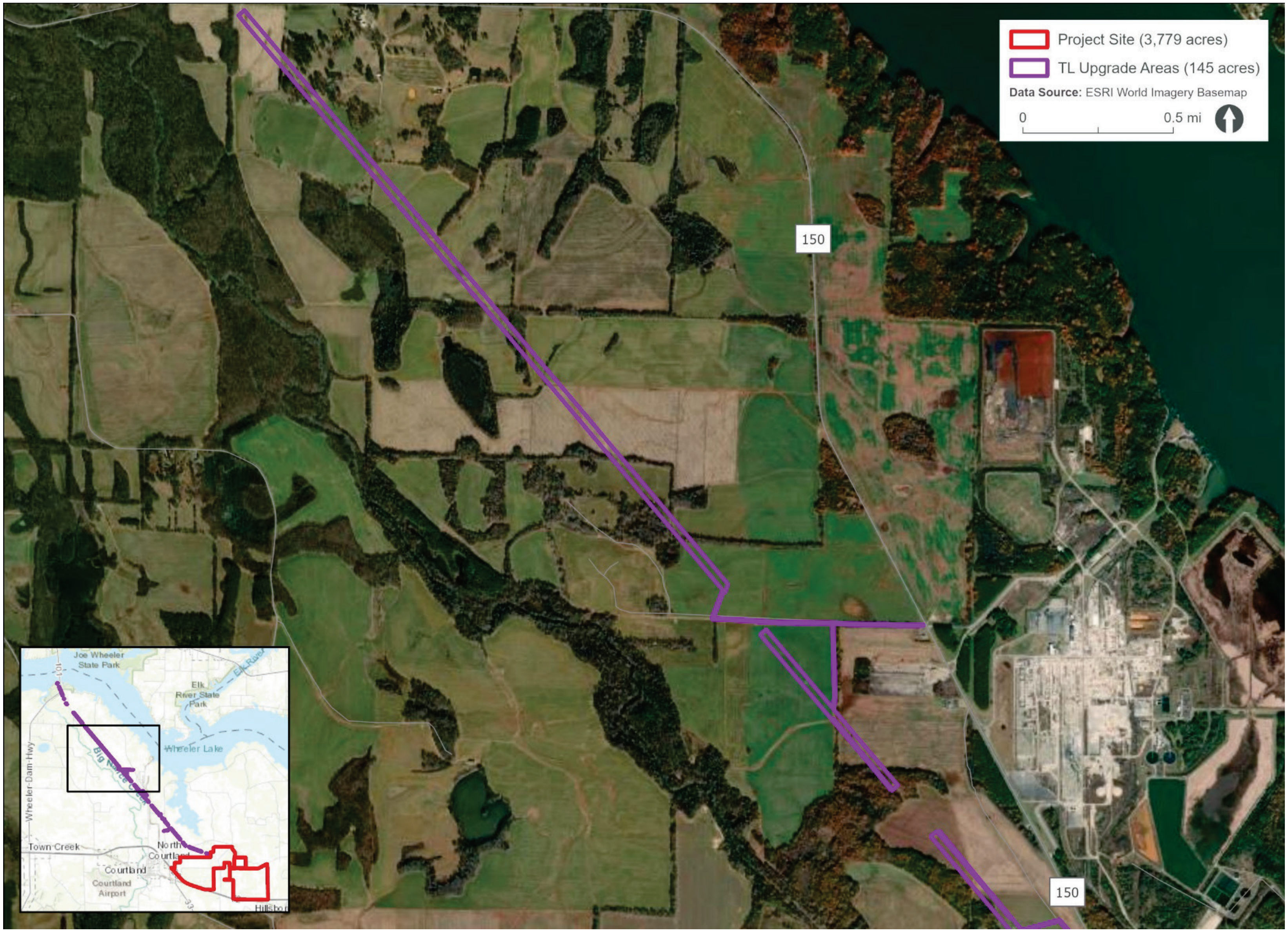

Figure 2-3. Aerial photo showing the central portion of the TL Upgrade Areas

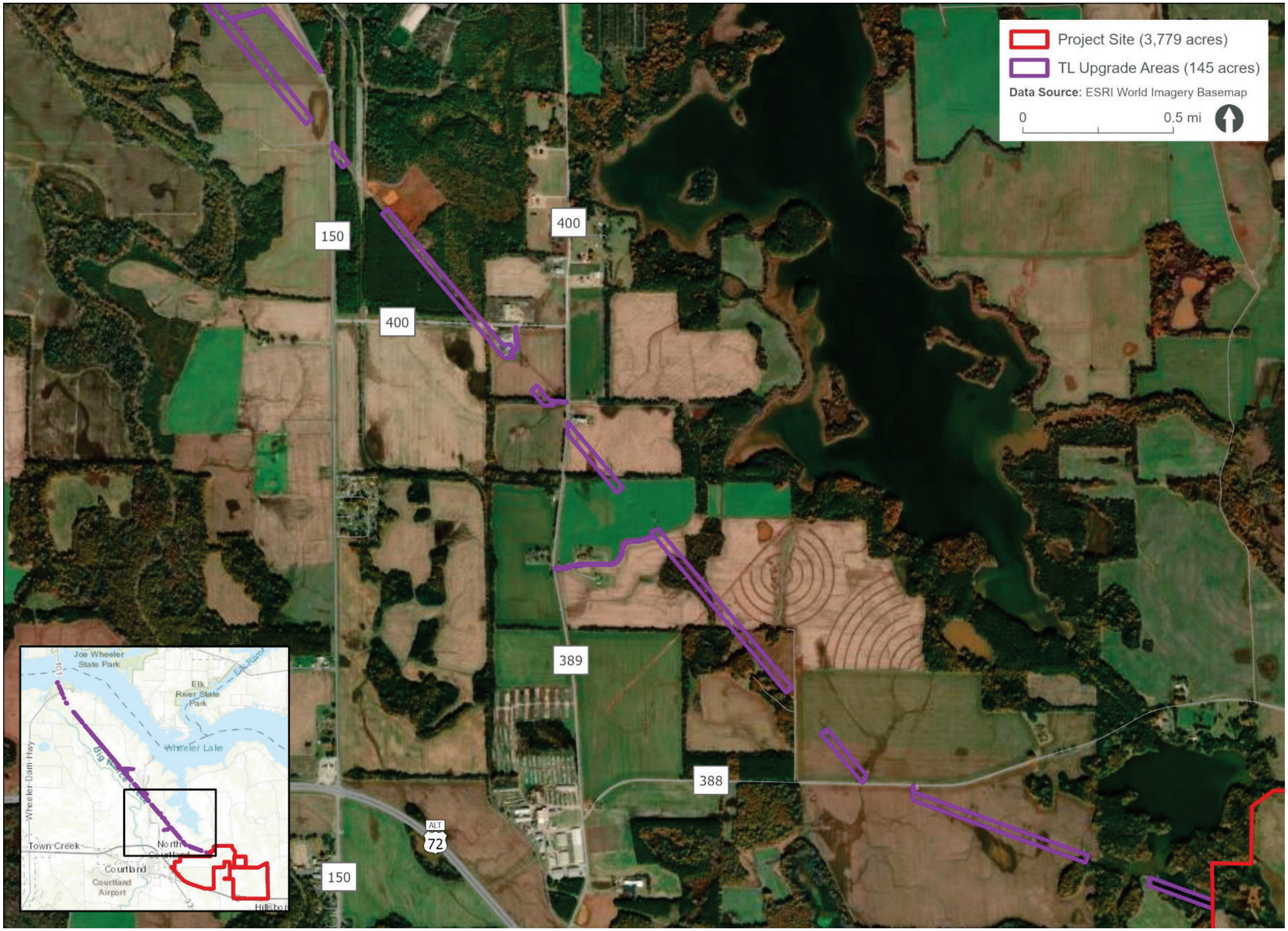

Figure 2-4. Aerial photo showing the southern portion of the TL Upgrade Areas

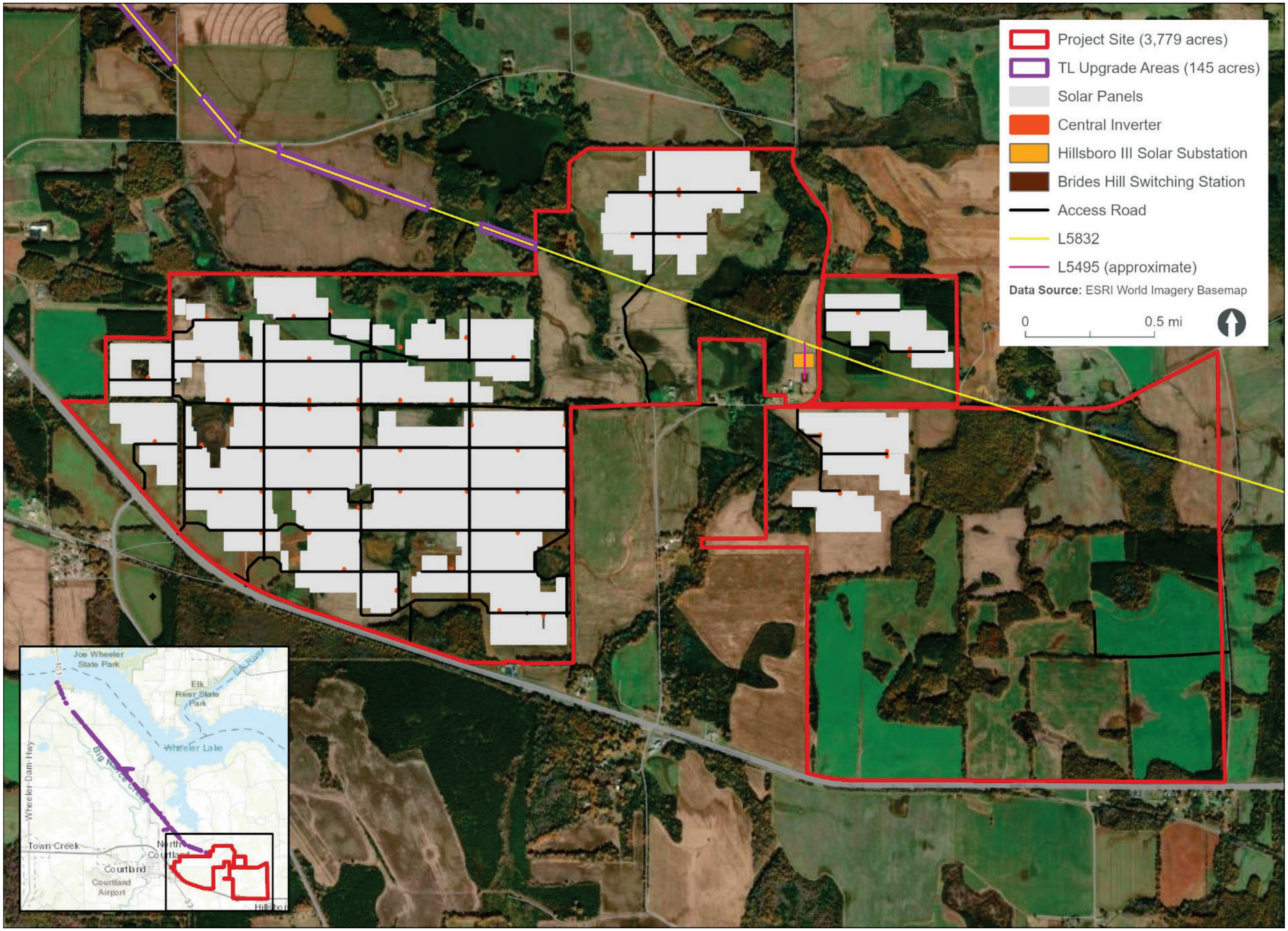

Figure 2-5. Aerial photo showing the proposed layout of the Hillsboro Solar facility components

Figure 2-5 shows the Project Site with the locations of major Project components. Other temporary or permanent components include construction laydown areas, security and communications equipment, and an operations and maintenance building. Also, if determined necessary, the Project would include water wells and a septic system or pump-out septic holding tank.

The PV panels (i.e., modules) would convert sunlight into direct current (DC) electrical energy (Figure 2-6). 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).

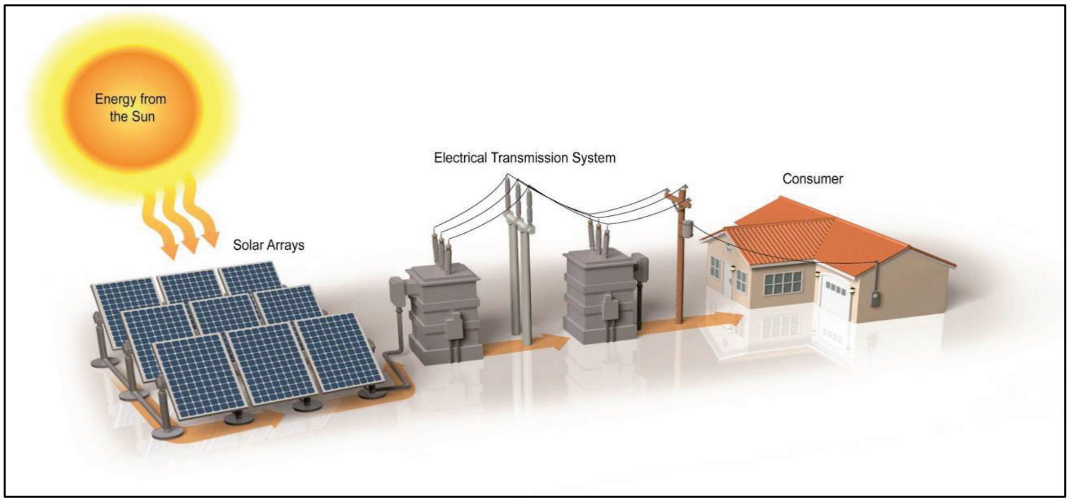

Figure 2-6. General energy flow diagram of PV solar system (not to scale)

The Project would be composed of anti-reflective PV modules mounted together in arrays. Groups of modules would be connected electrically in series to form “strings” of modules, with the maximum string size chosen to ensure that the maximum inverter input voltage is not exceeded by the string voltage at the Project Site’s high design temperature. The modules, approximately 7.5 feet by 4 feet in size, would be in individual blocks consisting of the PV arrays on steel piles and an inverter station on a concrete pad, to convert the DC electricity generated by the modules into AC electricity. Blocks of PV arrays and other facility components would be enclosed by chain-link security fencing. The portions of the Project Site outside the fenced-in areas would not be developed apart from the establishment of 50 acres of species-rich native plant meadows.

The modules would be attached to single-axis trackers that follow the path of the sun from the east to the west across the sky (Figure 2-7). The inverter specification would fully comply with the applicable requirements of the National Electrical Code and Institute of Electrical and Electronics Engineers standards. Each inverter would be collocated with a medium voltage transformer (MVT) that would step-up the AC voltage to minimize the AC cabling electrical losses between the central inverters and the proposed Hillsboro III Solar substation. Underground AC power cables would connect all the MVTs to the main power transformer(s) (MPT) within the Hillsboro III Solar substation. Compacted gravel or dirt access roads up to 16 feet wide would provide access to each inverter block and the Hillsboro III Solar substation.

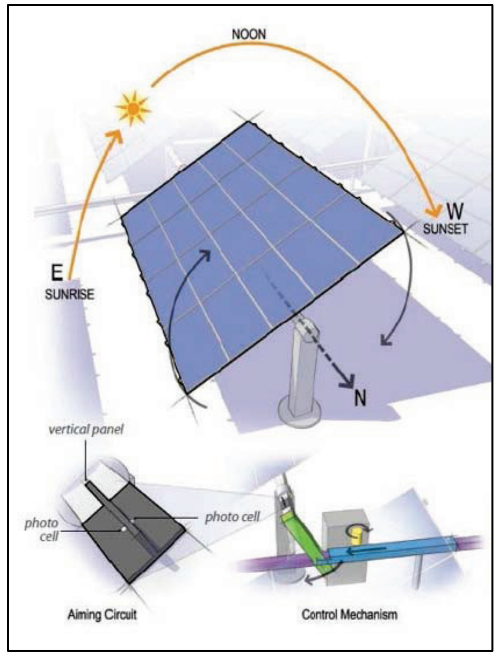

Figure 2-7. Diagram of single-axis tracking system (not to scale)

2.2.2 Construction

As part of NPDES permit authorization (Section 1.5), the site-specific CBMPP would be finalized with the final grading and civil design and would address all construction-related activities prior to construction commencement. The solar facility site would be prepared by surveying, staking, and installing six-foot-tall chain-link security fencing topped with three strands of barbed wire around the eight large blocks of facility components, substation, and switching station. Entrances to the solar facility would be protected by locked, double-swing gates. The Project Site would be accessible only to TVA, Hillsboro Solar, LLC, and their agents and contractors.

Construction assembly areas (laydown areas) would be established for worker assembly, safety briefings, vehicle parking, and material storage during construction. The laydown areas would likely be graveled and would be placed to avoid cultural, biological, and water resources to the greatest extent practicable. Temporary construction trailers for material storage and office space would be parked on-site. In accordance with TVA requirements, minimum 50-foot streamside management zones (SMZs) or avoidance buffers surrounding wetlands and intermittent and perennial streams would be established as impact avoidance measures prior to any clearing, grubbing, grading, or utility line installation activities conducted by the construction contractor (TVA 2022a). Apart from non-mechanical removal of trees and other tall vegetation and leaving the roots in place to prevent shading of the PV panels, these SMZs would be avoided during construction to the greatest extent practicable. Within SMZs, tree and vegetation removal would be conducted using non-mechanical means and the roots would be left in place. The SMZs would be marked and protected by silt fences and sediment traps in strategic drainage areas, and other erosion prevention and sediment control best management practices (BMPs) would be implemented, as detailed in the site-specific CBMPP.

Construction activities would be sequenced to minimize the time that bare soil in disturbed areas is exposed. Construction areas would be cleared of debris and tall vegetation, mowed, and lightly graded, as needed, for construction and placement of the solar modules, gravel access roads, substation, switching station, accompanying electrical components, and other Project components. Vegetation clearing would occur where Project components are planned and, to minimize tree shading, within a 200-foot-wide area surrounding proposed PV panel locations. Clearing of trees and other tall vegetation, outside of SMZs, would be accomplished with chain saws, skidders, bulldozers, tractors, and/or low-ground pressure feller-bunchers. Because the area to be cleared is primarily open agricultural land, minimal vegetative debris would accumulate during site preparation. Any vegetative debris that accumulates on-site would be disposed of by open burning or chipping. If chipping is selected, the chips would be stockpiled in locations outside of the developed solar facility and environmentally sensitive areas and used as erosion-control mulch or disposed of in accordance with appropriate regulations. If burning is selected, only vegetation and untreated wood would be burned in accordance with any local ordinances or burn permits (Section 1.5) and would be avoided on days air quality alerts have been issued, as much as feasible. No burning of other construction debris is anticipated. Construction debris would be recycled or hauled to a nearby disposal site, as discussed in Section 3.12, in accordance with federal, state, and local laws and regulations. Mowing would continue as needed to contain plant growth during construction. Trees would be removed between October 1 and March 14 to minimize direct impacts to protected species.

Hillsboro Solar, LLC would work with the existing landscape (e.g., slope, drainage, utilization of existing roads) where feasible and minimize or eliminate grading work to the greatest extent possible. Grading activities would be performed with earthmoving equipment and would result in a consistent slope. Prior to any major grading, efforts would be made to preserve native topsoil as much as economically feasible. Native topsoil would be removed from the area to be graded and stockpiled on-site, avoiding sensitive resources in accordance with the CBMPP, for redistribution over the disturbed area after the grading is completed. Off-site sediment migration would be minimized by the placement of silt fences around each area of ground disturbance within the Project Site. Other appropriate controls, such as temporary vegetative cover, would be used as needed to minimize exposure of soil and to prevent eroded soil from leaving the work area. To manage stormwater during construction, on-site temporary sedimentation basins, sediment traps, or diversion berms would be constructed within the disturbed area of the Project Site. Any sedimentation basins and traps necessary during construction would comply with ADEM requirements and would be constructed either by impoundment of natural depressions or by excavating the existing soil.

The floors and embankments of the sedimentation basins would be allowed to naturally revegetate or replanted as necessary after construction to provide natural stabilization and minimize subsequent erosion. Sedimentation basins would be transitioned into permanent stormwater features. Once sufficient revegetation cover is achieved, the Project Site would be considered stabilized and temporary construction BMPs would be discontinued and/or removed. Other disturbed areas would be seeded after construction using a mixture of non-invasive grass seeds. The seed mix would be selected by guidance established by the local Natural Resources Conservation Service office.

If conditions require, soil may be further stabilized by mulch or sprayable fiber mat. Hydroseeding may be employed as an alternative measure for areas with steep slopes. Where required, hay mulch would be applied at three tons per acre and distributed over the area. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas is stable.

Hillsboro Solar, LLC would also establish and manage up to 50 acres of the Project Site as species-rich native plant meadows. These areas would be in long, narrow strips surrounding or adjacent to the solar arrays, mostly on the perimeter of the Project Site. No forested land would be cleared to create the meadow zones. In areas that are currently in agricultural production, restoration sites would likely be seeded with native grasses and wildflowers using a seed drill or planter. Broadcast seeding methods would likely be employed in recently harvested areas. Sites would be maintained with a combination of annual winter mowing, periodic selective application of herbicide to woody species, and prescribed fire where appropriately distant from solar arrays and other project components. Meadow establishment in recently timbered areas would rely on prescribed fire to encourage native wildflowers and grasses. Seeding and selective use of herbicide in these fire-managed areas could be used to increase species diversity and control non-native weeds, respectively.

During construction, water would be used as needed for soil compaction and dust control and for sewer treatment, if determined necessary. Water in sufficient quantity and quality would be provided by new on-site wells and/or by delivery via water trucks. If selected, wells would be located to provide access for construction water and to reduce the potential for any substantial groundwater level drawdown. Groundwater yield in the vicinity of the Project Site is up to 1,000 gallons per minute (ACES 2021). Based on aquifer characteristics, reported groundwater yield of surrounding wells, and anticipated water use for construction activities, substantial groundwater level drawdown is not anticipated. If water quality is unsuitable for potable use without disinfection at a minimum, a potable water treatment system would be installed. If needed, Hillsboro Solar, LLC would perform initial groundwater drilling and testing to gather information on aquifer characteristics and develop a plan for the well design. Wells would be constructed using conventional well drilling techniques. A truck-mounted drilling rig would set up at the identified location(s). If necessary, gravel would be used to temporarily stabilize the surface at these location(s). Water-based drilling muds would be collected and dewatered, with runoff occurring locally into nearby field areas. Dewatered muds would be non-toxic and may be spread as subsoil during site grading. If determined necessary, sewer treatment would be accomplished through use of a pump-out septic holding tank.

The single-axis trackers would likely be attached to driven galvanized steel pile foundations, depending on results of the upcoming geotechnical survey. The piles would be driven with a hydraulic ram to a depth typically less than 20 feet. Surface disturbance is typically limited to areas in which the small tractor-sized hydraulic ram machinery operates, including the pile insertion location. Screw piles are another option for PV foundations; these are drilled into the ground with a truck-mounted auger. Screw piles create a similar soil disturbance footprint as driven piles.

The PV modules would be manufactured off-site and shipped to the Project Site ready for installation. The AC collection cables would be installed underground throughout the solar facility in trenches three- to four-feet deep and one- to four-feet wide. The trenches would be backfilled with the excavated soil and then compacted. AC collection cables would be installed by boring beneath jurisdictional streams and wetlands and paved roads and/or as overhead lines mounted on poles. These methods would avoid impacts to jurisdictional waters.

The MPT(s) would be installed on a concrete foundation. An underground or aboveground electrical cable would be installed to connect the MPT to the MVTs through a circuit breaker. As the solar arrays are installed, the balance of the facility, including instrumentation, would continue to be constructed and installed.

Subject to weather, construction activities would take approximately 24–36 months to complete using a crew of up to 500 workers sourced locally to the extent possible. Work would generally occur during daylight hours, Monday through Saturday. Night-time construction could be necessary to make up for schedule deficiencies or to complete critical construction activities and would require temporary lighting.

2.2.3 Electrical Interconnection

The solar facility would connect to the existing adjacent L5832 via the proposed Hillsboro III Solar substation and Bride's Hill switching station. A five-mile portion of L5832 and a seven-mile portion of L5669 would be modified through the replacement of the existing OHGW with new OPGW (Figures 2-2, 2-3, and 2-4). Based on the analyses conducted to date, the transmission system upgrades associated with the interconnection of the solar PV facility to TVA's existing electrical transmission network would include substation and switching station construction; line, structure, and/or access road changes; and other transmission system modifications, as described below.

2.2.3.1 Substation and Switching Station Construction

Hillsboro Solar, LLC and TVA propose to construct the Hillsboro III Solar substation and Bride's Hill switching station, respectively, to connect the solar PV facility to TVA's existing L5832. The Bride's Hill switching station would occupy three acres in the northern portion of the Project Site. Three 161-kV breakers would be installed in a ring bus configuration along with associated metering, communication, and protective equipment. TVA would also install a switch house with station service and telecommunications equipment. The Hillsboro III Solar substation would occupy 0.7 acre just north of the Bride's Hill switching station.

TVA would construct a 600-foot loop line, OPGW-inclusive, into the Bride's Hill switching station from L5832. The loop point would require installation of two S-1AG structures (Structures 58 and 61) near the Bride's Hill switching station and two guyed HS-5G structures (Structures 59 and 60) in the existing ROW. TVA would extend and terminate a new TL (L5495) to a demark dead-end structure. Hillsboro Solar, LLC would continue the OPGW-inclusive TL to the Hillsboro III Solar substation.

The Hillsboro III Solar substation and Bride's Hill switching station location would be fenced and graveled and would have lighting to facilitate night access. Lighting at the proposed substation and switching station would be downward-facing, timer- and/or motion-activated, and low glare to minimize impacts to surrounding areas.

Hillsboro Solar, LLC and TVA would clear vegetation, remove the topsoil, and grade the Hillsboro III Solar substation and Bride's Hill switching station sites. To clear tall vegetation, Hillsboro Solar, LLC would follow the practices outlined in Section 2.2.2, and TVA would follow its *Site Clearing and Grading Specifications* (TVA 2022b). Equipment used could include chain saws, skidders, bulldozers, tractors, and/or low ground-pressure feller-bunchers. As necessary, any woody debris and other vegetation would likely be piled and burned, chipped, or taken off-site. If burning is selected, only vegetation and untreated wood would be burned. Hillsboro Solar, LLC and TVA would obtain any necessary permits for the substation and switching station, respectively. In some instances, vegetation may be windrowed along the edge of the construction site to serve as sediment barriers. Trees would be removed between October 1 and March 14 to minimize direct impacts to protected species.

Hillsboro Solar, LLC would follow the grading practices outlined in Section 2.2.2 for the Hillsboro III Solar substation site. TVA would follow the *Site Clearing and Grading Specifications* (TVA 2022b) for the Bride's Hill switching station, which would be leveled by a cut-and-fill process to achieve final design grade. The areas of the switching station site that are too high (sloped) would be "cut" down to a level elevation, and other areas that are too low require "fill" to raise the elevation. Any additional fill required would be obtained from an approved/permitted borrow area. Once the switching station site has been graded, excess soil (i.e., "spoil") would be removed in preparation for construction of concrete foundations for switching station and substation components. Temporary spoil storage is proposed to be located on-site. Silt fences and site drainage structures would be installed during construction in accordance with the Project-specific CBMPP.

Following clearing, grading, and construction, disturbed areas on the Hillsboro III Solar substation and Bride's Hill switching station sites (excluding the area within the fencing) would be restored to approximate pre-construction conditions, to the extent practicable, utilizing appropriate seed mixtures as described in Section 2.2.2 and TVA's BMP manual, respectively. Erosion controls would remain in place for each phase until that portion of the Project is stabilized in accordance with the Project-specific CBMPP.

2.2.3.2 Transmission Line Upgrades
TVA would install approximately five and seven miles of OPGW on L5832 and L5669, respectively. Most of the TL upgrades would occur within 145 acres of the existing ROW and access roads outside of the Project Site (TL Upgrade Areas). The remaining TL upgrades occur within the Project Site (Figure 2-8). OPGW installation on L5832 would require installation of two new ground wire poles and modifications (e.g., splice cases, strains plates, suspension arms, guys) to several existing TL structures. OPGW installation on L5669 would require replacement of one TL structure, installation of two new ground wire poles, and modifications (e.g., splice cases, strains plates, suspension arms, guys) to several existing TL structures. Table 2-1 provides a summary of the TL upgrades. Installation of OPGW would be performed either using ground equipment or by helicopter. A lineman would work from structure to structure unclipping the existing OHGW and installing a pulley. Reels of conductor and ground wire would be delivered to the construction assembly area established for the TL upgrades. Access to the structures would be via existing roads. A small rope would be pulled from structure to structure. The rope would be connected to the conductor and ground wire and used to pull these down the line through pulleys suspended from the insulators. A bulldozer and specialized tensioning equipment would be used to pull conductors and ground wires to the proper tension. Crews would then clamp the wires to the insulators and remove the pulleys.

Table 2-1. TL Upgrades

TL Structure Upgrade Type	Number of Structures Receiving Upgrade
New TL Structure	4
Replace TL Structure	1
Reconductor	62
Install Splice Case	2
Install GW Strain Plate	2
Install Underbuild Attachment	2
Add Conductor Reinforcement	1
Add Tower Extension	1
Install New Dead-End Demarcation	1
Install New Jumper for Circuit Tie	1
Retire Wave Trap	1

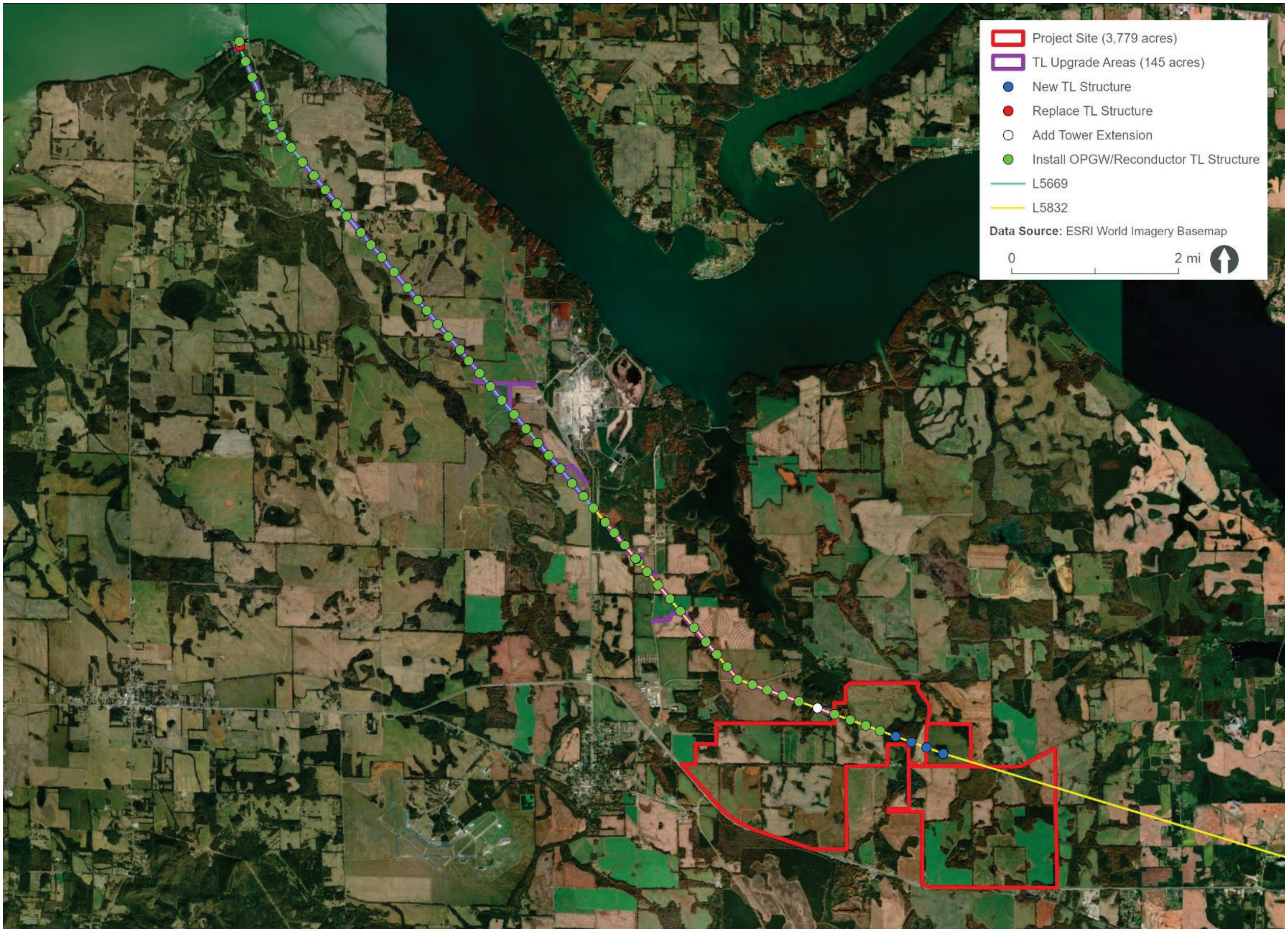

Figure 2-8. Proposed TL upgrades along L5669 and L5832

New poles would be augured into the ground to a depth equal to 10 percent of the pole's length plus an additional two feet, typically about 10 to 12 feet deep. Installation of the new poles would require blasting where bedrock is within the depth necessary to imbed the poles. Normally, the holes would be backfilled with the excavated material, but in some cases, gravel or a concrete-and-gravel mixture would be used, depending on local soil conditions. Equipment used during the construction phase would include trucks, truck-mounted augers, drills, and excavators, as well as tracked cranes and bulldozers. Low ground-pressure-type equipment would be used in specified locations, such as areas with soft ground, to reduce the potential for environmental impacts per TVA BMPs (TVA 2022a).

Network upgrades may require improvements to existing access roads to allow vehicular access to each structure and other points along the existing TLs. Typically, new permanent or temporary access roads used for TLs are located on the TL ROW wherever possible and are designed and located to avoid severe slope conditions and to minimize impacts to environmental resources such as streams. TL access roads are typically about 12- to 16-feet wide and are surfaced with dirt, mulch, or gravel.

With the appropriate permits as described in Table 1-2, culverts and other drainage devices, fences, and gates would be installed as necessary for the TL upgrades. Culverts installed in any perennial or intermittent streams would be removed following construction. In ephemeral streams, the culverts would be either left or removed, depending on the wishes of the landowner or any permit conditions that might apply. Additional applicable environmental quality protection specifications are provided on TVA's transmission website (TVA 2024b).

After the solar facility is constructed and the TL upgrades are complete, electrical service would be tested, motors would be checked, and control logic would be verified. Once the individual systems have been tested, integrated testing of the Project would occur.

2.2.4 Operations

During operation of the solar facility, no major physical disturbance would occur. 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 maximizes the collection of solar energy by rotating with the sun and is barely perceptible. In the late afternoon, module rotation would start to move from west-to-east in a similar slow motion to minimize row-to-row shading. At sunset, the modules would track to a flat or angled stow position.

Except for fence repair, vegetation management, and periodic array inspection, repairs, and maintenance, Hillsboro Solar would have relatively little human activity during operation. During operations, Hillsboro Solar would require small groups of workers to be on-site occasionally to manage the facility and conduct regular inspections, maintenance, and repairs, as well as some part-time permanent staff and/or contract employees to manage the land. Inspections would include identifying any physical damage of panels, wiring, central inverters, transformers, and interconnection equipment, and drawing transformer oil samples. Vegetation on developed portions of the Project Site would be maintained to a height of about 12 to 18 inches. USEPA-registered and TVA-approved pesticides, in accordance with TVA BMPs, may be selectively used alongside trimming and mowing to maintain vegetation and limit invasive species. Trees and other tall vegetation near the solar arrays would be managed to prevent shading of the PV panels. Currently undeveloped areas presently used as agricultural fields would remain undeveloped and would not be actively managed.

During operation of the solar facility, water would be made available via on-site wells for the operation and maintenance building and either on-site wells or by delivery via water trucks for module washing. Precipitation in the region is typically adequate to remove dust and other debris from the PV modules while maintaining energy production. If necessary, module washing would occur on an as-needed basis depending on energy production and amount of precipitation and would comply with proper BMPs to prevent as much soil erosion and/or stream and wetland sedimentation as possible (TVA 2022a). Module washing would likely not produce a discharge waste stream.

The proposed solar facility would be monitored remotely to identify any security or operational issues. If a problem is discovered during non-working hours, a local repair crew or law enforcement personnel would be contacted if an immediate response were warranted.

2.2.5 Decommissioning and Reclamation

Hillsboro Solar, LLC would operate the Project and sell power to TVA under the terms of a 20-year PPA. At the end of the 20-year PPA, Hillsboro Solar, LLC would assess whether to cease operations at the solar facility or to replace equipment, if needed, and attempt to enter into a new PPA with TVA or make some other arrangement to sell the power.

When operations cease, the facility would be decommissioned and dismantled, and the Project Site would be restored per Project decommissioning requirements. The decommissioning process would be coordinated with Lawrence County. Decommissioning actions would include the removal of aboveground and below-ground components to a depth of at least three feet. Decommissioning could take several months; therefore, access roads, security fencing, and electrical power would remain in place for use by the decommissioning and restoration workers until no longer needed. Most of the decommissioned equipment and materials would be recycled through a solar panel recycling service. Materials that cannot be recycled would be disposed of at an approved facility in accordance with federal, state, and local laws and regulations. Other wastes, including batteries, would be disposed of off-site and/or recycled in accordance with manufacturer recommendations and appropriate regulations and industry BMPs. Overall, the Project Site would be returned to a tillable state and revegetated.

2.3 Alternatives Eliminated from Further Consideration

In determining the suitability for development of a site within TVA's service area that would meet customer needs and the goals of expanding TVA's renewable energy portfolio, multiple factors were considered. This process involved screening potential locations and ultimately eliminating those sites that did not have the needed attributes. This process of review and refinement ultimately led to the consideration of the current proposed Project Site.

The site screening process involves several iterations beginning with the general solar resource (the amount of insolation) and the availability of nearby appropriately sized electric infrastructure for interconnection with sufficient available transmission capacity for the proposed solar facility. This is followed by screening for suitable large scale landscape features that would allow utility-scale solar development including:

- Generally flat landscape with minimal slope, with preference given to disturbed contiguous land with no on-site infrastructure or existing tall infrastructure in the immediate vicinity;
- Land having sound geology for construction suitability, with minimal and/or avoidable floodplains or large forested or wetland areas;
- Large contiguous parcels of land with compatible local zoning and located away from densely populated areas; and
- Ability to avoid and/or minimize impacts to known sensitive biological, visual, and cultural resources.

In addition, as part of the proposal/project selection process, TVA considers multiple factors before selecting to pursue a PPA such as cost, schedule, developer's experience, environmental and cultural resources, transmission, and economic development. As a result of this screening process, the current Project in Lawrence County was selected for potential solar development.

2.4 Comparison of Alternatives

Impacts evaluated may be beneficial or adverse and may apply to the full range of natural, aesthetic, historic, cultural, and socioeconomic resources within the Project Site and TL Upgrade Areas of each alternative and within the surrounding areas. Impact severity is dependent upon their relative magnitude and intensity and resource sensitivity. In this document, four descriptors are used to characterize the level of impacts in a manner that is consistent with TVA's current practice.

In order of degree of impact, the descriptors are as follows:

- No Impact (or "absent") – Resource not present or, if present, not affected by Project alternatives under consideration.
- Minor – Environmental effects are not detectable or are so minor that they would not noticeably alter any important attribute of the resource.
- Moderate – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
- Large – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

A comparison of the environmental consequences associated with each alternative is presented in Table 2-2.

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

Resource Area	No Action Alternative	Proposed Action Alternative
Land Use	No direct or indirect Project-related impacts. No impacts if existing land use remained primarily agricultural land.	Minor, temporary direct impacts during construction. Minor, long-term direct impacts during operation due to land use change from agricultural to solar and from agricultural to shrub/scrub, forest, and species-rich native plant meadows in the undeveloped portions of the Project Site.
Geology	No direct or indirect Project-related impacts. Minor impacts if the current land use practices changed or proper BMPs were not followed.	Minor direct impacts resulting from implementation of on-site sedimentation basins and utilization of existing terrain with minor excavation. Mitigation measures would be utilized in sinkhole areas to reduce the risk of geologic hazards and impacts during construction.
Soils	No direct or indirect Project-related impacts. Minor impacts if the current land use practices changed or proper BMPs were not followed.	Minor direct impacts resulting from minor increases in erosion and sedimentation during construction and operation. Minor beneficial impacts to soil health during operation due to the maintenance of permanent vegetative cover.
Prime Farmland	No direct or indirect Project-related impacts. Minor impacts if agricultural practices continued and proper conservation practices were not followed.	Moderate direct impacts from removal of approximately 1,309 acres of prime farmland and 151 acres of farmland of statewide importance within the developed portion of the Project Site and removal of approximately 1,386 acres of farmland in the undeveloped portions of the Project Site from row cropping for the duration of the Project. However, following decommissioning, the Project Site could be returned to agricultural use with little reduction in soil productivity or long-term impacts to prime farmland.
Groundwater	No direct or indirect Project-related impacts. Minor indirect impacts if agricultural practices continued and if the local aquifers were recharged from runoff containing chemical fertilizers and pesticides.	No direct adverse impacts anticipated. Minor indirect beneficial impacts to groundwater due to reduction in fertilizer and pesticide use and maintenance of permanent vegetative cover.
Surface Water	No direct or indirect Project-related impacts. Minor indirect impacts if agricultural practices continued and were not accomplished with proper BMPs.	Minor indirect impacts could occur from stormwater runoff during construction with use of BMPs. Permanent adverse impacts to 1,349 linear feet (LF) of four wet weather conveyances (WWCs) would occur due to the installation of solar arrays and three access road crossings. Permanent impacts to 1.62 acre of five forested wetlands due to tree removal and conversion from forested to herbaceous would occur to prevent solar panel shading. Minor indirect beneficial impacts to surface water due to reduction in fertilizer and pesticide use and maintenance of permanent vegetative cover.
Floodplains	No direct or indirect Project-related impacts. Impacts associated with current land uses would continue.	No direct Project-related impacts on floodplains.

Resource Area	No Action Alternative	Proposed Action Alternative
Water Quality	No direct or indirect Project-related impacts. Minor indirect impacts if agricultural practices continued and were not accomplished with proper BMPs.	Minor impacts to water quality could occur from minor increases in erosion, sedimentation, and stormwater runoff during construction and operation that would be minimized with use of BMPs.
Vegetation	No direct or indirect Project-related impacts.	Minor, long-term direct impacts from conversion of 1,323 acres of row crops within the developed portion of the Project Site to permanent grass and herbaceous cover. Minor to moderate permanent direct adverse impacts for clearing of up to 95 acres of forested land and additional tall vegetation. Moderate direct beneficial impacts as 1,386 acres of undeveloped agricultural land eventually becomes forested and the establishment and maintenance of 50 acres of species-rich native plant meadows.
Wildlife	No direct or indirect Project-related impacts.	Minimal to negligible direct and indirect adverse impacts to common wildlife due to the large amount of already disturbed habitat and the amount of similarly suitable habitat in areas immediately adjacent to the Project Site. Minor adverse impacts to populations of migratory bird species of concern. Minor to moderate long-term beneficial impacts to wildlife by the establishment and maintenance of 50 acres of species-rich native plant meadows and the eventual reversion of 1,386 acres of cropland to forest.
Aquatic Life	No direct or indirect Project-related impacts.	Minor impacts from minor increases in erosion and sedimentation during construction and operation. The use of BMPs would reduce the risk of soil erosion and pesticide runoff into streams. Aquatic species in watercourses that intersect access roads have the potential to be impacted from surface water runoff increasing siltation to those receiving waters. Ground disturbance would be minimized, and all work would be conducted in accordance with BMPs outlined in TVA's BMP manual.
Threatened and Endangered Species	No direct or indirect Project-related impacts.	Implementation of the Proposed Action, with avoidance areas and seasonal restrictions on suitable bat habitat removal, is not likely to adversely affect federally and state-listed species of conservation concern, including federally listed bat species that potentially occur in the Project Site or TL Upgrade Areas, and would result in minor to minimal impacts to state-listed species of conservation concern. Federally listed bat species may be affected due to removal of up to 76 acres of summer roosting and foraging habitat made up of forested and herbaceous vegetation communities. Minimal to negligible impacts anticipated due to habitat loss for the eastern spotted skunk, coal skink, federally or state listed aquatic species of conservation concern, federally or state listed plant species of conservation concern, and federally or state listed insect and arachnid species of conservation concern. Habitat for other listed species is not present, thus no impact is expected. In compliance with ESA Section 7, TVA will consult with USFWS.
Natural Areas, Parks, and Recreation	No direct or indirect Project-related impacts.	Minor, temporary adverse impacts to Roy Coffee ballpark users during construction of the Project and to Joe Wheeler State Park, Wheeler Reservoir, and Wilson Reservoir visitors during the installation of TL OPGW by helicopter. Any road closures necessary for TL upgrade activities would be brief and would not restrict access to recreation areas.

Resource Area	No Action Alternative	Proposed Action Alternative
Visual Resources	No direct or indirect Project-related impacts. Minor impacts if current land use practices continue.	Minor, temporary impacts on visual resources due to altering the visual character of the Project Site and surrounding area and increased activity during construction. Minor to moderate, temporary impacts on visual resources in the vicinity of the TL Upgrade Areas during installation of OPGW, modifications to the existing TLs, and other equipment associated with the TL upgrade activities. During operations, moderate, long-term adverse impacts due to altering the scenic attractiveness rating from typical or common to indistinctive and the scenic integrity rating from moderate to high to low to moderate. During operations, moderate direct impacts in the immediate vicinity due to the visibility of relatively large portions of the Project elements; minor direct impacts on a larger scale, due to variation of the visual attributes of the Project Site as distance from the Project increases.
Noise	No direct or indirect Project-related impacts.	Moderate, temporary impacts to the ambient noise environment in the Project Site and surrounding area would occur during construction. Minimal to negligible impacts during operation and maintenance. Temporary, moderate impacts to the ambient noise environment in the TL Upgrade Areas due to OPGW installation by helicopter.
Air Quality and Greenhouse Gas (GHG) Emissions	No direct or indirect Project-related impacts. Minor impacts if current land use practices continue.	Minor direct adverse impacts to air quality during construction of the Project. Minimal to negligible adverse impacts to average temperatures and annual precipitation runoff amounts of the developed area. Negligible adverse impacts from GHG emissions during construction. Long-term beneficial impacts due to the nearly emissions-free solar generation, offsetting the need for power that would otherwise likely be generated by the combustion of fossil fuels.
Cultural Resources	No direct or indirect Project-related impacts. Minor impacts if current land use practices continue.	Visual and physical adverse impacts to the Wheeler Station Rural Historic District (WSRHD) that would be minimized through appropriate mitigation included in the previously executed memorandum of agreement (MOA) between TVA and AHC. No adverse visual impacts to the railroad segment associated with the Deas and Whiteley detachments of the Cherokee Trail of Tears or to the American Store. No adverse visual and physical impacts to Bride’s Hill or to the NRHP-listed Wheeler Hydroelectric Project. With avoidance of the 33 sites of undetermined eligibility status and the three cemeteries during the life of the Project, per an agreement between TVA and Urban Grid, the Project would not adversely affect these historic properties.
Utilities	No direct or indirect Project-related impacts. Minor impacts if current land use practices continue.	Potential minor, short-term adverse impacts to local utilities (electricity and telecommunication connections) when bringing the solar facility on-line, conducting TL upgrade activities, or during routine maintenance of the facility. Minor, long-term beneficial impacts to electrical services across the region due to additional renewable energy resources.

Resource Area	No Action Alternative	Proposed Action Alternative
Waste Management	No direct or indirect Project-related impacts. Minor impacts if current land use practices continue.	Minor, temporary impacts during construction due to on-site storage and use of petroleum-based oils, fuels, and general construction waste.
Public and Occupational Health and Safety	No direct or indirect Project-related impacts. Minor impacts if current land use practices continue.	Minor, temporary impacts during construction that would be minimized with adherence to Occupational Safety and Health Act (OSHA) regulations and health and safety plans.
Transportation	No direct or indirect Project-related impacts.	Minor, temporary direct impacts to transportation during construction would be minimized through appropriate mitigation.
Socioeconomics	No direct or indirect Project-related impacts.	Minor, short-term direct beneficial economic impacts would result from construction, including the purchase of materials, equipment, and services and a temporary increase in employment, income, and population. Long-term beneficial direct impacts to economics and population in Lawrence County from Project operations.
Environmental Justice (EJ)	No direct or indirect Project-related impacts on minority or low-income populations.	Minor, temporary impacts to communities with EJ concerns.

2.5 Best Management Practices and Mitigation Measures

Hillsboro Solar, LLC and TVA would implement minimization and mitigation measures in relation to resources potentially affected by the construction and operation of the Project. These include standard BMPs and permit requirements, as well as Project-specific measures. These practices and measures are summarized in this section.

2.5.1 Standard Practices and Routine Measures

2.5.1.1 Geology and Paleontology

- Should paleontological resources be exposed during site construction or operation activities, a paleontological expert would be consulted to evaluate the nature of the paleontological resources, recover these resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy.

2.5.1.2 Soils

- Install silt fences along the perimeter of vegetation-cleared areas.
- Implement other soil stabilization and vegetation management measures to reduce the potential for soil erosion during site operations.
- Balance cut-and-fill quantities to alleviate the transportation of soils off-site during construction.

2.5.1.3 Water Resources

- Comply with the terms of the CBMPP prepared as part of the NPDES permitting process.
- Comply with the terms of USACE Section 401 and 404 permits and associated mitigation, and compensatory mitigation as applicable and/or in alignment with EO 11990, Protection of Wetlands.
- Use BMPs for controlling soil erosion and stormwater runoff, such as the use of 50-foot SMZs surrounding intermittent and perennial streams and wetlands according to categories defined by TVA's *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities, Revision 4* (TVA 2022a): Standard Stream Protection (Category A), Protection of Important Streams, Springs, and Sinkholes (Category B), or Protection of Unique Habitat (Category C).
- Implement other routine BMPs as necessary, such as non-mechanical tree removal within surface water SMZs, placement of silt fences and sediment traps along SMZ edges.
- Use only USEPA-registered and TVA-approved herbicides per label directions designed to restrict applications near receiving waters and to prevent unacceptable aquatic impacts in areas requiring chemical treatment (TVA 2022a).
- Ensure construction and maintenance activities occur during dry periods as much as possible.

2.5.1.4 Floodplains

- Improve access roads within the 100-year floodplains (but not floodways) in such a manner that upstream flood elevations would not be increased by more than one foot.

- If hauled off-site for disposal, dispose of excavated material outside the 100-year floodway.
- When the facility is decommissioned and dismantled, deposit deconstruction debris outside the 100-year floodway.
- Adhere to TVA subclass review criteria for TL upgrade activities in floodplains (TVA 1980).

2.5.1.5 Biological Resources

- Revegetate with non-invasive grasses to enhance habitat, including up to 50 acres of species-rich native plant meadow areas that would promote pollinators on the Project Site; reduce erosion; and limit the spread of invasive species (per EO 13112, Invasive Species).
- Consider any recommendations regarding biological resources and pollinator species made by relevant state and federal partners.
- Use timer- and/or motion-activated downward-facing, fully shielded, and/or low-glare lighting to limit attracting wildlife, particularly migratory birds and bats.
- Use only USEPA-registered and TVA-approved herbicides in accordance with label directions designed in part to restrict applications near receiving waters and to prevent unacceptable aquatic impacts in areas requiring chemical treatment.
- Coordinate with USDA and/or USFWS if active osprey and eagle nests are identified during aerial nest surveys of the TL Upgrade Areas to develop avoidance and minimization measures and ensure compliance under federal law prior to commencement of construction activities.
- As appropriate, implement Avian Power Line Interaction Committee (APLIC) guidelines to minimize impacts to birds during the TL upgrade activities (APLIC and USFWS 2005).
- In areas requiring tree removal, clearing activities would be limited to the winter clearing window, October 1 through March 14, to minimize impacts to wildlife and protected species.

2.5.1.6 Visual Resources

- Use timer- and/or motion-activated downward-facing, fully shielded, and/or low-glare lighting to limit visual effects at night.

2.5.1.7 Noise

- Limit construction activities primarily to daytime hours and ensure that heavy equipment, machinery, and vehicles utilized at the Project Site meet all federal, state, and local noise requirements.
- Pile-driving within 5,000 feet of the nearest residences and churches would be scheduled during daylight hours Monday through Friday and occasionally on Saturdays when the schedule requires and outside of church services to minimize impacts to the residences and churches.

2.5.1.8 Air Quality and Climate Change

- Comply with local ordinances or burn permits and avoid burning on days air quality alerts have been issued, as much as feasible, if burning of vegetative debris is required, and use BMPs such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust and maintain equipment in good condition.

2.5.1.9 Cultural Resources

- Adhere to setbacks from certain NRHP-eligible and listed cultural resources, as discussed in Section 3.10, and other avoidance, minimization, and mitigation measures in consultation with AHC and federally recognized tribes.

2.5.1.10 Waste Management

- Develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials.

2.5.1.11 Public and Occupational Health and Safety

- Implement BMPs for site safety management to minimize potential risks to workers.

2.5.1.12 Transportation

- Post a flag person during heavy commute periods, prioritize access for local residents, and implement staggered work shifts during daylight hours to manage construction traffic flow near the Project Site.
- Obtain an ALDOT Turnout Permit and a Lawrence County Driveway Access Permit for Project related driveways or turnouts that provide access to a state highway in use during facility operations.

2.5.2 Non-Routine Mitigation Measures

2.5.2.1 Biological Resources

- Minimize direct impacts to migratory birds and federally listed tree roosting bats by implementing a 600-foot solar facility setback from known bat roost trees.
- Implement up to 50 acres of species-rich native plant meadow areas that would promote pollinators on the Project Site; reduce erosion; and limit the spread of invasive species (per EO 13112, Invasive Species).

2.5.2.2 Visual Resources

- Implement a 300-foot solar facility setback from US 72A/SR 20.

2.6 The Preferred Alternative

TVA's preferred alternative for fulfilling TVA's purpose and need is the Proposed Action Alternative. This alternative would generate renewable energy for TVA and TVA's customers with only minor environmental impacts due to the implementation of BMPs and minimization and mitigation efforts, as described in Section 2.5. Implementation of the Project would help meet TVA's renewable energy goals and would help TVA meet customer-driven energy demands on the TVA system.

2.7 The Environmentally Preferable Alternative

The environmentally preferable alternative is the No Action Alternative. This alternative would result in the lowest level of environmental impacts as the impacts associated with construction and operation of the solar facility would not occur. As shown in Table 2-2, taking no action would result in fewer direct, indirect, and cumulative impacts on the human environment than implementing the Proposed Action. However, the No Action Alternative does not meet the purpose and need for the project. TVA would continue to rely on other sources of generation described in the 2019 IRP to ensure an adequate energy supply and to meet TVA's goals for increased renewable energy generation.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter begins with a description of other actions that are considered in the cumulative analyses. The chapter continues with descriptions of the existing environmental, social, and economic conditions of the Project Site, TL Upgrade Areas, and surrounding areas and the potential environmental effects on those resource areas that could result from implementing the No Action Alternative or Proposed Action Alternative.

3.1 Identification of Other Actions

In addition to the No Action and Proposed Action alternatives identified in Chapter 2, this analysis also considers the past, present, and reasonably foreseeable future actions (RFFAs) listed in Table 3-1. These actions within 10 miles of the Project Site and TL Upgrade Areas were identified as having the potential to, in aggregate, result in larger and potentially adverse effects to the resources of concern. Potential cumulative impacts for resources in which adverse impacts from the proposed Project are anticipated are discussed in each resource section.

Table 3-1. Summary of other past, present, or reasonably foreseeable future actions within a 10-mile radius of the Project Site and TL Upgrade Areas

Action	Description	Distance from Project Site	Distance from TL Upgrade Areas	Project Type
US 72A Resurfacing	Resurfacing of US 72A/SR 20 from County Road (CR) 585 to State Route (SR) 33.	Adjacent	One mile west	Past
Former International Paper Site	An existing 1,806-acre industrial site with rail and barge access available for purchase.	Four miles northwest	Adjacent	Past and RFFA
Mallard Fox West Industrial Park	An existing 1,251-acre industrial park with rail access and 625 acres available for purchase. Existing industries on-site include Jack Daniels Cooperage, Nucor Tubular, and Progressive Pipe Fabricators. Two new industries (CCI Manufacturing and First Solar) are expected to add 28 and 800 new jobs, respectively, to the area by 2025.	Six miles southeast	Eight miles southeast	Past, Present, and RFFA
Rogersville Business Park	An existing 136-acre business park in Rogersville with 83 acres available for purchase.	Nine miles north	Six miles northeast	Past, Present, and RFFA
Rebman 128-Acre Site	A proposed 128-acre industrial site in Courtland.	Adjacent	One mile west	RFFA

Action	Description	Distance from Project Site	Distance from TL Upgrade Areas	Project Type
CR 270 Bridge Replacement	A proposed bridge replacement on Jefferson Street (CR 270) over Norfolk Southern Railroad in Courtland.	Two miles west	Three miles west	RFFA
Industrial Airpark	An existing 2,240-acre industrial park with 800 acres available for purchase adjacent to the Courtland Airport. The Lockheed Martin Hypersonics Production Facility is expected to add 72 new jobs by 2025.	Two miles west	Three miles west	RFFA
US 72A/SR 20 Resurfacing	A proposed resurfacing of US 72A/SR 20 from the Colbert County line to CR 585.	Four miles west	Five miles west	RFFA
Durango Partners Hwy 20 Site	A proposed 16-acre site in Trinity available for purchase.	Eight miles southeast	Nine miles southeast	RFFA
Watermark Business Park	A proposed 17-acre business park in Trinity available for purchase.	Eight miles southeast	Nine miles southeast	RFFA
Hwy 20/Red Hat Rd. Eyster Site	A proposed 31-acre industrial site in Trinity available for purchase.	Eight miles southeast	Nine miles southeast	RFFA
Eyster/Steed Site	A proposed 298-acre industrial site in Trinity available for purchase.	Nine miles southeast	10 miles southeast	RFFA
North Alabama Utility-Scale Solar Facility[1]	A proposed 200-MW AC solar PV facility that would occupy approximately 1,459 acres of a 2,896-acre site in Lawrence County.	Adjacent	Adjacent	RFFA

Sources: Alabama Department of Commerce 2024; ALDOT 2024a; TVA 2022c; TVA Economic Development 2024; Yellowhammer News 2020

[1] TVA completed an EIS in 2022 to address the potential environmental impacts associated with constructing, operating, maintaining, and decommissioning this project (TVA 2022c).

3.2 Land Use

3.2.1 Affected Environment

Land use is defined as the way people use and develop land, including leaving land undeveloped or using land for agricultural, residential, commercial, and industrial purposes.

3.2.1.1 Project Site

The area surrounding the Project Site consists of agricultural, forested, and rural-residential land (Figure 3-23). Consistent with the surrounding area, imagery data collected from the National Land Cover Database (NLCD) show the Project Site as primarily cultivated crops and woody wetlands (Multi-Resolution Land Characteristics Consortium [MRLC] 2021). See

Section 3.5.1.1.1 for additional details of vegetation on the Project Site. The 3,779-acre Project Site generally consists of gently sloping terrain with elevations ranging from approximately 570 to 620 feet above mean sea level. According to historical aerial imagery and topographic quadrangle maps, land use on the Project Site has remained relatively unchanged and dominated by agriculture since at least the early 1950s but likely earlier, based on historical trends (USGS 2024). No parks or other public outdoor recreation facilities occur on the Project Site. The Project Site is within an unincorporated portion of northern Lawrence County, which does not have a land use plan for the unincorporated portions of the county nor are lands subject to zoning restrictions outside the incorporated city of Moulton.

3.2.1.2 TL Upgrade Areas

The area surrounding the TL Upgrade Areas consists of agricultural, forested, and rural-residential land. Consistent with the surrounding area, imagery data collected from the NLCD show the TL Upgrade Areas as primarily cultivated crops and hay/pasture (MRLC 2021). See Section 3.5.1.1.2 for additional details of vegetation on the TL Upgrade Areas. The 145-acre TL Upgrade Areas generally consist of gently sloping terrain with elevations ranging from approximately 550 to 590 feet above mean sea level. According to historical aerial imagery and topographic quadrangle maps, land use on the TL Upgrade Areas has remained relatively unchanged and dominated by agriculture since at least the early 1950s but likely earlier, based on historical trends (USGS 2024). No parks or other public outdoor recreation facilities occur on the TL Upgrade Areas. The TL Upgrade Areas are within an unincorporated portion of northern Lawrence County, which does not have a land use plan for the unincorporated portions of the county nor are lands subject to zoning restrictions outside the incorporated city of Moulton.

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 Project-related impacts to land use would result. Existing land use would likely remain primarily agricultural land for the foreseeable future.

3.2.2.2 Proposed Action Alternative

3.2.2.2.1 Project Site

Under the Proposed Action Alternative, the development of the solar facility would result in the long-term change in land use from primarily agricultural land dominated by cultivated crops to primarily light industrial. NLCD identified 2,714 acres as being used for row crops on the Project Site, however, during field surveys, approximately 72 percent (2,713 acres) of the 3,779-acre Project Site was identified as being used for row crops (Section 3.5.1.1.1). Approximately 43 percent (1,610 acres) of the 3,779-acre Project Site would be developed into the solar facility, removing 1,327 acres of previously delineated cropland from row cropping use during the lifetime of the Project. The remaining 1,386 acres of cropland in the undeveloped portions of the Project Site would also be removed from row cropping use during the lifetime of the Project. Approximately 50 additional acres of the Project Site would be maintained as species-rich native plant meadows. A small portion of the facility site comprising the Hillsboro III Solar substation and Bride's Hill switching station would change to light industrial land use. Because the Project Site is within an unincorporated portion of Lawrence County that does not have a land use plan nor is subject to zoning restrictions, the development of the Project Site as a solar facility is compatible with current land use regulations.

3.2.2.2.2 TL Upgrade Areas
Under the Proposed Action Alternative, the TL upgrades would not change current land uses.

3.2.2.3 Cumulative Impacts
The RFFAs such as the adjacent North Alabama Utility-Scale Solar Facility and development of the industrial parks, would contribute to additional changes in land use from agricultural and forested land to industrial in the area. Lawrence County does not have a land use plan for the unincorporated portions of the county, nor are lands subject to zoning restrictions. The Proposed Action, when considered with the past, present, and RFFAs, would have moderate, cumulative impacts on land use in the area, including the development (and, for the former International Paper site redevelopment) of up to about 5,270 acres for industrial uses representing 1.2 percent of the land area of Lawrence County.

3.3 Geology, Soils, and Prime Farmland

3.3.1 Affected Environment

3.3.1.1 Geology

3.3.1.1.1 Project Site
The Project Site is in the Eastern Highland Rim section of the Interior Low Plateaus physiographic province and is primarily underlain by carbonate bedrock of the Mississippian Period. The Project Site is underlain by bedrock layers of limestone and chert. Well records from the Geological Survey of Alabama (GSA) show bedrock as shallow as 18 feet below ground surface (GSA 2024). In this region, Mississippian-age, calcareous rock types predominate, which results in karst features including springs, sinks, and caves (Griffith et al. 2001).

3.3.1.1.2 TL Upgrade Areas
The TL Upgrade Areas are also in the Eastern Highland Rim section of the Interior Low Plateaus physiographic province and are primarily underlain by carbonate bedrock of the Mississippian Period.

3.3.1.2 Paleontology

3.3.1.2.1 Project Site
Alabama was a shallow, tropical sea during the Paleozoic Era. Erosion and deposition of sediments into the sea created a broad, tropical coastal plain where primitive trees and fern-like plants thrived. These forests are the source of coal deposits across much of northern Alabama. The Permian Period, the last period of the Paleozoic Era, was mainly a time of erosion, and no deposits of this period are known in the state (Paleontology Portal 2024). Fossils in the area are typically in the underlying limestones and consist mainly of Mississippian age oceanic fossils (e.g., corals, brachiopods, crinoids, etc.; Fossil Spot 2008).

3.3.1.2.2 TL Upgrade Areas
The paleontology associated with the TL Upgrade Areas is generally the same as described for the Project Site in Section 3.3.1.2.1.

3.3.1.3 Geological Hazards

3.3.1.3.1 Project Site

Examples of common geological hazards include landslides, volcanoes, earthquakes/seismic activity, and subsidence/sinkholes. Conditions do not exist on the Project Site for most of these types of hazards. The Project Site is on relatively stable ground, with low rolling hills to the south, and the Project Site has no to very low risk of landslides (Ebersole et al. 2011). No volcanoes are present within several hundred miles of the Project Site.

The carbonate bedrock geology and karst landforms in the Project vicinity have a high risk for dissolution, potentially resulting in sinkholes. Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. Land over sinkholes may stay intact until there is not enough support for the land above the open spaces. Then, a sudden collapse of the land surface can occur. Sinkholes can vary greatly in size and shape (USGS 2018b). A desktop review of GSA data depicts 20 sinkholes on the Project Site, primarily on the eastern portion (GSA 2011; Figure 3-1). Although geological field surveys to investigate the presence of these features have not been conducted, other field reconnaissance's activities, including natural resources surveys and geotechnical subsurface explorations, did not identify the presence of karst or sinkholes within the Project Site.

3.3.1.3.2 TL Upgrade Areas

The geological hazards associated with the TL Upgrade Areas are generally the same as described for the Project Site in Section 3.3.1.3.1. Five sinkholes have been mapped on the TL Upgrade Areas, primarily on the central portion (GSA 2011; Figure 3-2, Figure 3-3, and Figure 3-4).

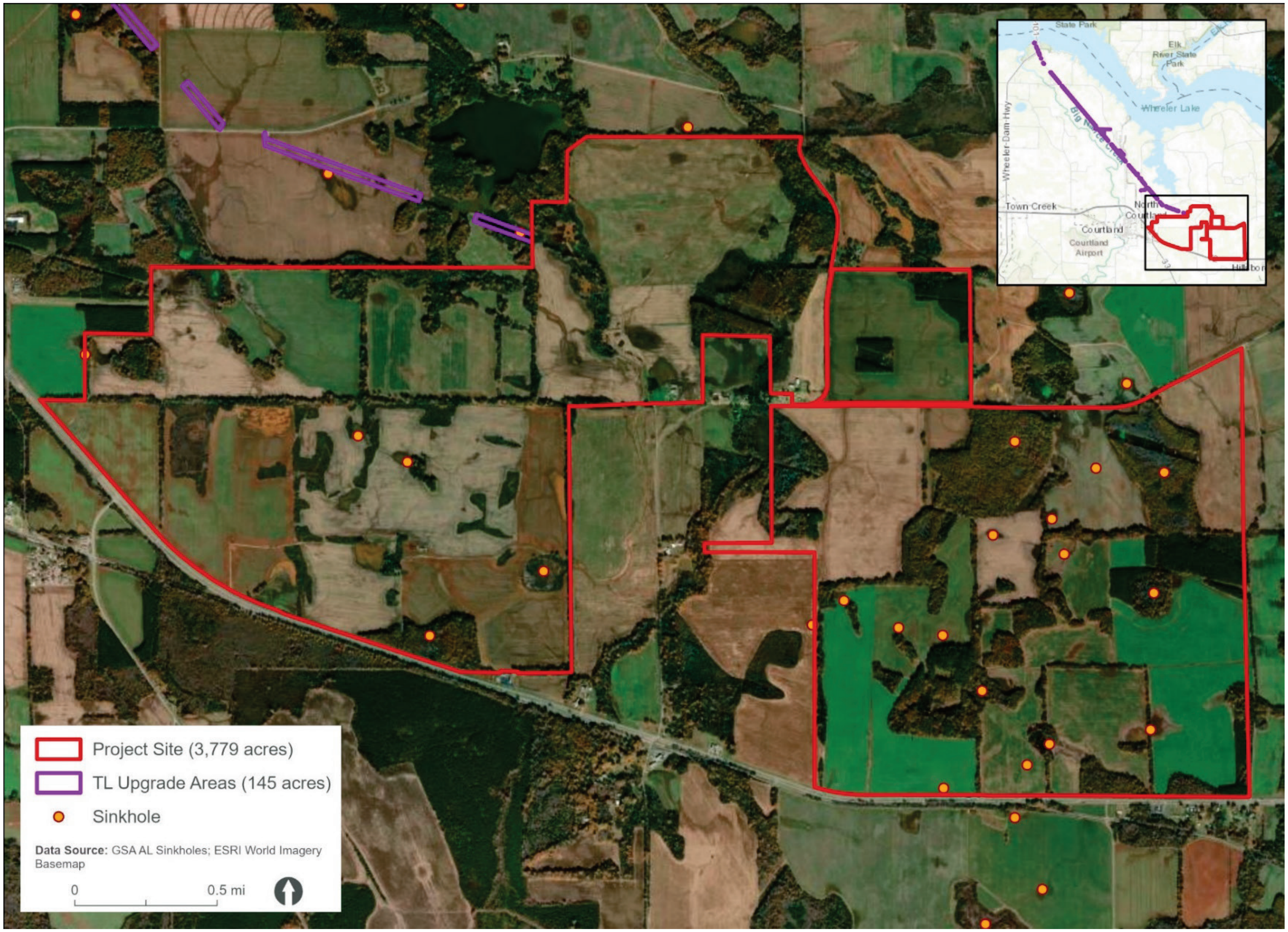

Figure 3-1. Potential sinkholes on and in the vicinity of the Project Site

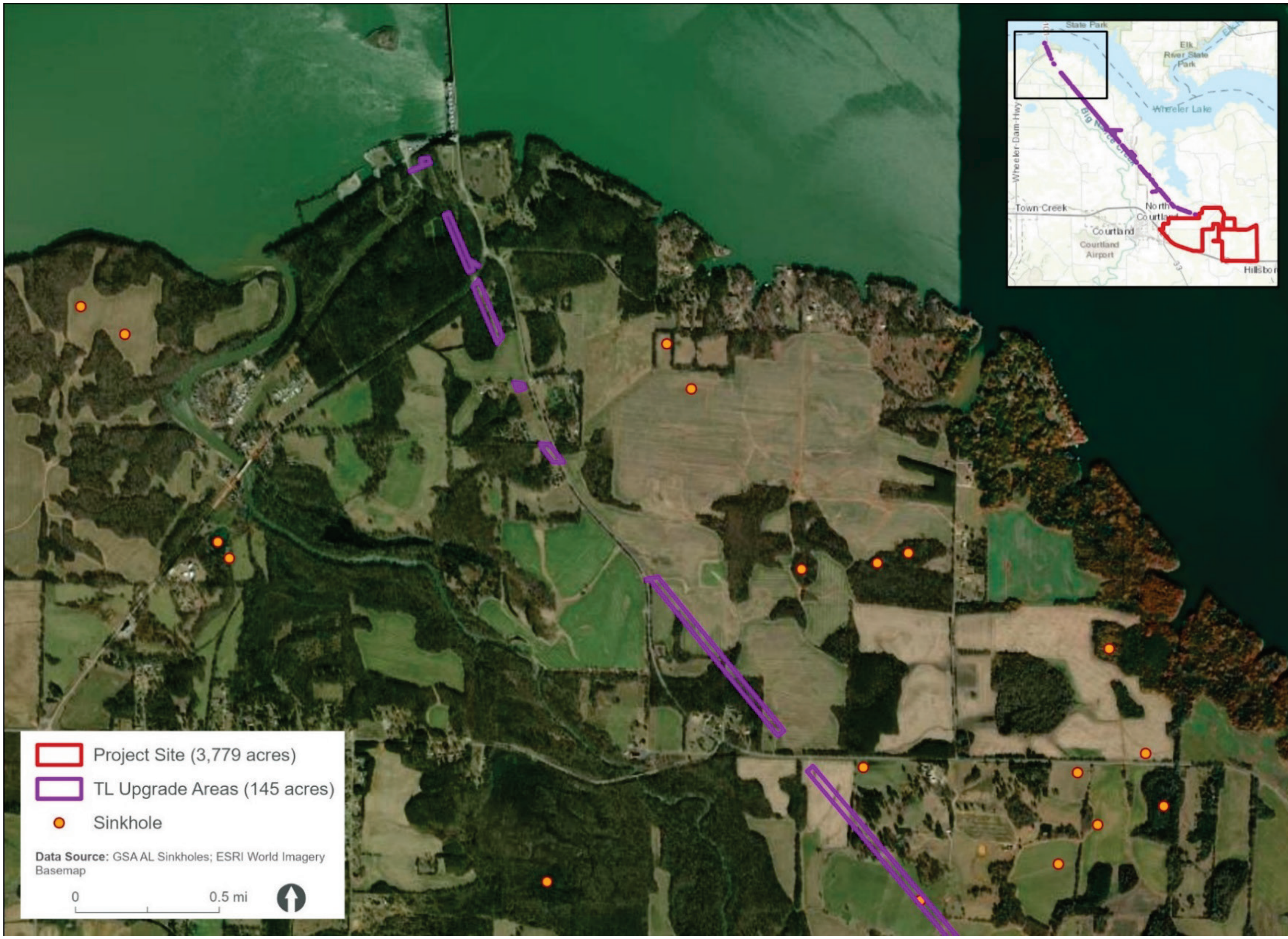

Figure 3-2. Potential sinkholes on and in the vicinity of the northern portion of the TL Upgrade Areas

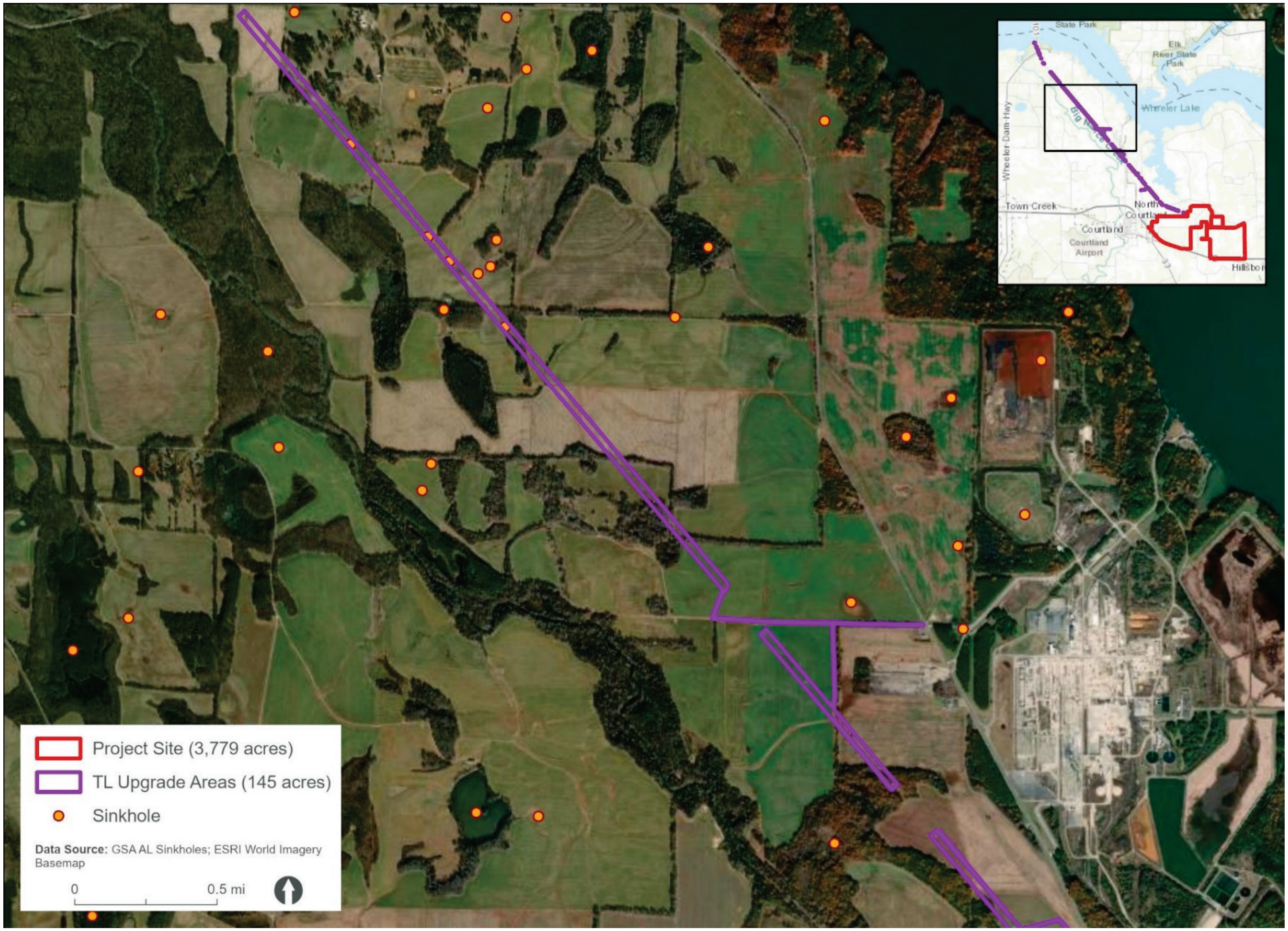

Figure 3-3. Potential sinkholes on and in the vicinity of the central portion of the TL Upgrade Areas

Figure 3-4. Potential sinkholes on and in the vicinity of the southern portion of the TL Upgrade Areas

3.3.1.4 Soils

3.3.1.4.1 Project Site

The Project Site contains 31 soil types. Most of the soils on the Project Site are composed of Decatur silty clay loam, two to six percent slopes, eroded (26.9 percent); Cumberland loam, two to six percent slopes, eroded (16.9 percent); Abernathy-Emory silt loams, zero to two percent slopes (14.2 percent); Robertsville (Ketona) silt loam, zero to two percent slopes, occasionally ponded (9.0 percent); Decatur silty clay, six to 10 percent slopes, severely eroded (8.4 percent); Ooltewah silt loam (5.5 percent); and Decatur silty clay, two to six percent slopes, severely eroded (3.5 percent); with other soil types consisting of less than two percent each (USDA 2023a; Table 3-2; Figure 3-5). Most of the soils on the Project Site are hydric. The Melvin silt loam, Ooltewah fine sandy loam, Ooltewah silt loam, and Robertsville (Ketona) silt loam soils have a hydric rating of 66 to 99 percent, and 15 other soil types have a hydric rating of 1 to 32 percent. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA 2024a).

Table 3-2. Soils on the Project Site

Soil Type	Acreage and % of Project Site	Prime Farmland	Hydric Rating	Drainage Class	Flooding/ Ponding	Parent Material	Landform
Decatur silty clay loam, 2 to 6 percent slopes, eroded (Dc)	1,015.8 (26.9%)	Yes	0	Well drained	No/No	Clayey residuum weathered from limestone	Interfluves on hills
Cumberland loam, 2 to 6 percent slopes, eroded (Cv)	639.1 (16.9%)	Yes	0	Well drained	No/No	Alluvium over residuum weathered from limestone	Ridges on hills
Abernathy-Emory silt loams, 0 to 2 percent slopes (Ac)	536.3 (14.2%)	Yes	0	Well drained	No/ Occasional	Alluvium over residuum weathered from limestone	Drainageways on uplands
Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded (Ra)	338.4 (9.0%)	No[a]	85	Poorly drained	No/ Occasional	Clayey alluvium derived from sedimentary rock	Stream terraces and valleys
Decatur silty clay, 6 to 10 percent slopes, severely eroded (De)	316.0 (8.4%)	No	0	Well drained	No/No	Clayey residuum weathered from limestone	Hillslopes on plateaus
Ooltewah silt loam (Ob)	206.7 (5.5%)	No[a]	90	Somewhat poorly drained	No/ Occasional	Loamy alluvium derived from sedimentary rock	Floodplains
Decatur silty clay, 2 to 6 percent slopes, severely eroded (Df)	134.0 (3.5%)	No[a]	0	Well drained	No/No	Clayey residuum weathered from limestone	Interfluves on hills
Tupelo silt loam (To)	62.3 (1.6%)	No[a]	1	Somewhat poorly drained	No/No	Clayey alluvium derived from sedimentary rock	Stream terraces
Etowah loam, undulating phase (Ee)	58.4 (1.5%)	Yes	1	Well drained	No/No	Alluvium derived from sedimentary rock	Stream terraces
Tyler and Monongahela fine sandy loams, level phases (Mc)	52.7 (1.4%)	Yes	1	Somewhat poorly drained and moderately well drained	No/No	Loamy alluvium derived from sedimentary rock	Stream terraces
Monongahela and Holston fine sandy loams, undulating phase (Hh)	50.4 (1.3%)	Yes	2	Moderately well drained and well drained	No/No	Loamy alluvium derived from limestone, sandstone, and shale	Stream terraces
Lindside silty clay loam (Lb)	49.2 (1.3%)	Yes	1	Somewhat poorly drained	No/No	Loamy alluvium derived from sedimentary rock	Stream terraces

Soil Type	Acreage and % of Project Site	Prime Farmland	Hydric Rating	Drainage Class	Flooding/ Ponding	Parent Material	Landform
Etowah loam, eroded, undulating phase (Ed)	48.0 (1.3%)	Yes	1	Well drained	No/No	Alluvium derived from sedimentary rock	Stream terraces
Baxter (Fullerton) gravelly silt loam, 6 to 12 percent slopes, eroded (Bb)	46.2 (1.2%)	No[a]	0	Well drained	No/No	Residuum weathered from cherty limestone	Ridges on hills
Emory-Abernathy silt loams, 0 to 6 percent slopes (Ad)	44.3 (1.2%)	Yes	0	Well drained	No/No and No/ Occasional	Alluvium over residuum weathered from limestone	Karst depressions and drainageways on uplands
Ooltewah fine sandy loam (Oa)	37.0 (1.0%)	No[a]	90	Somewhat poorly drained	No/ Occasional	Loamy alluvium derived from sedimentary rock	Floodplains
Melvin silt loam (Ma)	26.0 (0.7%)	No	90	Poorly drained	Occasional/ No	Loamy alluvium derived from sedimentary rock	Floodplains
Tyler and Monongahela fine sandy loams, eroded, undulating phase (Mb)	23.9 (0.6%)	Yes	2	Somewhat poorly drained and moderately well drained	No/No	Loamy alluvium derived from sedimentary rock, limestone, sandstone, and shale	Stream terraces
Dewey cherty silty clay loam, eroded, rolling phase (Dg)	23.2 (0.6%)	No[a]	1	Well drained	No/No	Clayey residuum weathered from limestone	Hillslopes
Decatur silty clay, 6 to 12 percent slopes, gullied (Dd)	15.5 (0.4%)	No[a]	0	Well drained	No/No	Residuum weathered from limestone	Interfluves and hills
Monongahela and Holston fine sandy loams, eroded, undulating phase (Hf)	10.7 (0.3%)	Yes	2	Moderately well drained and well drained	No/No	Loamy alluvium derived from limestone, sandstone, and shale	Stream terraces
Cumberland loam, 2 to 6 percent slopes (Cw)	7.6 (0.2%)	Yes	0	Well drained	No/No	Alluvium over residuum weathered from limestone	Ridges on hills
Abernathy-Emory fine sandy loams, 0 to 2 percent slopes (Aa)	6.7 (0.2%)	Yes	0	Well drained	No/ Occasional and No/No	Alluvium over residuum weathered from limestone	Drainageways and uplands
Decatur silty clay loam, 6 to 12 percent slopes, eroded (Db)	6.3 (0.2%)	No[a]	0	Well drained	No/No	Residuum weathered from limestone	Hillslopes and hills
Etowah silt loam, undulating phase (Ef)	6.0 (0.2%)	Yes	1	Well drained	No/No	Alluvium derived from sedimentary rock	Stream terraces

Soil Type	Acreage and % of Project Site	Prime Farmland	Hydric Rating	Drainage Class	Flooding/ Ponding	Parent Material	Landform
Dewey cherty silty clay loam, eroded, undulating phase (Dh)	4.6 (0.1%)	Yes	1	Well drained	No/No	Clayey residuum weathered from limestone	Ridges
Decatur silt loam, 2 to 6 percent slopes (Da)	3.5 (0.1%)	Yes	0	Well drained	No/No	Clayey residuum weathered from limestone	Ridges on hills
Tyler and Monongahela fine sandy loams, undulating phase (Md)	3.0 (0.1%)	Yes	2	Somewhat poorly drained and moderately well drained	No/No	Loamy alluvium derived from sedimentary rock, limestone, sandstone, and shale	Stream terraces
Water (W)	2.8 (0.1%)	No	0	Not applicable	Not applicable	Not applicable	Not applicable
Allen fine sandy loam, eroded, hilly phase (Af)	1.7 (<0.1%)	No	1	Well drained	No/No	Alluvium derived from sandstone and shale	Hillslopes
Tyler fine sandy loam (Tp)	1.5 (<0.1%)	Yes	1	Somewhat poorly drained	No/No	Loamy alluvium derived from sedimentary rock	Stream terraces
Sequatchie fine sandy loam, undulating phase (Sb)	1.3 (<0.1%)	Yes	1	Well drained	No/No	Loamy alluvium derived from sedimentary rock	Stream terraces
Total Prime Farmland	**2,563.1 (67.8%)**						
Total Farmland of Statewide Importance	**869.9 (23.0%)**						

Source: USDA 2023a
[a] Farmland of Statewide Importance

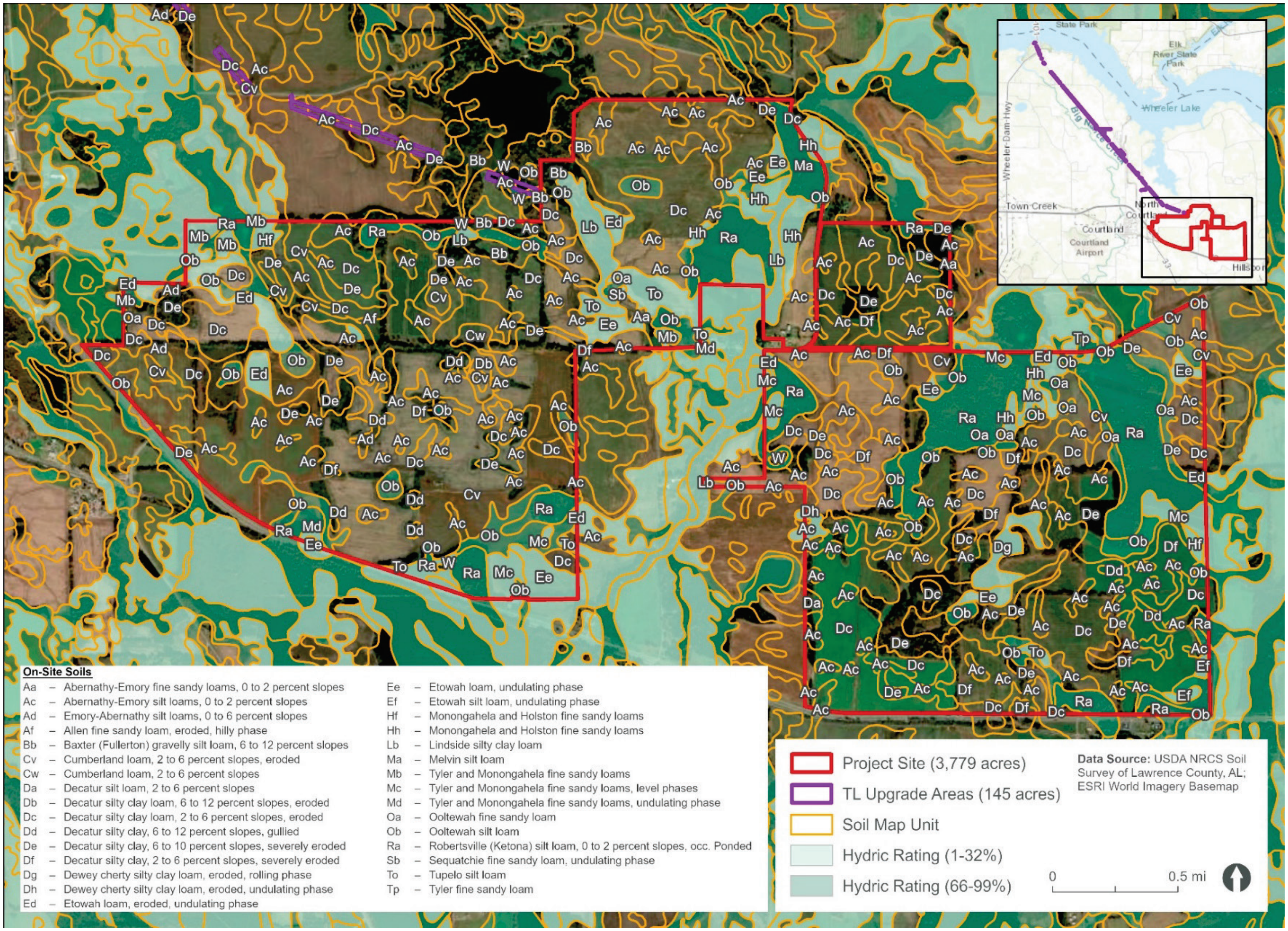

Figure 3-5. Soils on the Project Site

3.3.1.4.2 TL Upgrade Areas

The TL Upgrade Areas contains 24 soil types. Most of the soils on the TL Upgrade Areas are composed of Abernathy-Emory silt loams, zero to two percent slopes (16.6 percent); Cumberland loam, two to six percent slopes, eroded (16.6 percent); Decatur silty clay loam, two to six percent slopes, eroded (13.7 percent); Etowah silty clay loam, six to 12 percent slopes, eroded (8.7 percent); Decatur silty clay, six to 10 percent slopes, severely eroded (7.0 percent); Etowah loam, eroded, undulating phase (6.3 percent); and Abernathy-Emory fine sandy loams, zero to two percent slopes (5.2 percent); with other soil types consisting of less than four percent each (USDA 2023a; Table 3-3; Figure 3-6, Figure 3-7, and Figure 3-8). Most of the soils on the TL Upgrade Areas are not hydric. However, the Ooltewah silt loam, Prader silt loam, and Robertsville (Ketona) silt loam soils have a hydric rating of 66 to 99 percent, and six other soil types have a hydric rating of 1 to 32 percent. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA 2024a).

Table 3-3. Soils on the TL Upgrade Areas

Soil Type	Acreage and % of TL Upgrade Areas	Prime Farmland	Hydric Rating	Drainage Class	Flooding/ Ponding	Parent Material	Landform
Abernathy-Emory silt loams, 0 to 2 percent slopes (Ac)	24.0 (16.6%)	Yes	0	Well drained	No/ Occasional	Alluvium over residuum weathered from limestone	Drainageways on uplands
Cumberland loam, 2 to 6 percent slopes, eroded (Cv)	23.9 (16.6%)	Yes	0	Well drained	No/No	Alluvium over residuum weathered from limestone	Ridges on hills
Decatur silty clay loam, 2 to 6 percent slopes, eroded (Dc)	19.8 (13.7%)	Yes	0	Well drained	No/No	Clayey residuum weathered from limestone	Interfluves on hills
Etowah silty clay loam, 6 to 12 percent slopes, eroded (Eg)	12.6 (8.7%)	No	0	Well drained	No/No	Alluvium derived from sedimentary rock	Stream terraces on hills
Decatur silty clay, 6 to 10 percent slopes, severely eroded (De)	10.1 (7.0%)	No	0	Well drained	No/No	Clayey residuum weathered from limestone	Hillslopes on plateaus
Etowah loam, eroded, undulating phase (Ed)	9.0 (6.3%)	Yes	1	Well drained	No/No	Alluvium derived from sedimentary rock	Stream terraces
Abernathy-Emory fine sandy loams, 0 to 2 percent slopes (Aa)	7.5 (5.2%)	Yes	0	Well drained	No/ Occasional and No/No	Alluvium over residuum weathered from limestone	Drainageways and uplands
Ooltewah silt loam (Ob)	5.1 (3.6%)	No[a]	90	Somewhat poorly drained	No/ Occasional	Loamy alluvium derived from sedimentary rock	Floodplains
Emory-Abernathy silt loams, 0 to 6 percent slopes (Ad)	4.4 (3.1%)	Yes	0	Well drained	No/No and No/ Occasional	Alluvium over residuum weathered from limestone	Karst depressions and drainageways on uplands
Etowah silty clay loam, 2 to 6 percent slopes, eroded (Eh)	4.3 (2.9%)	Yes	0	Well drained	No/No	Alluvium derived from sedimentary rock	Stream terraces on hills

Soil Type	Acreage and % of TL Upgrade Areas	Prime Farmland	Hydric Rating	Drainage Class	Flooding/ Ponding	Parent Material	Landform
Cumberland loam, 6 to 12 percent slopes, eroded (Cu)	2.9 (2.0%)	No[a]	0	Well drained	No/No	Alluvium over residuum weathered from limestone	Ridges on hills
Decatur silty clay loam, 6 to 12 percent slopes, eroded (Db)	2.9 (2.0%)	No[a]	0	Well drained	No/No	Residuum weathered from limestone	Hillslopes and hills
Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded (Ra)	2.9 (2.0%)	No[a]	85	Poorly drained	No/ Occasional	Clayey alluvium derived from sedimentary rock	Stream terraces and valleys
Abernathy fine sandy loam, undulating phase (Ab)	2.7 (1.9%)	Yes	1	Well drained	No/Rare	Silty alluvium derived from sedimentary rock	Depressions
Baxter cherty silt loam, hilly phase (Bc)	2.2 (1.5%)	No	1	Well drained	No/No	Residuum weathered from cherty limestone	Hillslopes
Baxter (Fullerton) gravelly silt loam, 6 to 12 percent slopes, eroded (Bb)	1.9 (1.3%)	No[a]	0	Well drained	No/No	Residuum weathered from cherty limestone	Ridges on hills
Decatur silty clay, 2 to 6 percent slopes, severely eroded (Df)	1.8 (1.2%)	No[a]	0	Well drained	No/No	Clayey residuum weathered from limestone	Interfluves on hills
Water (W)	1.7 (1.2%)	No	0	Not applicable	Not applicable	Not applicable	Not applicable
Prader silt loam (Ph)	1.6 (1.1%)	No	90	Poorly drained	Frequent/ Occasional	Clayey fluviomarine deposits derived from igneous and metamorphic rock	Floodplains
Decatur silty clay, 6 to 12 percent slopes, gullied (Dd)	1.5 (1.0%)	No[a]	0	Well drained	No/No	Residuum weathered from limestone	Interfluves and hills
Etowah loam, undulating phase (Ee)	0.6 (0.4%)	Yes	1	Well drained	No/No	Alluvium derived from sedimentary rock	Stream terraces
Sequatchie fine sandy loam, eroded, undulating phase (Sa)	0.5 (0.3%)	Yes	1	Well drained	No/No	Loamy alluvium derived from sedimentary rock	Stream terraces

Soil Type	Acreage and % of TL Upgrade Areas	Prime Farmland	Hydric Rating	Drainage Class	Flooding/ Ponding	Parent Material	Landform
Decatur silt loam, 2 to 6 percent slopes (Da)	0.3 (0.2%)	Yes	0	Well drained	No/No	Clayey residuum weathered from limestone	Ridges on hills
Waynesboro clay loam, severely eroded, rolling phase (Wa)	0.3 (0.2%)	No[a]	1	Well drained	No/No	Clayey alluvium derived from sandstone and shale	Hillslopes
Udorthents (Ud)	<0.1 (<0.1%)	No	0	—	No/No	Mine spoil or earthy fill	Hillslopes
Total Prime Farmland	**97.1 (67.2%)**						
Total Farmland of Statewide Importance	**19.4 (13.4%)**						

Source: USDA 2023a
[a] Farmland of Statewide Importance
"—" indicates that no data is available

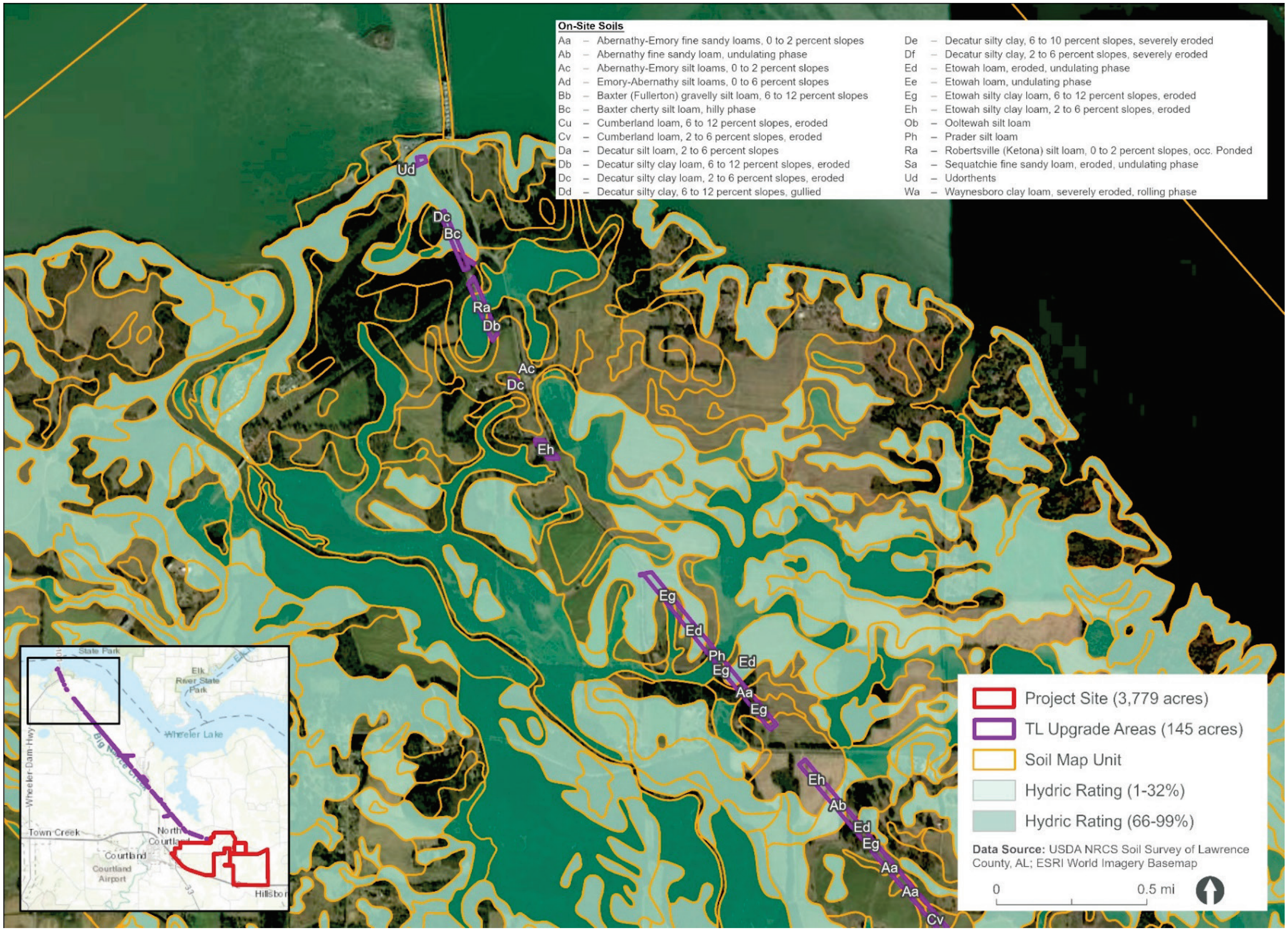

Figure 3-6. Soils on the northern portion of the TL Upgrade Areas

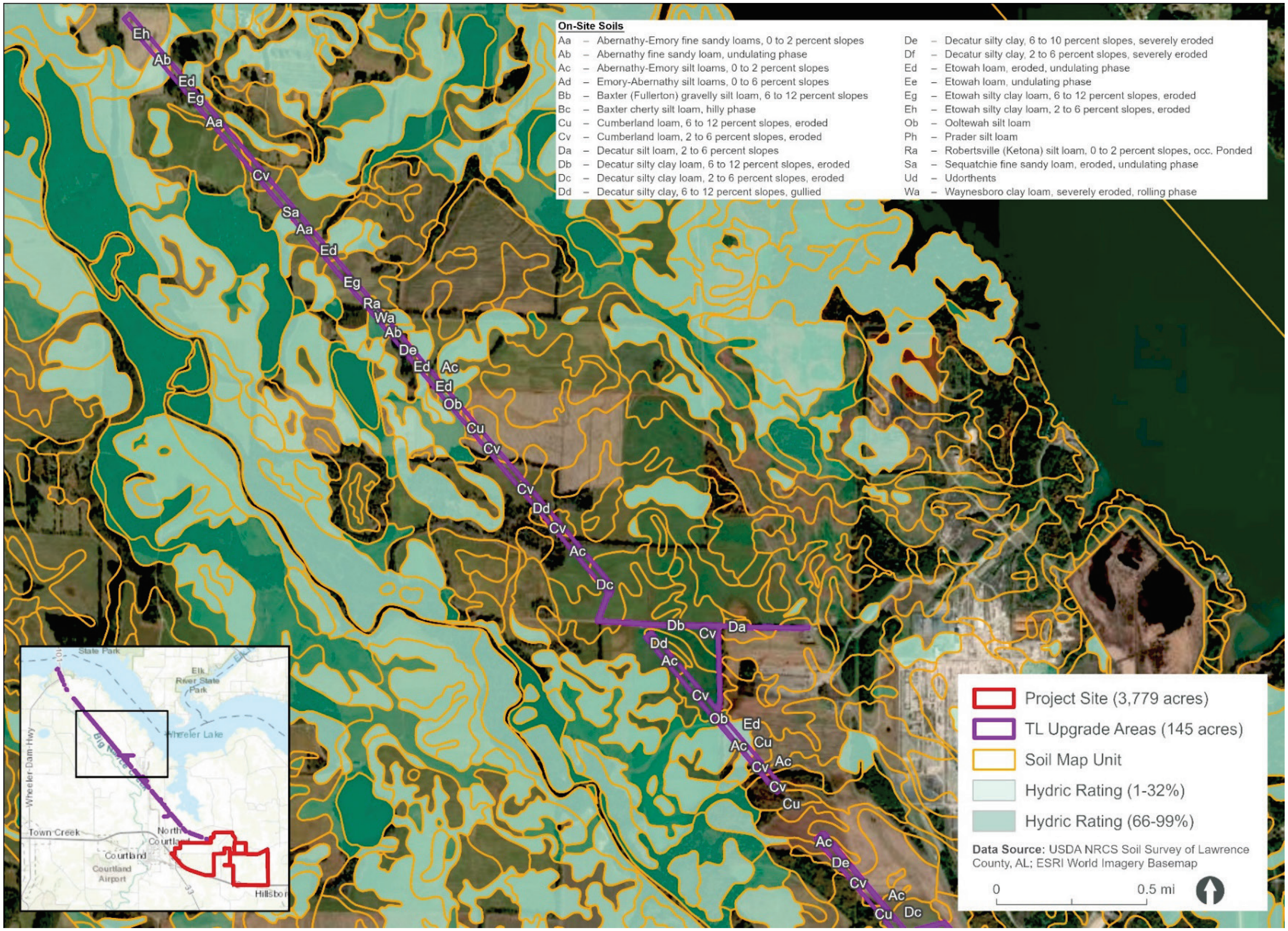

Figure 3-7. Soils on the central portion of the TL Upgrade Areas

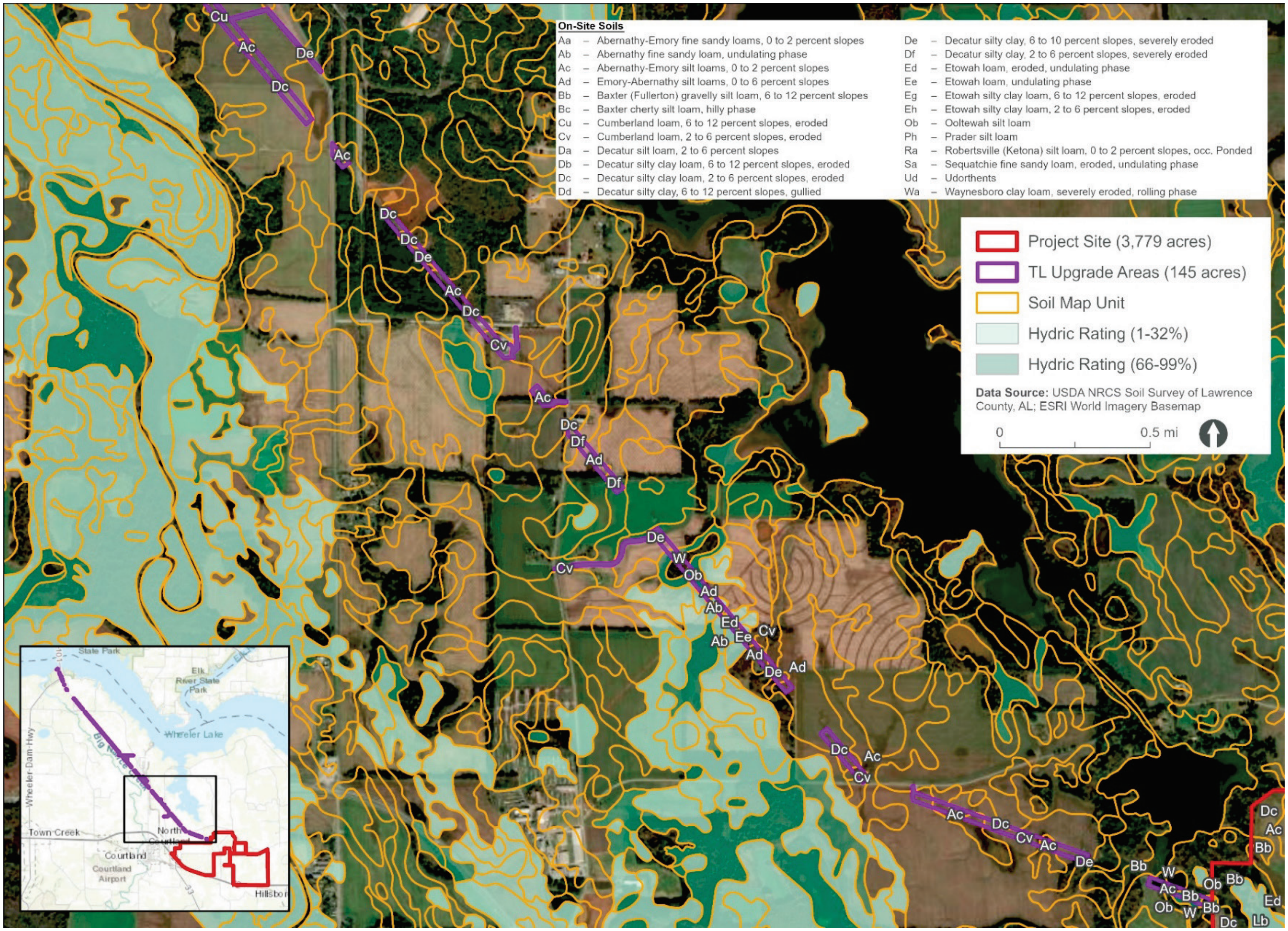

Figure 3-8. Soils on the southern portion of the TL Upgrade Areas

3.3.1.5 Prime Farmland

Prime farmland is land that is the most suitable for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops. Prime farmlands have the best combination of soil type, growing season, and moisture supply and are available for agricultural use (i.e., not water or urban built-up land). In addition to prime farmland and unique farmland, farmland of statewide importance is land that a state determines to be important for producing food, feed, fiber, forage, and oil seed crops. Farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. The Farmland Protection Policy Act (7 U.S.C. § 4201 *et seq.*), requires federal agencies to consider the adverse effects of their actions on prime or unique farmlands. The purpose of the Farmland Protection Policy Act is "to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses."

3.3.1.5.1 Project Site

Based on soils data obtained from the USDA Web Soil Survey, approximately 2,563 acres (68 percent) of the Project Site are designated as prime farmland and an additional 870 acres (23 percent) of the Project Site are designated as farmland of statewide importance, as illustrated in Figure 3-9. Table 3-2 describes the soil types, including those classified as prime farmland, on the Project Site.

3.3.1.5.2 TL Upgrade Areas

Based on soils data obtained from the USDA Web Soil Survey, approximately 97 acres (67 percent) of the TL Upgrade Areas are designated as prime farmland and approximately 19 acres (13 percent) of the TL Upgrade Areas are designated as farmland of statewide importance, as illustrated in Figure 3-10, Figure 3-11, and Figure 3-12. Table 3-3 describes the soil types, including those classified as prime farmland, on the TL Upgrade Areas.

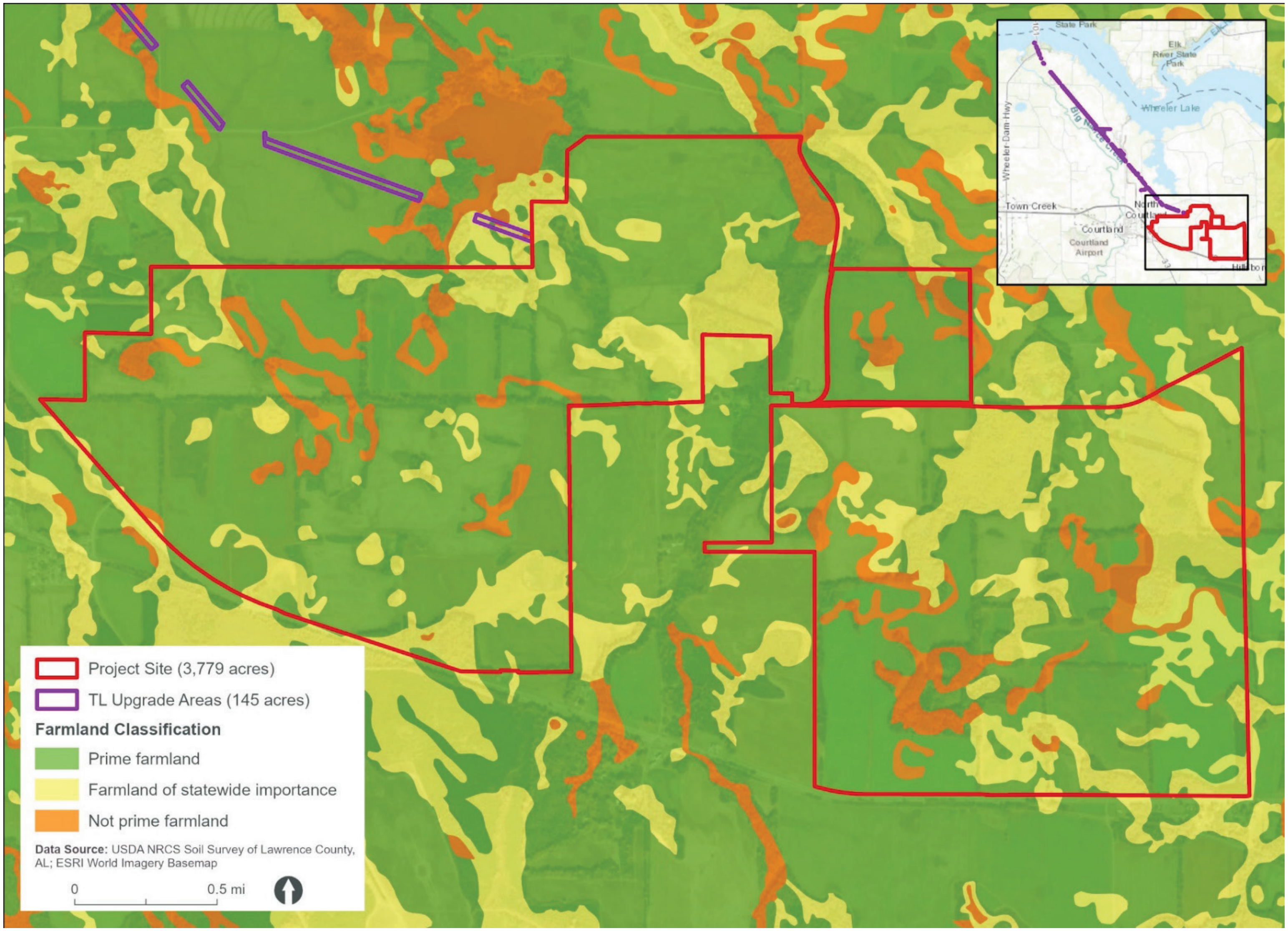

Figure 3-9. Farmland classifications on the Project Site

Figure 3-10. Farmland classifications on the northern portion of the TL Upgrade Areas

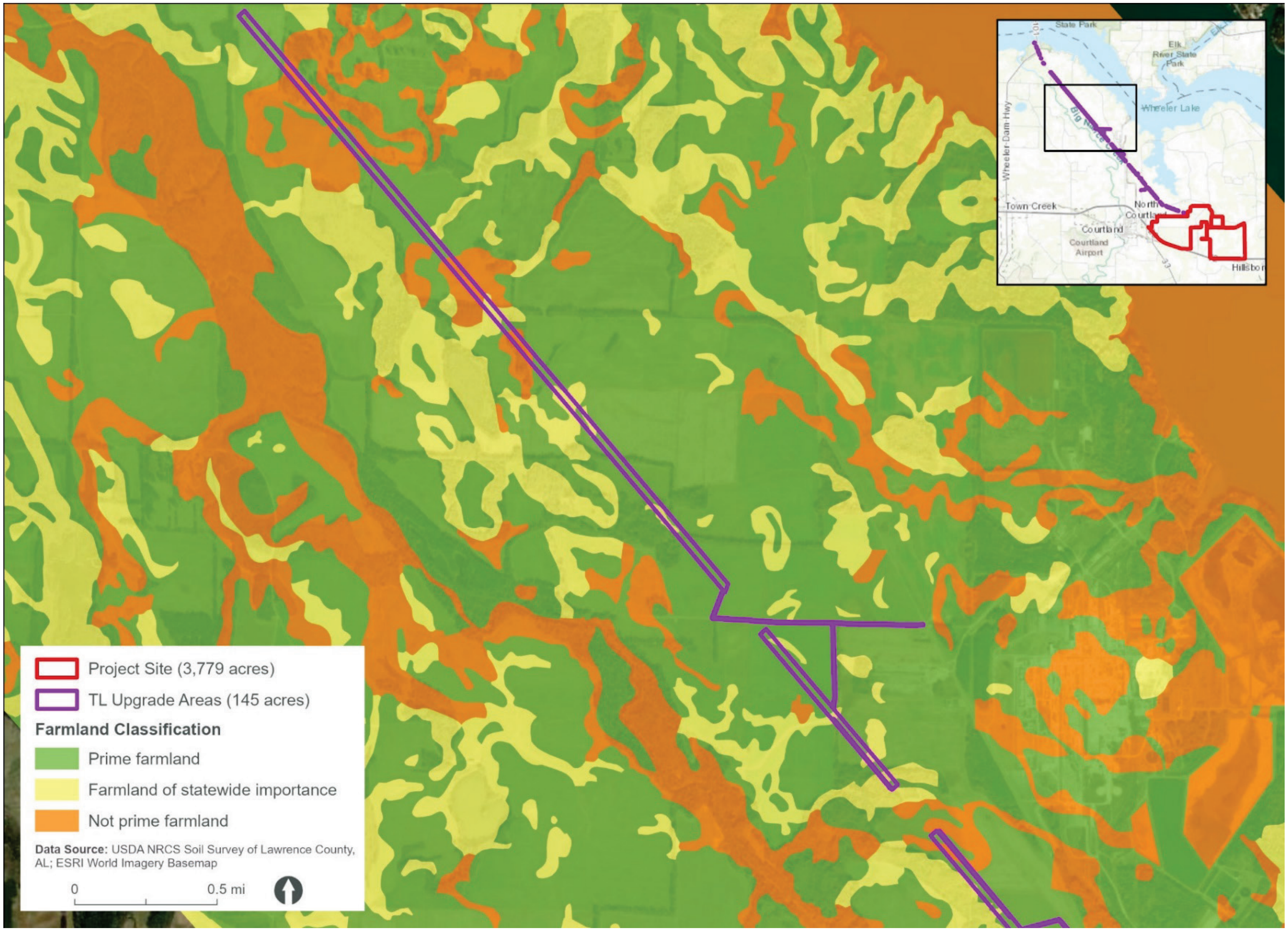

Figure 3-11. Farmland classifications on the central portion of the TL Upgrade Areas

Figure 3-12. Farmland classifications on the southern portion of the TL Upgrade Areas

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; therefore, no direct or indirect Project-related impacts on geological or paleontological resources, soils, or prime farmlands would result. Existing land use would likely remain primarily agricultural land for the foreseeable future.

3.3.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, direct impacts to geology, soils, and prime farmland resources would occur as a result of construction and operation of the Project.

3.3.2.2.1 Geology

3.3.2.2.1.1 Project Site

Under the Proposed Action Alternative, minor impacts to geological resources are anticipated due to the relatively limited amount of subsurface disturbance required for the solar facility development. On-site sedimentation basins would be shallow and, to the extent feasible, utilize the existing terrain without requiring extensive excavation. Other excavations would be no more than a few feet deep. The steel piles supporting the solar arrays would either be driven or screwed into the ground to a depth typically less than 10 feet. Given that depth to bedrock is greater than 18 feet below ground surface, driven or screwed piles should not impact underlying geology (GSA 2024).

3.3.2.2.1.2 TL Upgrade Areas

Under the Proposed Action Alternative, minor impacts to geological resources are anticipated due to the relatively limited amount of subsurface disturbance required for the TL upgrades. New poles would be augured into the ground to a depth equal to 10 percent of the pole's length plus an additional two feet, typically about 10 to 12 feet deep. Installation of the new poles would require blasting where bedrock is within the depth necessary to imbed the poles. Normally, the holes would be backfilled with the excavated material, but in some cases, gravel or a concrete-and-gravel mixture would be used, depending on local soil conditions.

3.3.2.2.2 Paleontology

3.3.2.2.2.1 Project Site

Should paleontological resources be exposed during site construction or operation activities, a paleontological expert would be consulted to evaluate the nature of the paleontological resources, recover these resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy.

3.3.2.2.2.2 TL Upgrade Areas

Potential impacts and mitigation measures on paleontological resources are similar to what is described for the Project Site in Section 3.3.2.2.1.1.

3.3.2.2.3 Geological Hazards

3.3.2.2.3.1 Project Site

Hazards resulting from geological conditions may be encountered in the form of sinkholes. The Project Site is located over limestone bedrock that is susceptible to erosion and formation of sinkholes. The Project Site contains 20 sinkholes mapped by the GSA. Portions of a solar panel block would be constructed in the location of one of these mapped sinkholes. Based on results of initial geotechnical surveys of the Project Site, Hillsboro

Solar, LLC or the construction contractor would conduct a more detailed geotechnical study if deemed necessary to design the facility to minimize effects from sinkholes. The Project Site has low risk for earthquakes that may cause structural damage. The Project would be designed to comply with applicable standards to minimize issues pertaining to sinkholes and seismic activity. Geologic hazard impacts on-site would be unlikely to impact off-site resources.

3.3.2.2.3.2 TL Upgrade Areas

Potential impacts and mitigation measures on geologic hazards are similar to what is described for the Project Site in Section 3.3.2.2.3.1.

3.3.2.2.4 Soils

3.3.2.2.4.1 Project Site

During construction, soils on the 1,610 acres proposed for development of the solar facility would be disturbed due to site preparation and construction activities. Soils on the 50 acres of species-rich native plant meadows would be minimally disturbed from use of a seed drill or planter during initial establishment. None of the soils on the Project Site have characteristics that would require special construction techniques or other non-routine measures. Any stockpiled soils from the area where vegetation clearing and grading occurs, including topsoil, would be replaced following cut-and-fill activities to the extent practicable and, therefore, likely not require off-site disposal. However, some minimal off-site disposal may be necessary. Should borrow material such as sand, gravel, rip rap, or other aggregate, such as large rocks, be required for Project Site activities, these resources may be obtained either from on-site sources, if available, or from nearby permitted off-site sources.

Creating small areas of impervious surface in the form of foundations for the inverters and the Hillsboro III Solar substation, Bride's Hill switching station, and associated components, would result in a minor increase in stormwater runoff and potential increase in soil erosion. Revegetation with noninvasive grasses along with use of BMPs described in the CBMPP (see Section 1.5), such as soil erosion and sediment control measures, would minimize the potential for increased soil erosion and stormwater runoff. Following construction, implementation of soil stabilization and vegetation management measures would reduce the potential for erosion impacts during facility operations. The cessation of farming and subsequent revegetation on other portions of the Project Site, including the establishment and maintenance of species-rich native plant meadows, would also reduce the potential for land surface erosion.

During operation and maintenance of the solar facility and associated interconnection facilities, minor disturbance could occur to soils. Routine maintenance would include periodic motor replacement; inverter air filter replacement; fence repair; vegetation management; and periodic PV array inspection, repairs, and maintenance. The Project would manage vegetation using lawnmowers and weed eaters. Trimming and mowing would likely be performed several times per year, depending on growth rate, to maintain an appropriate groundcover height of approximately 12 to 18 inches. Selective spot applications of herbicides may be employed around facilities and structures to control weeds. Herbicides would be applied by a professional contractor or a qualified Project technician. These maintenance activities would not result in any adverse impacts to soils during operations.

3.3.2.2.4.2 TL Upgrade Areas

TL upgrades would require improvements to existing access roads, construction of temporary access roads, replacement of one TL structure, and installation of four new TL pole structures. Minor ground disturbance is expected in these areas, but if the ground is disturbed, the access road area would be revegetated using native, low-growing plant species after required TL upgrade work is completed to minimize the potential for increased soil erosion and stormwater runoff (TVA 2022a). Impacts to soils associated with TL upgrade activities would be temporary and mitigated through BMPs, as identified in Section 2.5.1.

3.3.2.2.5 Prime Farmland

3.3.2.2.5.1 Project Site

Approximately 1,610 acres (43 percent) of the 3,779-acre Project Site would be developed into the solar facility. Prime farmland comprises 1,309 acres of the developed area and an additional 151 acres is farmland of statewide importance. An additional 1,386 acres of farmland in the undeveloped portions of the Project Site would no longer be farmed. The conversion of 1,309 acres of prime farmland and 151 acres of farmland of statewide importance to nonagricultural uses during the construction and operation of the solar facility would not impact the prime farmland and farmland of statewide importance designations on the land and would result in minimal adverse impacts to soils. The loss of production wwould,however, result in moderate adverse impacts. The 2,846 acres of farmland removed from row cropping during the lifetime of the Project represents 1.4 percent of the 209,398 acres of farmland in Lawrence County and following decommissioning of the solar facility, the Project Site could be returned to agricultural use with little reduction in soil productivity or impacts to prime farmland.

3.3.2.2.5.2 TL Upgrade Areas

Approximately 97 acres (67 percent) of the TL Upgrade Areas are designated as prime farmland and approximately 19 acres (13 percent) of the TL Upgrade Areas are designated as farmland of statewide importance. This represents less than 0.1 percent of the 209,398 acres of farmland in Lawrence County (USDA 2024b). Ground disturbance would be minimal, temporary, and mitigated through BMPs as identified in Section 2.5.1 and TVA’s BMP Manual (TVA 2022a). Therefore, no impacts to prime farmland would occur as a result of TL upgrades.

3.3.2.3 Cumulative Impacts

The RFFAs such as the adjacent North Alabama Utility-Scale Solar Facility and development of the industrial parks, together with the Proposed Action, could disturb subsurface materials in the area and create new impervious surfaces in the area, resulting in minor, cumulative adverse impacts on geology and soils, including the development of up to about 5,270 acres for industrial uses. The development of the adjacent North Alabama Utility-Scale Solar Facility, together with the Proposed Action, would remove approximately 2,383 acres of prime farmland, 500 acres of farmland of statewide importance, and an additional 1,386 acres of farmland in the undeveloped portions of the Project Site from row cropping during the lifetime of the projects. Additionally, the development of the industrial parks could remove about 1,630 acres of prime farmland and about 270 acres of farmland of statewide importance from agricultural use (USDA 2023a). Therefore, the Proposed Action, when considered with the RFFAs, would have moderate to large, cumulative impacts on prime farmland.

3.4 Water Resources

3.4.1 Affected Environment

3.4.1.1 Groundwater

Groundwater is water beneath the ground surface, within soils and subsurface formations known as hydrogeological units or aquifers (USGS 2018a). Aquifers have sufficient permeability to conduct groundwater infiltration and to allow economically significant quantities of water to be produced by man-made water wells and natural springs.

Groundwater moves easily through carbonate aquifers due to their non-uniform permeability and cavernous features. Such aquifers are referred to as anisotropic. Groundwater movement in anisotropic aquifers is affected primarily by gravity but also by the geometry of the confining fracture system. The cavernous features or large areas of porosity have been formed by solution processes in fractures and fracture systems at many places in the carbonate aquifers. If sufficient hydraulic gradient is present water can move quite rapidly through these fractures or systems of fractures (Bossong and Harris 1987).

3.4.1.1.1 Project Site

The Project Site is in the Eastern Highland Rim section of the Interior Low Plateaus physiographic province. The Tuscumbia-Fort Payne aquifer underlies the Project Site and consists of limestone and chert bed. The Tuscumbia-Fort Payne aquifer is a Mississippian carbonate aquifer comprised of the Tuscumbia limestone, Fort Payne Chert, and a small area of the Monteagle Limestone (Bossong and Harris 1987). The aquifer is recharged by water which infiltrates and percolates through the soil and entering the underlying Chattanooga Shale aquifer.

Water in the Tuscumbia-Fort Payne aquifer is partially confined because of the lower hydraulic conductivity of the overlying residual mantle. The Tuscumbia-Fort Payne aquifer is the most widely used aquifer for public water supply in the area. Large porous areas are present where dissolution has enlarged the joints and bedding-planes. Wells that penetrate these areas produce large quantities of water (Bossong and Harris 1987). The Tuscumbia limestone interconnected with the Fort Payne Chert, yields as much as 2,300 gallons per minute (Miller 2000). One well was identified on the GSA on-line mapping application within the Project Site, identified by well ID 079G28001. This well is reported to be a 75-foot-deep, 6-inch-diameter well. No additional information regarding pumping rate or water quality was available. Wells in the area have been documented with pumping rates from 100 to 1,000 gallons per minute (ADEM 2001).

Groundwater flow within the Tuscumbia-Fort Payne aquifer is primarily affected by topography, structure, and the development of solution openings in the rocks (Miller 2000). Groundwater flow in the Project Site is likely northward toward the Tennessee River with minor variations related to topography. The trend is for groundwater to move from higher to lower topographic areas (Rutledge 2016).

3.4.1.1.2 TL Upgrade Areas

The groundwater associated with the TL Upgrade Areas is generally the same as described for the Project Site in Section 3.4.1.1.1.

3.4.1.2 Surface Water

Surface water is any water that flows above ground and includes, but is not limited to, streams, ditches, ponds, lakes, and wetlands. Streams are classified as either perennial, intermittent, or ephemeral based on the occurrence of surface flow. Perennial streams are streams that are relatively permanent waters with perennial flow from the groundwater table, which is generally located above the streambed throughout the year. Intermittent streams are streams that typically have baseflow at least once per year, typically, in the winter and spring. Ephemeral streams are streams that are above the groundwater table and convey flow only during, and for a short duration after (generally less than 48 hours), and in direct response to, a precipitation event. TVA requires that watercourses, such as streams and wet weather conveyances (WWCs) be assessed using Tennessee Department of Environment and Conservation (TDEC) Hydrological Determination (HD) forms regardless of the state the Project is located in. A watercourse or ditch that carries water and is not a stream is classified as a WWC. Wetlands are those areas inundated by surface water or groundwater such that vegetation adapted to saturated soil conditions is prevalent. Examples of wetlands include swamps, marshes, bogs, and wet meadows.

Surface waters with certain physical and hydrologic characteristics (defined bed and bank, ordinary high-water mark, or specific hydrologic, soil, and vegetation criteria) are considered WOTUS (or jurisdictional waters). These include navigable waters, impoundments of navigable waters, relatively permanent tributaries of navigable waters, and contiguous or adjoining wetlands (Sackett v. USEPA 2023).

The CWA is the primary federal statute that governs the discharge of pollutants and fill materials into WOTUS. The limits on activities affecting CWA Section 404 WOTUS are defined through a jurisdictional determination accepted by USACE. CWA Section 404 NWPs are issued by USACE to authorize the construction, expansion, or modification of certain activities that would discharge dredged or fill material into WOTUS, provided the proposed activities meet specific criteria. Solar facility impacts resulting in less than 0.5 acre of fill are often authorized under Number 12 (Utility Line Activities), Number 14 (Linear Transportation Projects), and/or Number 51 (Land-Based Renewable Energy Generation Facility). If the fill area exceeds 0.5 acre, a USACE Individual Permit is required. The limits on activities affecting CWA Section 401 state waters are defined by both a USACE jurisdictional determination and an HD accepted by ADEM. Project Site development would also be subject to potential permitting through ADEM via an application for a Section 401 permit.

Using a TVA-developed modification of the Ohio Rapid Assessment Method (Mack 2001) specific to the TVA region (TVA Rapid Assessment Method [TVARAM]), wetlands on the Project Site were evaluated by their functions and classified into three categories: low (scores 0–29), good/moderate (30–59), and superior (60–100). Low quality wetlands are degraded aquatic resources that 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 of low value. Moderate quality wetlands provide functions at a greater value due to less 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 and there is reasonable potential for restoration. Superior quality wetlands offer superior functions and values within a watershed or are of regional/statewide concern. These wetlands may exhibit little to no recent disturbance; provide substantial large-scale stormwater storage, sediment retention, and toxin absorption; contain mature vegetation communities; or offer habitat to rare species. Conditions in superior quality wetlands often represent restoration goals for wetlands functioning at a lower capacity.

3.4.1.2.1 Project Site

The Project Site is in the Dry Creek-Mallard Creek (12-digit Hydrologic Unit Code [HUC] 060300021106), Red Branch-Spring Creek (060300021201), and Lower Big Nance Creek (060300050105) watersheds. On-site surface waters drain to Spring Creek, Red Branch, and Wheeler Branch, which generally flow northward and join with the Wheeler Reservoir portion of the Tennessee River.

Field surveys were conducted in August and October 2023 to determine the presence of streams and wetlands (Appendix A). A total of six perennial streams (8,917 linear feet [LF]), five intermittent streams (1,341 LF), 12 WWCs (4,004 LF), nine emergent wetlands (14.1 acres), three scrub-shrub wetlands (12.9 acres), 28 forested wetlands (314 acres), and two open waters (ponds) (1.5 acre) were identified on the Project Site (Table 3-5, Table 3-6, Table 3-7, and Table 3-7; Figure 3-13). Six of the wetlands were delineated to be low quality (2.4 acres), 25 of the wetlands were delineated to be moderate quality (145.7 acres), and nine of the wetlands were delineated to be superior quality (192.7 acres) based on TVARAM.

Table 3-4. Summary of presumed jurisdictional waters on the Project Site

Feature Identifier	Flow Regime	Cowardin Code[1]	TDEC HD (Score)[2]	SMZ Category[3]	Presumed Section 404 and 401 Jurisdiction	LF within Project Site
S001	Intermittent	R4SB5	Stream (22.5)	A	Yes	376
S002	Intermittent	R4SB5	Stream (19)	A	Yes	140
S003	Perennial	R5UB3	Stream (30)	A	Yes	404
S004	Perennial	R5UB3	Stream (30)	A	Yes	235
S005	Intermittent	R4SB5	Stream (27.5)	A	Yes	154
S006	Perennial	R3UB2	Stream (36)	A	Yes	2,436
S007	Intermittent	R4SB5	Stream (19)	A	Yes	161
S008	Perennial	R3UB2	Stream (43.5)	B	Yes	5,541
S009	Perennial	R5UB3	Stream (35)	A	Yes	256
S010	Intermittent	R4SB5	Stream (25)	A	Yes	510
S011	Perennial	R5UB3	Stream (30)	A	Yes	45
					Total Length:	**10,258**

[1] R3UB2: Riverine, upper perennial, unconsolidated bottom, sand
R4SB5: Riverine, intermittent, streambed, mud
R5UB3: Riverine, unknown perennial, unconsolidated bottom, mud

[2] When applying HD methodology, watercourses are scored based on primary and secondary field indicators. Primary indicators (denoted as a score of "P") are individual or combinations of field characteristics that, under normal circumstances and in the absence of any directly contradictory evidence, are considered to be definitive for jurisdictional purposes. Secondary indicators are evaluated if none of the primary indicators are present at the time of survey. A watercourse is considered a stream if the secondary indicators score greater than 19 or else is considered a WWC.

[3] A = Requires a 50-foot undisturbed natural buffer
B = Requires a 70-foot undisturbed natural buffer

Table 3-5. Summary of presumed non-jurisdictional waters on the Project Site

Feature Identifier	Cowardin Code[1]	TDEC HD (Score)[2]	SMZ Category	Presumed Section 404 and 401 Jurisdiction	LF within Project Site
E001	R6	WWC (2.5)	BMPs	No	708
E002	R6	WWC (6)	BMPs	No	902
E003	R6	WWC (13.5)	BMPs	No	70
E004	R6	WWC (11.5)	BMPs	No	727
E005	R6	WWC (8)	BMPs	No	393
E006	R6	WWC (17.5)	BMPs	No	316
E007	R6	WWC (15.5)	BMPs	No	79
E008	R6	WWC (18)	BMPs	No	73
E018	R6	WWC (5.5)	BMPs	No	21
E019	R6	WWC (7)	BMPs	No	237
E020	R6	WWC (8)	BMPs	No	274
E021	R6	WWC (8)	BMPs	No	204
				Total Length:	**4,004**

[1] R6: Riverine, ephemeral
[2] When applying HD methodology, watercourses are scored based on primary and secondary field indicators. Primary indicators (denoted as a score of "P") are individual or combinations of field characteristics that, under normal circumstances and in the absence of any directly contradictory evidence, are considered to be definitive for jurisdictional purposes. Secondary indicators are evaluated if none of the primary indicators are present at the time of survey. A watercourse is considered a stream if the secondary indicators score greater than 19 or else is considered a WWC.

Table 3-6. Summary of wetlands on the Project Site

Feature Identifier	Cowardin Code[1]	TVARAM Category (Score)[2]	SMZ Category[3]	Presumed Section 404 and 401 Jurisdiction	Acreage within Project Site
W001	PFO1C	Moderate (42)	A	No	0.77
W002a	PFO1C	Superior (61)	A	Yes	11.17
W002b	PEM1C	Moderate (37)	A	Yes	1.99
W002c	PEM1C	Moderate (37)	A	Yes	0.73
W003	PFO1C	Moderate (45)	A	No	0.37
W004	PSS1C	Moderate (46)	A	No	4.85
W005a	PEM1C	Moderate (36)	A	No	0.14
W005b	PFO1C	Moderate (41)	A	Yes	0.66
W005c	PEM1C	Moderate (37)	A	Yes	0.34
W006	PFO1E	Superior (68)	A	Yes	6.95
W007	PEM1E	Superior (62)	A	Yes	0.40
W008	PFO1E	Superior (81)	A	Yes	19.46
W009	PEM1C	Moderate (37)	A	No	0.95
W010	PEM1C	Moderate (37)	A	No	6.74
W011	PSS1E	Moderate (43)	A	No	4.35
W012	PFO1B	Moderate (55)	A	Yes	29.07
W013	PFO1C	Superior (60)	A	Yes	31.49

Feature Identifier	Cowardin Code[1]	TVARAM Category (Score)[2]	SMZ Category[3]	Presumed Section 404 and 401 Jurisdiction	Acreage within Project Site
W014	PFO1C	Moderate (54)	A	Yes	0.93
W015	PFO1C	Superior (77)	A	Yes	13.71
W016	PSS1E	Moderate (52)	A	Yes	3.66
W017	PFO1A	Superior (60)	A	Yes	27.17
W018	PFO1C	Moderate (54)	A	Yes	12.69
W019	PFO1C	Moderate (54)	A	No	0.80
W020	PFO1E	Moderate (51)	A	Yes	61.40
W021	PFO1E	Low (24)	A	No	0.27
W022	PFO1E	Low (24)	A	No	1.14
W023	PFO1E	Low (24)	A	No	0.23
W024	PFO1E	Superior (66)	A	Yes	70.03
W025	PFO1E	Low (20)	A	No	0.08
W026	PFO1E	Low (24)	A	Yes	0.42
W027a	PFO1E	Moderate (51)	A	No	0.03
W027b	PEM1E	Low (23)	A	No	0.30
W028	PFO1E	Moderate (54)	A	No	1.59
W029	PFO1E	Moderate (47)	A	No	1.94
W030a	PEM1E	Moderate (47)	A	Yes	2.50
W030b	PFO1E	Superior (61)	A	Yes	12.32
W031	PFO1E	Moderate (38)	A	Yes	3.92
W032	PFO1E	Moderate (50)	A	Yes	4.16
W033	PFO1E	Moderate (41)	A	Yes	0.76
W038	PFO1E	Moderate (32)	A	Yes	0.43
				Total Area:	**340.91**

[1] PEM1C: Palustrine, emergent, persistent, seasonally flooded wetland
PEM1E: Palustrine, emergent, persistent, seasonally flooded/saturated wetland
PSS1C: Palustrine, scrub-shrub, persistent, seasonally flooded wetland
PSS1E: Palustrine, scrub-shrub, persistent, seasonally flooded/saturated wetland
PFO1A: Palustrine, forested, broad-leaved deciduous, temporary flooded wetland
PFO1B: Palustrine, forested, broad-leaved deciduous, saturated wetland
PFO1C: Palustrine, forested, broad-leaved deciduous, seasonally flooded wetland
PFO1E: Palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated wetland

[2] When applying TVARAM methodology, wetlands are scored into three categories based on wetland function, condition, and quality: low (scores 0–29), good/moderate (30–59), and superior (60–100).

[3] A = Requires a 50-foot undisturbed natural buffer

Table 3-7. Summary of open waters on the Project Site

Feature Identifier	Cowardin Code[1]	SMZ Category[2]	Presumed Section 404 and 401 Jurisdiction	Acreage within Project Site
P001	PUBH	BMPs	Yes	0.15
P002	PUBH	BMPs	Yes	1.32
			Total Area:	**1.47**

[1] PUBH: Palustrine Unconsolidated Bottom, Permanently Flooded

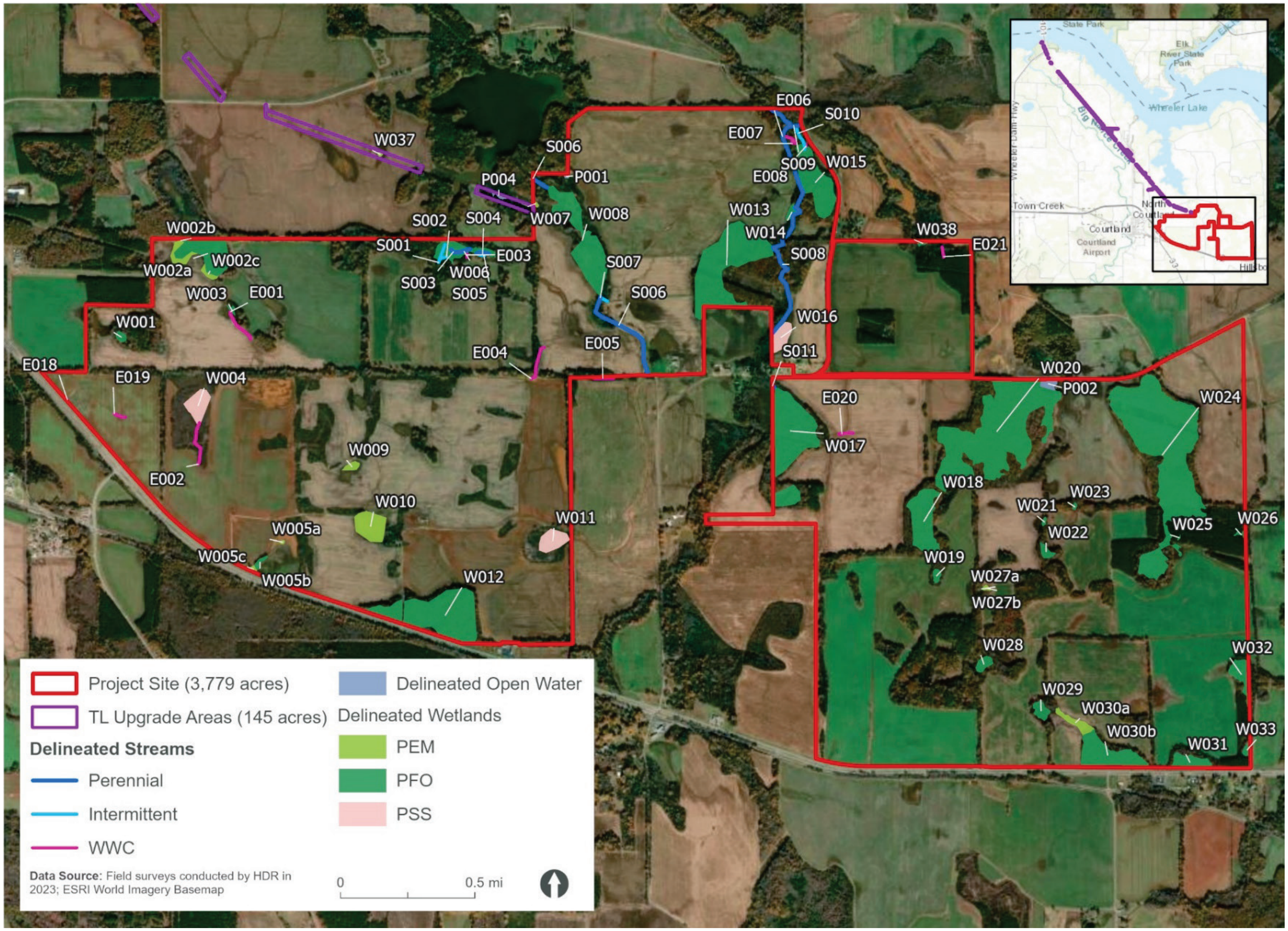

Figure 3-13. Delineated streams, wetlands, and open waters on the Project Site

3.4.1.2.2 TL Upgrade Areas

The TL Upgrade Areas are in the Red Branch-Spring Creek (060300021201), Lower Big Nance Creek (060300050105), and McKieman Creek-Tennessee River (060300050801) watersheds. Surface waters within the TL Upgrade Areas drain to Big Nance Creek and Spring Creek, which generally flow northward and join with the Wilson Reservoir portion and the Wheeler Reservoir portion of the Tennessee River, respectively.

Field surveys were conducted in August and October 2023 to determine the presence of streams and wetlands (Appendix A). A total of one intermittent stream (145 LF), nine WWCs (1,164 LF), four emergent wetlands (2.8 acres), and two open waters (0.5 acre) were identified within the TL Upgrade Areas (Table 3-8, Table 3-9, Table 3-10, Table 3-11; Figure 3-14, Figure 3-15, Figure 3-16).

Table 3-8. Summary of presumed jurisdictional waters within the TL upgrade areas

Feature Identifier	Flow Regime	Cowardin Code[1]	TDEC HD (Score)[2]	SMZ Category[3]	Presumed Section 404 and 401 Jurisdiction	LF within TL Upgrade Areas
S012	Intermittent	R4SB5	Stream (19)	A	Yes	145
					Total Length:	**145**

[1] R4SB5: Riverine, intermittent, streambed, mud
[2] When applying HD methodology, watercourses are scored based on primary and secondary field indicators. Primary indicators (denoted as a score of “P”) are individual or combinations of field characteristics that, under normal circumstances and in the absence of any directly contradictory evidence, are considered to be definitive for jurisdictional purposes. Secondary indicators are evaluated if none of the primary indicators are present at the time of survey. A watercourse is considered a stream if the secondary indicators score greater than 19 or else is considered a WWC.
[3] A = Requires a 50-foot undisturbed natural buffer

Table 3-9. Summary of presumed non-jurisdictional waters within the TL upgrade areas

Feature Identifier	Cowardin Code[1]	TDEC HD (Score)[2]	SMZ Category	Presumed Section 404 and 401 Jurisdiction	LF within TL Upgrade Areas
E009	R6	WWC (5)	BMPs	No	104
E010	R6	WWC (3)	BMPs	No	225
E011	R6	WWC (8.5)	BMPs	No	110
E012	R6	WWC (7)	BMPs	No	75
E013	R6	WWC (5.5)	BMPs	No	112
E014	R6	WWC (5.5)	BMPs	No	59
E015	R6	WWC (8.5)	BMPs	No	174
E016	R6	WWC (11.5)	BMPs	No	146
E017	R6	WWC (8.5)	BMPs	No	159
				Total Length:	**1,164**

[1] R6: Riverine, ephemeral
[2] When applying HD methodology, watercourses are scored based on primary and secondary field indicators. Primary indicators (denoted as a score of “P”) are individual or combinations of field characteristics that, under normal circumstances and in the absence of any directly contradictory evidence, are considered to be definitive for jurisdictional purposes. Secondary indicators are evaluated if none of the primary indicators are present at the time of survey. A watercourse is considered a stream if the secondary indicators score greater than 19 or else is considered a WWC.

Table 3-10. Summary of wetlands within the TL upgrade areas

Feature Identifier	Cowardin Code[1]	TVARAM Category (Score)[2]	SMZ Category[3]	Presumed Section 404 and 401 Jurisdiction	Acreage within TL Upgrade Areas
W034	PEM1C	Low (21)	A	Yes	0.13
W035	PEM1C	Low (18)	A	No	0.09
W036	PEM1C	Moderate (43)	A	Yes	2.37
W037	PEM1C	Low (11)	A	No	0.25
				Total Area:	**2.84**

[1] PEM1C: Palustrine, emergent, persistent, seasonally flooded wetland
PFO1E: Palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated wetland
[2] When applying TVARAM methodology, wetlands are scored into three categories based on wetland function, condition, and quality: low (scores 0–29), good/moderate (30–59), and superior (60–100).
[3] A = Requires a 50-foot undisturbed natural buffer

Table 3-11. Summary of open waters within the TL upgrade areas

Feature Identifier	Cowardin Code[1]	SMZ Category[2]	Presumed Section 404 and 401 Jurisdiction	Acreage within TL Upgrade Areas
P003	PUBH	BMPs	Yes	0.04
P004	PUBH	BMPs	Yes	0.47
			Total Area:	0.51

[1] PUBH: Palustrine Unconsolidated Bottom, Permanently Flooded

Figure 3-14. Delineated streams, wetlands, and open waters on the northern portion of the TL Upgrade Areas

Figure 3-15. Delineated streams, wetlands, and open water on the central portion of the TL Upgrade Areas

Figure 3-16. Delineated streams, wetlands, and open waters on the southern portion of the TL Upgrade Areas

3.4.1.3 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 one-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. Evaluating development in a floodplain is necessary to ensure that the Project is consistent with EO 11988, Floodplain Management and local floodplain development regulations.

3.4.1.3.1 Project Site

Based on Lawrence County Flood Insurance Rate Map Panels 01079C0120D, 01079C0139D, and 01079C0140D, approximately 788 acres and 25 acres of the Project Site are within the Federal Emergency Management Agency (FEMA)-identified 100-year and 500-year floodplains, respectively (; FEMA 2024).

3.4.1.3.2 TL Upgrade Areas

Based on Lawrence County Flood Insurance Rate Map Panels 01079C0020D, 01079C0040D, 01079C0105C, 01079C0110D, 01079C0120D, and 01079C0140D, approximately 3.7 acres of the TL Upgrade Areas are within the FEMA-identified 100-year floodplain (Figure 3-17, Figure 3-18, FEMA 2024).

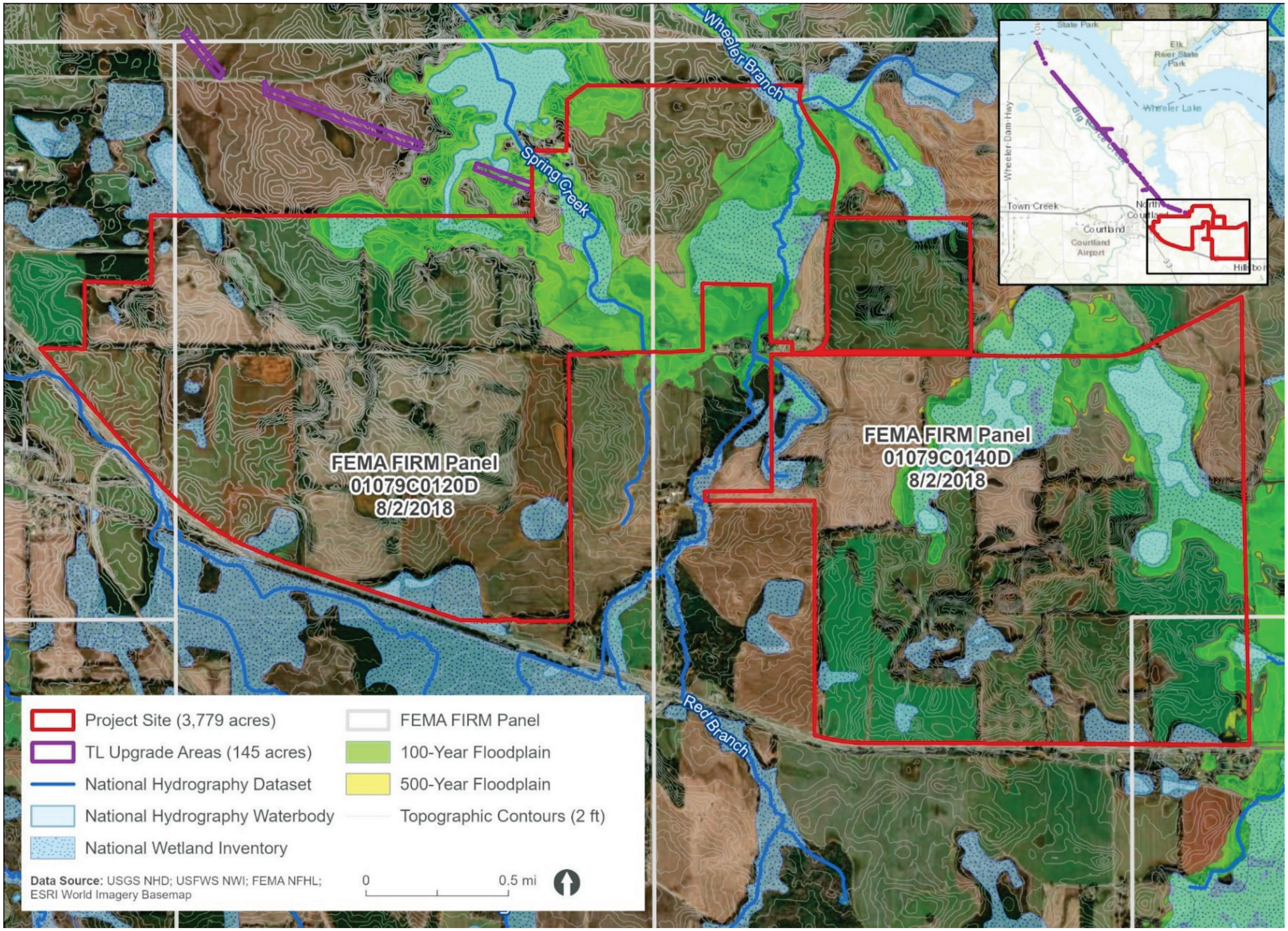

Figure 3-17. National Hydrography Dataset, National Wetland Inventory, and FEMA flood zones in the Project Site vicinity

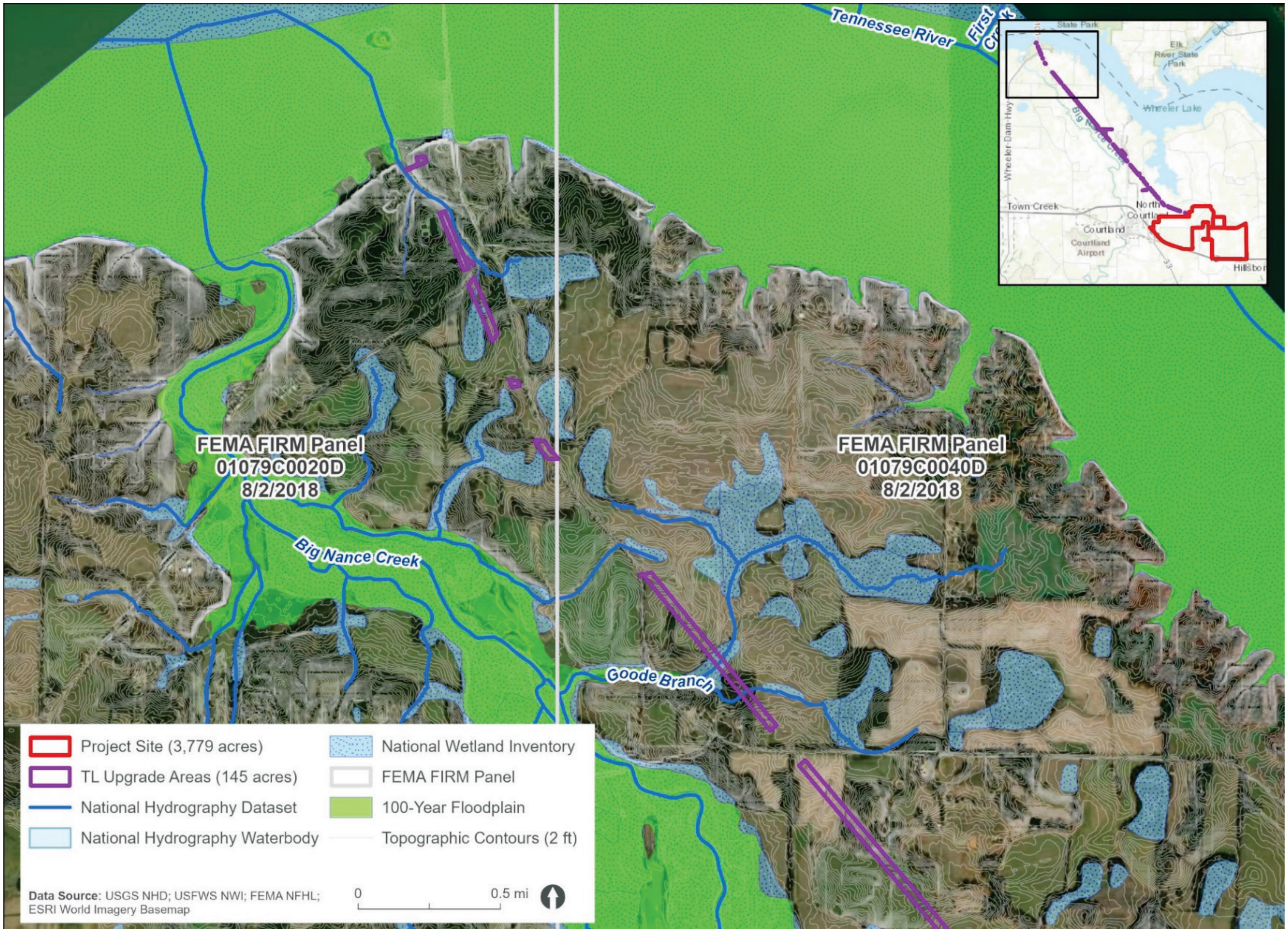

Figure 3-18. National Hydrography Dataset, National Wetland Inventory, and FEMA flood zones in the vicinity of the northern portion of the TL Upgrade Areas

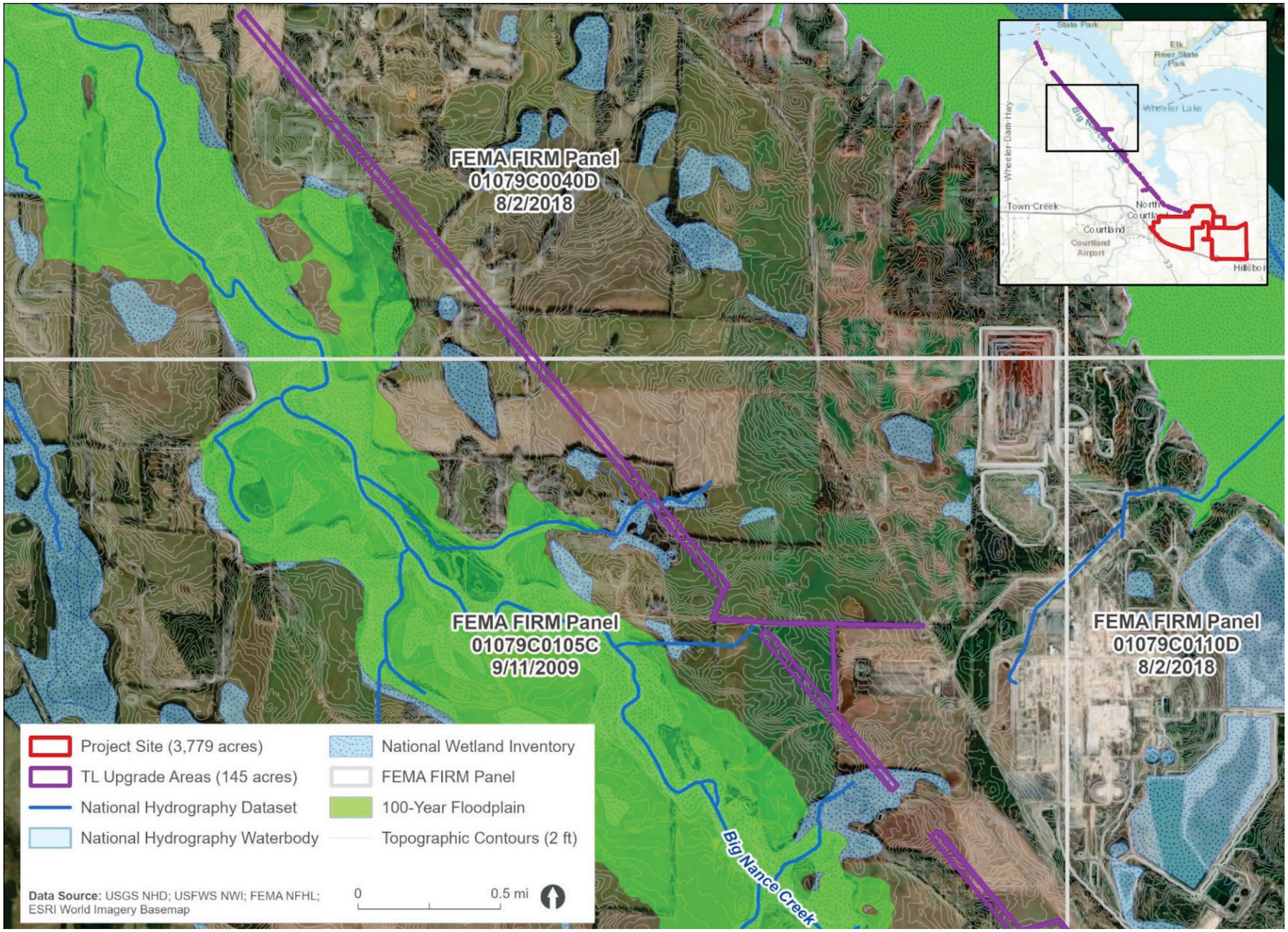

Figure 3-19. National Hydrography Dataset, National Wetland Inventory, and FEMA flood zones in the vicinity of the central portion of the TL Upgrade Areas

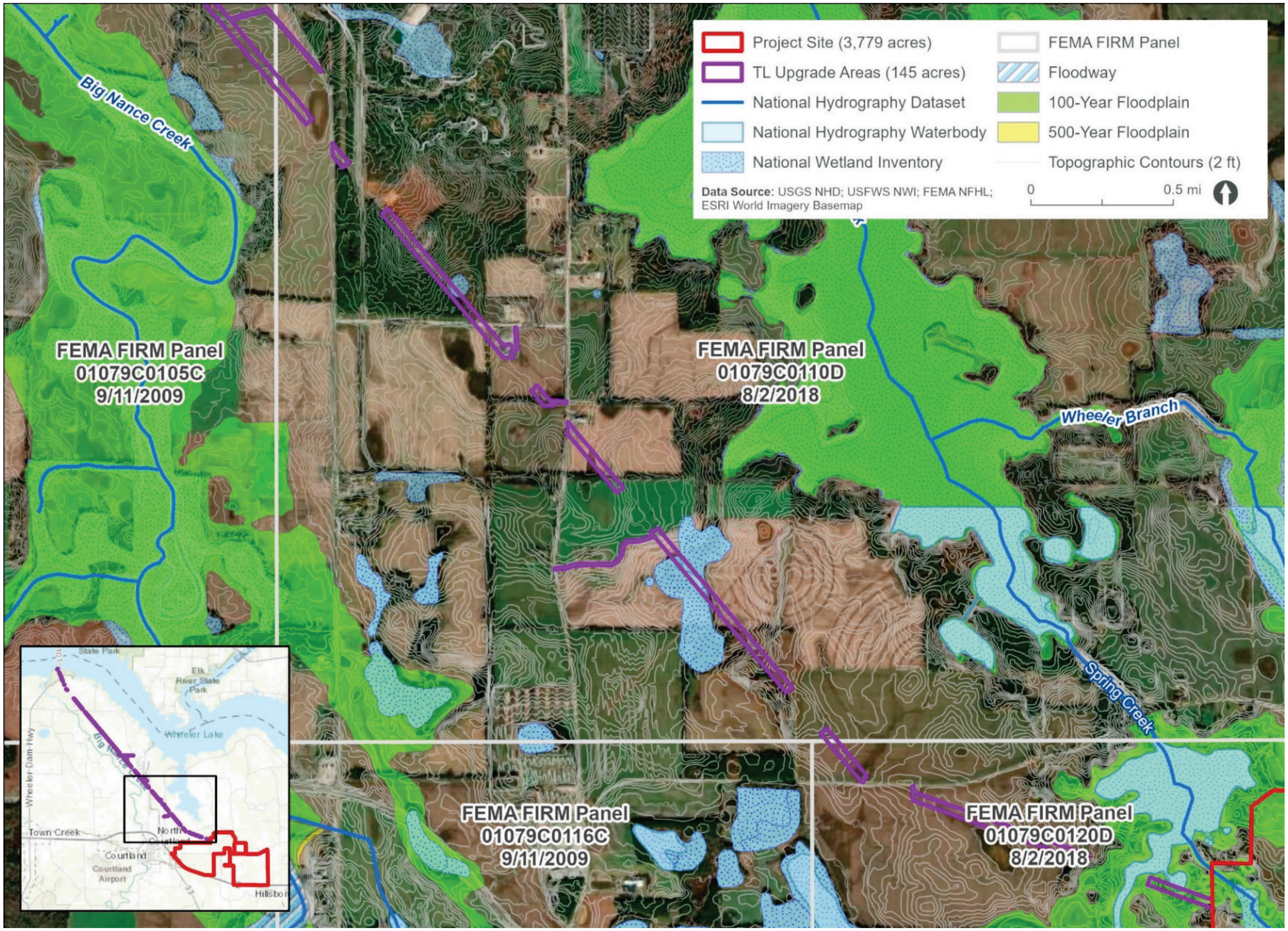

Figure 3-20. National Hydrography Dataset, National Wetland Inventory, and FEMA flood zones in the vicinity of the southern portion of the TL Upgrade Areas

3.4.1.4 Water Quality

The CWA requires all states to identify all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards and to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. States are required to submit reports to USEPA with these data. The term "303(d) list" refers to the list of impaired and threatened streams and water bodies identified by the state. Table 3-12 provides a listing of local streams with their state designated uses (ADEM 2022a, 2022b).

Table 3-12. Streams in the Project vicinity and their uses

Stream	Use Classification[a]		
	PWS	S	F&W
Tennessee River (Wheeler/Wilson Reservoirs)[b]	X	X	X
Spring Creek	X	X	X
Red Branch[b]			X
Wheeler Branch			X
Prairie Creek[b]			X
Mallard Creek[b]			X
Swoope Branch[b]			X
Big Nance Creek[b]			X
Goode Branch			X

Sources: ADEM 2022a; ADEM 2022b

[a] Codes: PWS = Public Water Supply; S = Swimming and Other Whole Body Water Contact Sports; F&W = Fish and Wildlife

[b] Stream in the Project vicinity, but not on the Project Site or TL Upgrade Areas.

3.4.1.4.1 Project Site

No streams on the Project Site are currently listed as impaired. Of the streams in the Project vicinity, Big Nance Creek is listed as impaired for metals (mercury) caused by atmospheric deposition (ADEM 2022a, 2022b).

3.4.1.4.2 TL Upgrade Areas

No streams within the TL Upgrade Areas are currently listed as impaired. Of the streams in the vicinity of the TL Upgrade Areas, Big Nance Creek is listed as impaired for metals (mercury) caused by atmospheric deposition and the Wheeler Reservoir and Wilson Reservoir portions of the Tennessee River are listed as impaired for nutrients due to agricultural causes and perfluorooctane sulfonate due to industrial causes (ADEM 2022a, 2022b).

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; therefore, no direct Project-related impacts to water resources would likely occur. Existing land use would likely remain primarily agricultural land for the foreseeable future, and water resources would remain as they are at the present time. Indirect impacts to water resources could occur due to continuing agricultural use of the Project Site. Erosion and sedimentation on-site could alter runoff patterns on the Project Site and impact downstream surface water quality. In addition, if the local aquifers are recharged from surface water runoff, chemical fertilizer and pesticide use could impact both the surface water and groundwater.

3.4.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, minor direct impacts to streams and wetlands would result from construction and operation of the Project.

3.4.2.2.1 Groundwater

3.4.2.2.1.1 Project Site

Under the Proposed Action Alternative, minor direct impacts to groundwater quality would result from the construction of the Project and minimal impacts would occur during operations.

No direct adverse impacts to groundwater are anticipated as a result of the Proposed Action. The PV panels would have little effect on groundwater infiltration and surface water runoff because rainwater would drain off the panels to the adjacent vegetated ground. Array spacing and panel movement throughout the day would minimize rain shadow effects.

Hazardous materials that could contaminate groundwater would be stored on the Project Site during construction. The limited use of petroleum fuels, lubricants, and hydraulic fluids during construction and by maintenance vehicles would result in a low potential for small on-site spills. However, the use of BMPs to properly maintain vehicles to avoid leaks and spills, implementation of a Spill Prevention, Control, and Countermeasure (SPCC) plan, and procedures to immediately address spills that did occur, would minimize the potential for adverse impacts to groundwater.

Project activities could cause erosion during construction resulting in the movement of sediment into groundwater infiltration zones. BMPs, such as those described in TVA's BMP manual (TVA 2022a) would be used to avoid contamination of groundwater due to Project activities. However, once construction is complete and disturbed areas are revegetated, including up to 50 acres of species-rich native plant meadows, future erosion would be minimized.

Fertilizers and pesticides would be used sparingly during construction and revegetation, in accordance with manufacturer's recommendations to avoid contamination of groundwater. While maintenance of species-rich native plant meadows would include selective herbicide applications, these would be reduced in comparison with the existing agricultural practices on the Project Site. Once revegetated, the need for future fertilizers and pesticides would be limited.

3.4.2.2.1.1.1 Construction-related Water Needs

Water and sewer services are anticipated to be needed during construction of the Project. Construction-related water use would support site preparation and grading activities. The primary use of water would be for compaction and dust control during grading and earthwork. Smaller quantities of water would be required for other minor uses.

Water used during construction would be provided by new on-site wells and/or delivery via water trucks. If required, water-based drilling muds would be collected and dewatered, with runoff occurring locally into nearby field areas. Dewatered muds would be non-toxic and could be distributed as subsoil during site grading. Sewer services would be provided via portable toilets. Due to the capacity of the Tuscumbia-Fort Payne aquifer, the proposed options for water and water-related needs would not adversely affect available groundwater resources, including the existing on-site well.

3.4.2.2.1.1.2 Operation- and Maintenance-related Water Needs
The primary uses of water during operation and maintenance would be for dust control and equipment washing. Internal access roads would be lightly traveled during normal operation, and consequently, water use for dust control is anticipated to be limited if at all necessary. Precipitation in the area is adequate to limit buildup of dust and other matter on the PV panels that would reduce energy production; therefore, no regular panel washing is anticipated. The panels would be cleaned if a specific issue was identified or depending on the frequency of rainfall, proximity of arrays to sources of airborne particulates, and other factors.

Equipment washing and potential dust control discharges would be handled in accordance with BMPs for water-only cleaning. Water needs during operation and maintenance would be provided via on-site wells or by delivery via water trucks and would not adversely affect groundwater resources.

3.4.2.2.1.1.3 Decommissioning- and Site Reclamation-related Water and Wastewater Needs
Conditions may change by the time facility closure and decommissioning becomes necessary. A final Decommissioning and Closure Plan would be created based on site conditions at the time of facility closure.

The Project would comply with NPDES requirements by preparing and implementing a CBMPP and filing a Notice of Intent to comply with the General Construction Stormwater NPDES Permit. The plan would include procedures to be followed during decommissioning to prevent erosion and sedimentation, non-stormwater discharges, and contact between stormwater and potentially polluting substances.

Decommissioning and site reclamation would likely be staged in phases, allowing for a minimal amount of disturbance and requiring minimal dust control and water usage. Water usage during decommissioning and site reclamation is not anticipated to exceed construction or operational water usage.

3.4.2.2.1.2 TL Upgrade Areas

3.4.2.2.1.2.1 Construction-related Water Needs
Shallow excavation may be required for the TL upgrade activities. If groundwater is encountered, dewatering activities, similar to methods described in Section 3.4.2.2.1.1.1, would be used to control groundwater infiltration into the excavation site and all state and federal requirements relating to groundwater protection would be followed. If dewatering is required, TVA would utilize filter bags and BMPs prior to discharging water. Since dewatering would only occur if groundwater were interfering with excavation and construction activities, the overall impacts to groundwater would be localized, minor, and temporary. Dewatering would only be performed to the extent that groundwater is locally lowered within the active construction footprint of the TL Upgrade Areas from the surrounding areas; therefore, no adverse impacts to groundwater would be anticipated.

3.4.2.2.1.2.2 Operation- and Maintenance-related Water Needs
During revegetation and maintenance activities, impacts to groundwater would be negligible given the nature of the activities. Revegetation of the access road areas would require the

seeding and initial watering of construction workspaces. The primary uses of water during operation and maintenance would be for dust control and infrequent panel washing. Panel washing and any potential dust control discharges would be handled in accordance with BMPs for water-only cleaning. Water needs during operation and maintenance would be provided via on-site wells or by delivery via water trucks and would not adversely affect groundwater resources.

3.4.2.2.1.3 Overall Groundwater Impacts

Due to the small volume of groundwater anticipated to be needed for the Project, impacts to the local aquifers and groundwater in general are not anticipated. The use of BMPs and a CBMPP would reduce the possibility of on-site hazardous materials reaching the groundwater during operation or maintenance. Overall, impacts to groundwater would not be anticipated.

Indirect beneficial impacts to groundwater could occur if panel placement and/or the use of SMZs lead to fewer pollutants and erosion products entering groundwater. Currently, most of the on-site land use is agricultural, which can result in fertilizer and pesticide runoff and percolation into the groundwater. The construction and operation of the Proposed Action would reduce or eliminate the use of fertilizer and pesticides, resulting in a beneficial, though minor, indirect impact to groundwater.

3.4.2.2.1.4 Cumulative Impacts

The slight increase in impervious surface resulting from development of the solar facility may inhibit groundwater infiltration and recharge to the local aquifer. Any change would be minor with little effect on groundwater quantity or quality. Due to the small areas that would change as a result of the Project, present actions, and RFFAs, cumulative impacts of past, present, and RFFAs, including the Proposed Action, on groundwater would likely be minor.

3.4.2.2.2 Surface Water

3.4.2.2.2.1 Project Site

Under the Proposed Action Alternative, direct impacts to some surface waters would be permanent while others would be temporary and minor due to the use of BMPs such as maintenance of SMZs around perennial and intermittent streams and wetlands and implementation of erosion control measures to minimize sediment runoff during construction. Figure 3-21 illustrates stream and wetland locations relative to Project components. During the facility design process, impacts to on-site surface waters would be avoided to the extent practicable and compensatory mitigation would be purchased as necessary; therefore, this Project is consistent with the requirements of EO 11990, Protection of Wetlands. Site design would ensure adequate routing of stormwater flows and retention to minimize downstream impacts.

However, complete avoidance of surface waters is not feasible, and the construction and operation of the Project would permanently affect 1,349 LF of four WWCs (E001, E002, E019, E020) due to the proposed installation of solar arrays and three access road crossings (Figure 3-21). While these waters would be permanently affected, they are non-jurisdictional features and provide very little flow to the perennial and intermittent streams during rain events. Access road crossing over three WWCs (E001, E002, E019) would result in temporary impacts during road construction and permanent impacts due to road placement. Impacts caused by the construction of Project components to WWCs would entail piling placement and grading where necessary for solar array or central inverter installation but would not require CWA Section 404/401 permitting. Hillsboro Solar, LLC would obtain the necessary permit(s) before construction begins and would follow the permit requirements, and necessary mitigation, to minimize impacts to wetlands and/or streams. Additionally, with the implementation of appropriate TVA BMPs such as the 70-foot SMZ around Wheeler Branch and 50-foot SMZs around other streams and BMPs in accordance with the site CBMPP, indirect impacts to wetlands and streams would be further minimized during construction.

Construction equipment would avoid crossing streams to the maximum extent practicable. However, if necessary, temporary stream crossings would be utilized with adherence to BMPs to minimize impacts to stream banks and channels and be considered under the appropriate CWA Section 404/401 permits as needed. Vegetation clearing at stream crossings would be minimized to the maximum extent practicable. Surface water impacts to potentially jurisdictional waters are not anticipated from the installation of electrical cables due to the use of underground installation by boring or by attaching overhead cables to poles. If underground installation is chosen as the method of installation, the Project would pursue permitting as necessary. Appropriate BMPs would be implemented during construction and operation of the Project. If required, mitigation would be purchased to offset impacts for these features.

Wetlands and associated SMZs located on the Project Site would be subject to hand clearing while leaving stumps in place if deemed necessary to reduce shading of the solar panels. Permanent impacts to 1.62 acre of five forested wetlands (W001, W002a, W003, W005b, W017) within the 200-foot-wide area surrounding proposed panel locations would be caused by clearing to reduce solar panel shading (Table 3-13, Figure 3-21). W001 and W003 are presumed non-jurisdictional features and provide very little connection to other hydrologic features on the landscape. These wetlands would be permanently impacted by conversion from forested wetlands to emergent wetlands. While this would not eliminate wetland habitat, some wetland functions would be reduced due to the change in the vegetation community. TVA BMPs, such as 50-foot SMZs would be maintained to provide an adequate upland vegetative buffer to further sustain adjacent wetland functions. Indirect impacts would be avoided to the extent practicable through the implementation of an erosion control plan and measures, such as silt fencing, to prevent sedimentation in wetlands during construction. Appropriate permits including the CWA Section 404 Individual or General NWP and Individual or General ARAP would be applied to as jurisdictional WOTUS and state-regulated waters are confirmed. If further impacts to wetlands are identified, the Project would apply for CWA Section 404 permitting up to Individual Permitting as necessary. If required, compensatory mitigation would be purchased to offset impacts to these wetlands. Appropriate BMPs would be implemented during construction and operation of the Project. Thus, the Project would result in minor impacts to wetlands.

Table 3-13. 200-foot shading buffer wetland impacts within the Project Site

Feature Identifier	Type	TVARAM Functional Capacity (Score)	Proposed Impacts		Impact (acres)
			Duration	Type	
W001	PFO	Moderate (42)	Permanent	Conversion	0.77
W002a	PFO	Superior (61)	Permanent	Conversion	0.06
W003	PFO	Moderate (54)	Permanent	Conversion	0.37
W005b	PFO	Moderate (41)	Permanent	Conversion	0.06
W017	PFO	Superior (60)	Permanent	Conversion	0.36
			Permanent Impacts (acres)		**1.62**

Hillsboro Solar, LLC would submit an approved jurisdictional determination request to USACE and obtain the necessary permit(s), before construction begins, and would follow the permit requirements and mitigation measures to minimize impacts to wetlands.

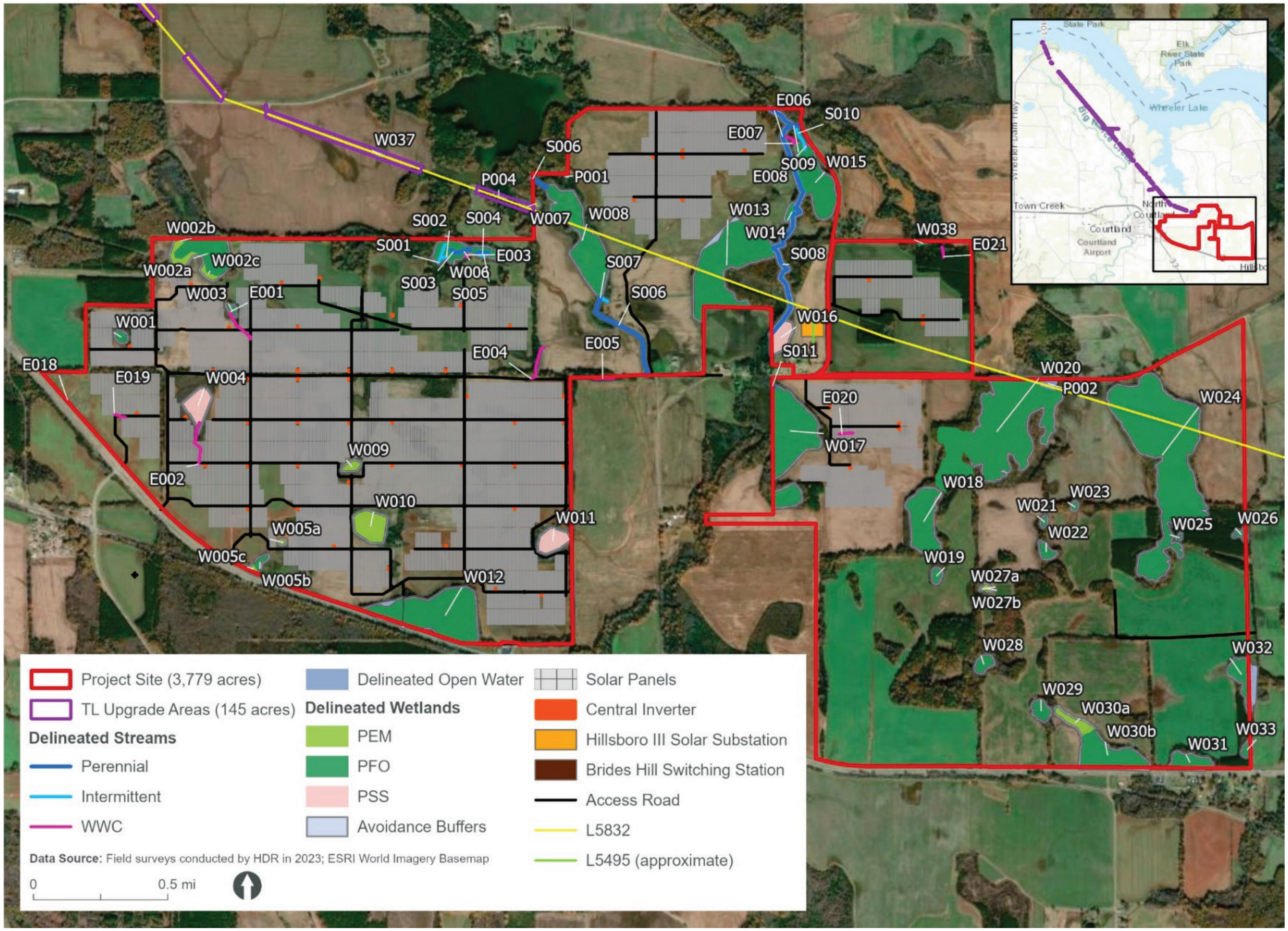

Figure 3-21. Proposed Project components in relation to delineated streams, wetlands, and open waters on the Project Site

3.4.2.2.2.2 TL Upgrade Areas

TL upgrade activities necessary to interconnect the solar PV facility to TVA's existing electrical transmission network could result in stream and wetland impacts. The installation of OPGW would not require pole replacements along the existing ROW. TVA would install four new pole structures on the Project Site and replace one pole structure within the TL Upgrade Areas. No poles would be installed within the 70-foot SMZ around Wheeler Branch and 50-foot SMZs around other streams and wetlands. Installation of OPGW would be performed either using ground equipment or by helicopter. Access across wetlands located in the ROW would be conducted in accordance with wetland BMPs to minimize soil compaction and ensure only temporary impacts result (TVA 2022a). This includes use of low ground pressure equipment, wetland mats, and dry season work scheduling. Permanent stream crossings that cannot be avoided would be designed to not impede runoff patterns and the natural movement of aquatic fauna and would comply with appropriate USACE permit requirements. Temporary stream crossings and other construction and maintenance activities associated with the TL upgrades would comply with appropriate state permit requirements and TVA requirements as described in TVA's BMP manual (TVA 2022a).

3.4.2.2.2.3 Cumulative Impacts

Direct, temporary impacts to surface waters due to proposed construction activities would occur and impacts would be mitigated with the use of BMPs and installation of sediment and erosion control measures. Due to the avoidance of permanent impacts to aquatic resources that exhibit functional habitat and flow patterns and accommodations for long term stormwater management for this Project and the small areas that would change as a result of the present actions and RFFAs, cumulative impacts of past, present, and RFFAs, including the Proposed Action, on surface waters would likely be minor.

3.4.2.2.3 Floodplains

3.4.2.2.3.1 Project Site

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 the 100-year floodplain unless there is no practicable alternative. Additionally, the Project would comply with Lawrence County's floodplain ordinance.

The solar facility components, Hillsboro III Solar substation, and Bride's Hill switching station would be located outside the FEMA-identified 100-year floodplain (Figure 3-22). Therefore, the Project would be consistent with EO 11988, and no impacts to floodplains and their natural and beneficial values would occur.

3.4.2.2.3.2 TL Upgrade Areas

No access roads would occur in the 100-year floodplain and OPGW would be installed near the tops of TL structures, well above the 100-year elevation. Two new TL pole structures would be constructed, and a tower extension would be added to one TL structure in the 100-year floodplain. These activities are considered repetitive actions in the 100-year floodplain and would result in minor adverse impacts (TVA 1981). With implementation of mitigation measures, which would also serve to minimize adverse impacts, the Project would be consistent with EO 11988 and have no significant impacts to floodplains and their natural and beneficial values.

3.4.2.2.3.3 Cumulative Impacts

Because the Project would not adversely affect floodplains, the Proposed Action would not result in cumulative impacts to floodplains and their natural and beneficial values.

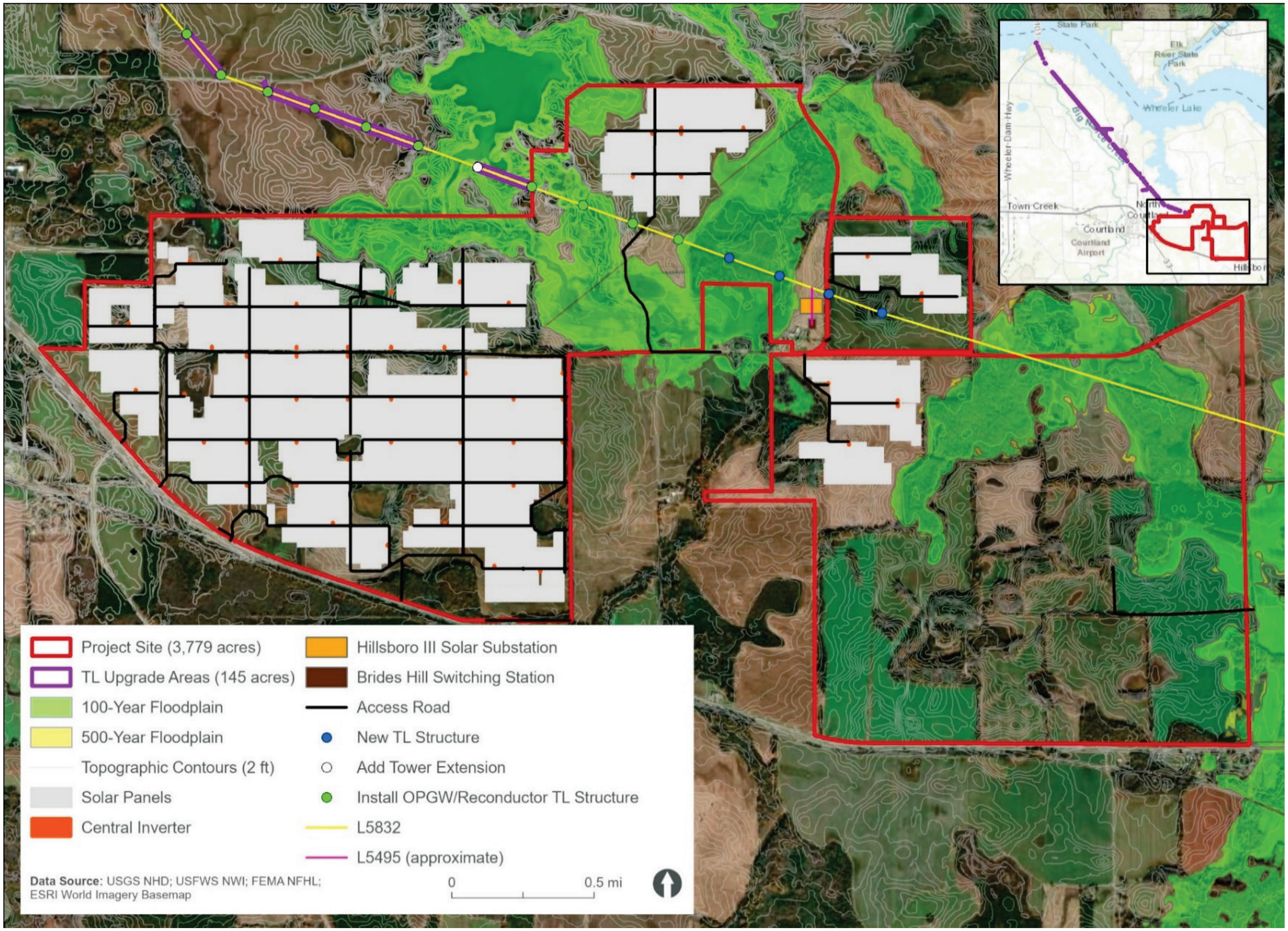

Figure 3-22. Proposed Project components in relation to floodplains in the Project Site

3.4.2.2.4 Water Quality

3.4.2.2.4.1 Project Site

Soil disturbances associated with Project construction activities can result in adverse water quality impacts. Soil erosion and sedimentation can impact surface water quality. Construction activities would be performed using BMPs to minimize these impacts. Hillsboro Solar, LLC would comply with all appropriate local, state, and federal permit requirements. All proposed Project activities would be conducted in a manner to ensure that waste materials are contained, and that the introduction of pollutants to the receiving waters would be adequately minimized and in compliance with water quality regulations.

As shown in Table 1-2, a CWA Section 402 NPDES Construction Stormwater General Permit would be needed since more than one acre would be disturbed for the Project. The permit also requires the development and implementation of a CBMPP. In addition, either CWA NWP(s) or an Individual Permit would be required from USACE and CWA Section 401 Water Quality Certifications from ADEM for road crossings and other water feature disturbances affecting WOTUS, including perennial and intermittent streams and wetlands. TVA is also subject to EO 11990, Protection for Wetlands. EO 11990 requires federal agencies to avoid wetland impacts to the extent practicable; minimize wetland destruction, loss, or degradation; and preserve and enhance natural and beneficial wetland values while carrying out agency responsibilities. EO 11990 further states that unavoidable impacts to streams and wetlands should be compensated through a process known as compensatory mitigation. BMPs, as described in TVA's BMP manual (TVA 2022a), would be used to avoid contamination of surface water on and downstream of the Project Site. The use of BMPs for controlling soil erosion and runoff would minimize these potential impacts to surface water. Additionally, construction of on-site stormwater detention basins would allow sediment to settle out prior to release.

3.4.2.2.4.2 TL Upgrade Areas

Potential impacts and mitigation measures on water quality are similar to what is described for the Project Site in Section 3.4.2.2.5.1.

3.4.2.2.4.3 Cumulative Impacts

Construction activities associated with the RFFAs such as the adjacent North Alabama Utility-Scale Solar Facility and development of the industrial parks, together with the Proposed Action, would result in minor adverse cumulative impacts on water quality due to increases in soil erosion and sedimentation. Similar to the Project, the past, present, and RFFAs are subject to CWA jurisdiction, ensuring current and foreseeable water quality impacts are considered, permitted, and/or mitigated in accordance with federal and state regulations. Cumulative impacts are considered in the CWA permitting process to ensure individual waterbody impacts do not collectively result in degradation to WOTUS. Due to implementation of BMPs and adherence to federal and state regulations, permitting, and mitigation; the Project is not anticipated to contribute to cumulative adverse impacts to water quality.

3.5 Biological Resources

3.5.1 Affected Environment

The Project Site is in the Eastern Highland Rim section of the Interior Low Plateaus physiographic province and is primarily underlain by carbonate bedrock of the Mississippian Period. Calcareous subsurface geology in the region surrounding the Project Site can result in karst features including springs, sinks, and caves (Griffith et al. 2001). The natural plant communities in this ecoregion are transitional between the oak-hickory forest that predominates to the west and the mixed mesophytic forest that predominates to the east. In the Project Site, the Eastern Highland Rim typically exhibits deep soils that support intensive row crop agriculture. These areas are heavily disturbed by past and present agricultural land uses.

Field surveys were conducted by HDR environmental scientists in August 2023, October 2023, and March 2024, and by HDR's consulting botanist in March 2024 to identify vegetation and wildlife and verify whether habitat for rare, threatened, or endangered species occurs on the Project Site and TL Upgrade Areas (Appendix B). Results of the background research and habitat assessments are described in this section.

3.5.1.1 Vegetation

Vegetation in the form of trees, shrubs, vines, and herbaceous cover provides habitat and food resources for birds, mammals, reptiles, amphibians, and insects. Vegetation also supports soil and nutrient cycles and provides ecosystem services, such as food, fresh water, fuel, fiber, and medicines to human populations (Michigan State University n.d.). The federal Plant Protection Act of 2000 consolidated previous legislation and authorized USDA to issue regulations to prevent the introduction and movement of identified plant pests and noxious weeds. EO 13112—Invasive Species directs federal agencies to prevent the introduction of invasive species (both plants and animals), control their populations, restore invaded ecosystems, and take other related actions. EO 13751—Safeguarding the Nation from the Effects of Invasive Species amends EO 13112 and directs federal agencies to continue coordinated federal prevention and control efforts related to invasive species. Agencies are also directed to incorporate consideration of human and environmental health, climate change, technological innovation, and other emerging priorities into their efforts to address invasive species (USDA 2018).

3.5.1.1.1 Project Site

Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys consist of agricultural fields/cropland, mixed wet deciduous forest, mixed dry deciduous forest, clearcut forest, and evergreen forest. The plant communities observed on the Project Site are common and well represented throughout the region. The structure and species composition of forest stands on the Project Site varies, but none had the structural characteristics indicative of old growth forest (Bureau of Land Management 2024). Factors like soils, slope, and landscape help determine the type of forest present, but previous land use is an important factor determining the number and type of species a forest stand supports. The forest stands present on the Project Site are heavily disturbed by human activities and contain a large proportion of invasive species.

Agricultural fields, including pasture and hay fields, with forested edges and clearcut areas comprise approximately 2,945 acres (78 percent) of the Project Site. Current management activities on the Project Site are focused on production of soybean, cotton, and corn. Plant species found along the edges of the agricultural fields include common pioneering species such as broomsedge, fleabane, pigweed, clover, Chinese bushclover, and foxtail grass. Forested areas comprise the remaining approximately 834 acres (22 percent) of the Project Site. Old growth forests were not documented as occurring within the Project Site. The plant communities observed on the Project Site are common and well represented throughout the region.

Mixed wet deciduous forests comprising approximately 474 acres (13 percent) of the Project Site are scattered throughout the Project Site with larger stands occurring in the northern, central, and eastern portions and smaller stands at the southern boundary of the Project Site along US 72A/SR 20. Several of these stands of mixed wet deciduous forest are also classified as wetlands. Common canopy species include swamp tupelo, black gum, sweetgum, loblolly pine, green ash, American sycamore, red maple, water oak, willow oak, and ironwood. Average diameter at breast height (DBH) of canopy species in these forest areas is approximately 14 inches. Understory plants include green ash, blackberries, poison ivy, Japanese stiltgrass, catbriar, and sedges.

Mixed dry deciduous forests comprising approximately 321 acres (nine percent) of the Project Site are present in the northwestern and eastern portions of the Project Site. Common canopy species include southern red oak, white oak, post oak, common hackberry, sugar hackberry, loblolly pine, sugar maple, green ash, American beech, and eastern red cedar. Average DBH of canopy species in these forest areas is approximately 18 inches. Understory plants present consisted of southern red oak, green ash, Chinese privet, blackberries, Virginia creeper, summer grape, muscadine, wintergreen, poison ivy, Japanese honeysuckle, trumpet vine, catbriar, sedges, and other unidentified grass species.

A single stand of evergreen forest comprising approximately 38 acres (one percent) of the Project Site is present along the eastern border of the Project Site. Loblolly pine is the dominant canopy species in this vegetation community with an average DBH of approximately 18 inches. Understory plants included pepper vine, Japanese stilt grass, Virginia creeper, catbriar, and poison ivy.

Forested areas recently harvested by clearcutting account for approximately 184 acres (five percent) of the Project Site and occur in the southwest portion of the Project Site. Revegetation in these areas primarily consists of early successional and scrub-shrub plant communities. Plant species observed included saplings of red maple and sassafras, trumpet vine, Japanese honeysuckle, broomsedge, blackberries, Chinese bushclover, sumac, ironweed, giant goldenrod, pokeweed, autumn olive, horseweed, common thistle, and corn salad. Average DBH of occasional small canopy species in these forest areas is approximately seven inches.

Table 3-14 provides a summary of the vegetation community types with two of the community types occupying less than five percent of the Project Site. Figure 3-23 displays the locations of the vegetation communities on the Project Site. See Appendix B for further information.

Table 3-14. Vegetation communities on the Project Site

Plant Community	Area (acres)	% Project Site
Agricultural Fields/Cropland/Maintained Lawn	2,761	73
Mixed Wet Deciduous Forest	474	13
Mixed Dry Deciduous Forest	321	9
Clearcut Forest[1]	184	5
Evergreen Forest	38	1
Total	**3,779**	**100**

[1] Not defined as a vegetation community under Grossman et al. (1998)

3.5.1.1.1.1 Federal Noxious Weeds and Non-Native and Invasive Plants

Noxious weeds are defined as any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the U.S., the public heath, or the environment (USDA 2023b). USDA maintains a list of federally recognized noxious weeds (USDA 2010, 2012). No federally noxious weeds were observed on the Project Site during field surveys.

Eleven non-native plant species were documented on the Project Site, including Japanese honeysuckle, Chinese bushclover, autumn olive, Johnson grass, Chinese privet, Japanese stiltgrass, white clover, ryegrass, burweed, paper mulberry, and periwinkle. Japanese honeysuckle, Chinese privet, and Japanese stiltgrass are on the Alabama Invasive Plant Council (2012) list of invasive plants. These species are most often found in ruderal forested areas, along field edges, and in areas prone to disturbance (edges of agricultural fields). Invasive plants were found in forested areas. Non-natives were abundant in the northwestern, northeastern, and eastern portions of the Project Site, and were minimal in the southwest and north-central areas of the Project Site.

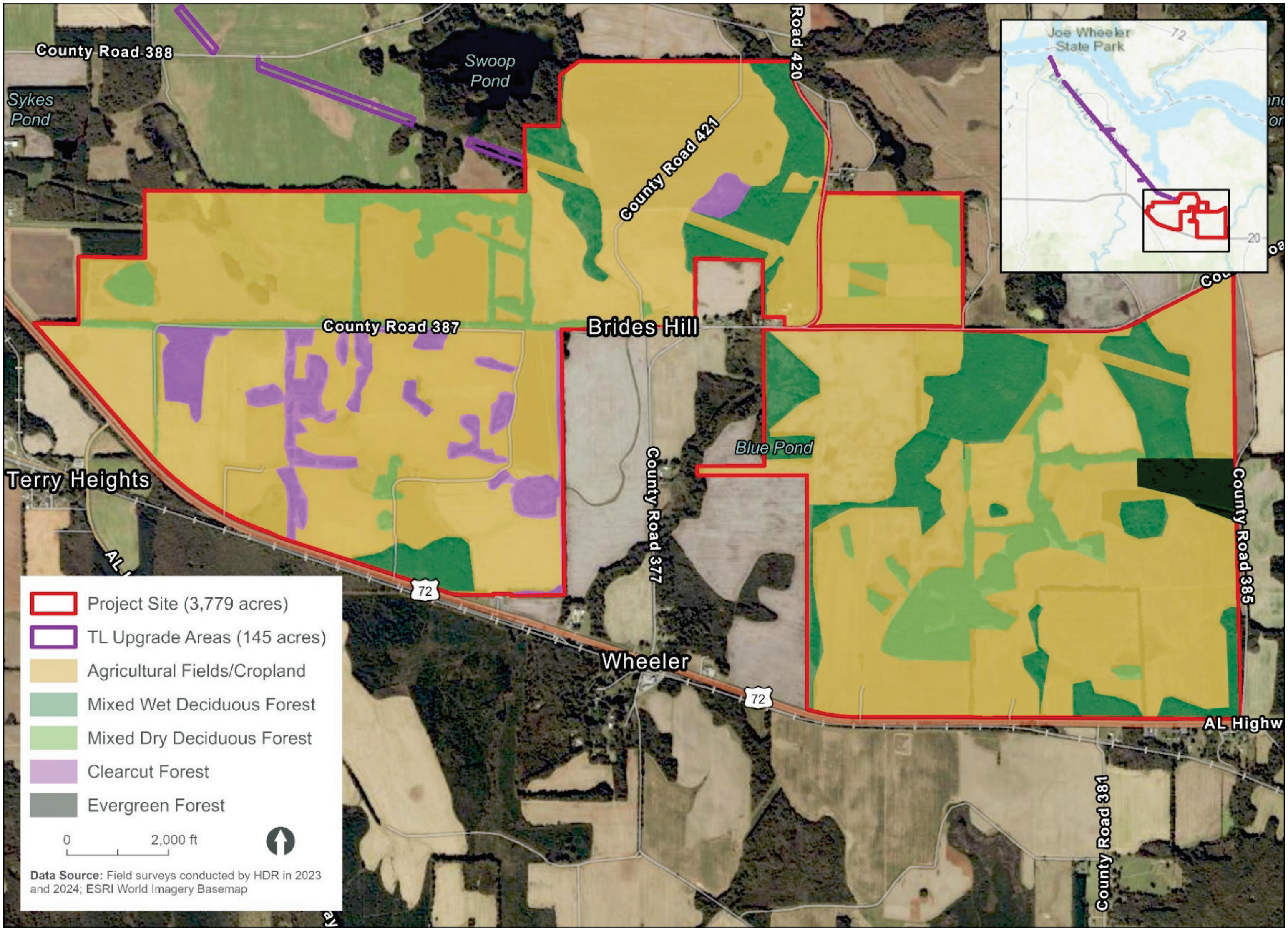

Figure 3-23. Vegetation communities on the Project Site

3.5.1.1.2 TL Upgrade Areas

Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys consist of agricultural fields/cropland, open pasture, and maintained lawn. The plant communities observed on the TL Upgrade Areas are common and well represented throughout the region.

Agricultural fields and maintained lawns with forested edges comprise approximately 136 acres (94 percent) of the TL Upgrade Areas. Current management activities on the TL Upgrade Areas are focused on production of soybean, cotton, and corn. Some portions of the agricultural field are currently used for cattle grazing. Typical herbaceous species observed in this vegetation community include little bluestem, green foxtail grass, Lindheimer's doveweed, ryegrass, Chinese bushclover, white clover, buttercup species, ironweed, switchgrass, dog fennel, smartweed, sneezeweed, partridge pea, panic grass species, burweed, and American elderberry. Maintained lawns within the TL Upgrade Areas contain typical herbaceous species such as pokeweed, Johnson grass, passion flower, giant goldenrod, common boneset, Chinese bushclover, ironweed, tall ragweed, daisy fleabane, cat brier, wingstem, blackberries, Japanese honeysuckle, switchgrass, and smooth alder seedlings.

Table 3-15. Vegetation communities within the TL Upgrade Areas

Plant Community	Area (acres)	% TL Upgrade Areas
Agricultural Fields/Cropland/Maintained Lawn	136	94
Total[1]	**146**	**100**

[1] Total varies slightly due to rounding and 10 acres of the TL Upgrade Area being industrial land.

3.5.1.1.2.1 Federal Noxious Weeds and Non-Native and Invasive Plants

The federal noxious weeds and non-native and invasive plants associated with the TL Upgrade Areas is generally the same as described for the Project Site in Section 3.5.1.1.1.1.

3.5.1.2 Wildlife

Pedestrian surveys of the Project Site and TL Upgrade Areas for terrestrial wildlife were conducted simultaneously with the vegetation surveys in August 2023, October 2023, and March 2024. Table 3-16 includes a list of species that were either directly observed on the Project Site and TL Upgrade Areas or whose evidence (i.e., tracks, scat, remains, burrows) was identified during the field survey. Additional details on field observations are provided in Appendix B.

3.5.1.2.1 Project Site

Vegetation communities described in the prior section provide suitable habitat for many common wildlife inhabiting the region, both seasonally and year-round. Most of the Project Site is agricultural fields/cropland. Actively cultivated fields provide habitat for a limited number of common wildlife species. Fields left fallow provide habitat for a wider range of species. Common inhabitants of croplands include killdeer, brown-headed cowbird, American kestrel, eastern bluebird, eastern kingbird, eastern meadowlark, field sparrow, grasshopper sparrow, and red-tailed hawk (National Geographic 2002). Bobcat, coyote, eastern cottontail, hispid cotton rat, and red fox are mammals typical of fields and cultivated land (Whitaker 1996). Amphibians such as eastern narrow-mouthed toad and reptiles including black racer, ring-necked snake, and eastern black kingsnake are also known to occur in this habitat type (Powell et al. 2016; Bailey et al. 2006; Gibbons and Dorcas 2005).

Forested vegetation communities offer habitats to bird species such as the Acadian flycatcher, American goldfinch, American robin, barred owl, blue-gray gnatcatcher, blue jay, brown thrasher, Carolina wren, eastern phoebe, eastern towhee, eastern wood pewee, gray catbird, northern cardinal, pine warbler, red-bellied woodpecker, red-eyed vireo, red-shouldered hawk, ruby throated hummingbird, scarlet tanager, summer tanager (National Geographic 2002). Mammals with a potential to occur within forested areas include the common raccoon and white-tailed deer (Whitaker 1996). Reptiles with a potential to occur within forested areas include the eastern box turtle and gray rat snake (Powell et al. 2016; Bailey et al. 2006; Gibbons and Dorcas 2005).

Young regrowth in clearcut areas provide habitat for common birds, mammals, amphibians, and reptiles, as well as many insect pollinator species. Birds with a potential to occur in these areas include the black vulture, blue grosbeak, eastern bluebird, indigo bunting, northern mockingbird, and prairie warbler (National Geographic 2002). Mammals with a potential to occur in these areas include the bobcat, common raccoon, coyote, eastern chipmunk, eastern mole, groundhog, nine-banded armadillo, white-footed mouse, eastern deer mouse, and white-tailed deer (Whitaker 1996). Reptiles with a potential to occur in these areas include the corn snake, eastern kingsnake, and southern black racer (Gibbons and Dorcas 2005). A variety of species of bumblebee, common white-tailed dragonfly, and the common buckeye, hackberry emperor, pipevine swallowtail, and tiger swallowtail butterflies also have the potential to occur in these areas.

3.5.1.2.2 TL Upgrade Areas

The common wildlife and suitable habitat for common wildlife species associated with the TL Upgrade Areas are similar to what is described for the Project Site in Section 3.5.1.2.1.

Table 3-16. Common wildlife species observed on the Project Site and TL Upgrade Areas

Species Observed		Notes/Habitat Observed
Common Name	**Scientific Name**	
	Mammals	
White-tailed deer	*Odocoileus virginianus*	Observed on the edge of a corn field
	Birds	
Acadian flycatcher	*Empidonax virescens*	Observed and heard near forested and emergent wetlands
American crow	*Corvus brachyrhynchos*	Observed and heard flying between forested edges and agricultural fields
Baltimore oriole	*Icterus galbula*	Heard calling along forested tree line
Barred owl	*Strix varia*	Heard calling within a forested area
Black vulture	*Coragyps atratus*	Observed flying overhead on the Project Site
Carolina wren	*Thryothorus ludovicianus*	Observed and heard calling near agricultural field and forested edge
Eastern wood pewee	*Contopus virens*	Observed and heard calling within forested areas
Eastern towhee	*Pipilo erythrophthalmus*	Observed and heard calling within forested areas
Field sparrow	*Spizella pusilla*	Heard calling near agricultural field and forested edge
Gray catbird	*Dumetella carolinensis*	Heard calling near forested edge of Project Site
Great blue heron	*Ardea herodias*	Observed flying overhead and standing along open water

Species Observed		Notes/Habitat Observed
Common Name	**Scientific Name**	
Indigo bunting	*Passerina cyanea*	Observed flying between cotton field and forested edge
Mourning dove	*Zenaida macroura*	Observed on utility line over agricultural field
Northern cardinal	*Cardinalis cardinalis*	Observed and heard calling within forested edges of Project Site
Red-shouldered hawk	*Buteo lineatus*	Observed and heard flying overhead on the Project Site
Summer tanager	*Piranga rubra*	Observed and heard over and near forested wetland
Tufted titmouse	*Baeolophus bicolor*	Heard calling within forested areas of the Project Site
Great egret	*Ardea alba*	Observed within open water edge of Project Site
White-eyed vireo	*Vireo griseus*	Heard calling near forested edge and agricultural field
Wood thrush	*Hylocichla mustelina*	Heard calling within forested edge of agricultural field
Yellow warbler	*Setophaga petechia*	Observed flying within forested areas of Project Site
Reptiles		
Black racer	*Coluber constrictor*	Observed crossing through forested upland and agricultural field edge
Black rat snake	*Pantherophis obsoletus*	Observed crossing access road of Project Site
Copperhead	*Agkistrodon contortrix*	Observed within forested area and on access road of Project Site
Eastern cottonmouth	*Agkistrodon piscivorus*	Observed within forested wetland within Project Site
Insects		
Cicadas	*Cicadoidea*	Heard calling throughout the Project Site
Swallow tail butterfly	*Papilionidae*	Observed over cotton fields and near herbaceous edges of corn fields
Evidence (i.e., scat, tracks, remains, burrows)		
Coyote tracks/scat	*Canis latrans*	Observed along field edges on the Project Site
Nine-banded armadillo burrow	*Dasypus novemcintus*	Observed within several upland forested areas
Racoon tracks	*Procyon lotor*	Observed along stream banks throughout the Project Site
Osprey nests	*Pandion haliaetus*	Two nests observed on utility poles on the northwestern portion of the TL Upgrade Areas

3.5.1.3 Migratory Birds

EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to conserve migratory birds and implement the MBTA. The MBTA prohibits the “take” of migratory birds. The regulatory definition of “take” as defined by 50 CFR § 10.12, “means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue hunt, shoot, wound, kill, trap, capture, or collect.” The following prohibitions apply to migratory bird nests: “possession, sale, purchase, barter, transport, import and export, take, and collect.” The MBTA is executed and enforced by USFWS. In addition to protection under the MBTA, bald and golden eagles are also protected under BGEPA, which states that to kill, harass, and possess (without a permit), or sell bald and golden eagles and their parts is illegal.

3.5.1.3.1 Project Site

Approximately 285 birds have been identified in Lawrence County (eBird 2024), and additional species may occur regularly. USFWS maintains a list of migratory birds of conservation concern (USFWS 2021). These species are not listed under the ESA but are a high conservation priority of USFWS and without additional conservation action are likely to become candidates for listing under the ESA. Twenty-three species of birds of conservation concern are listed for Bird Conservation Region 24, Central Hardwoods, which encompasses the Project Site. Of these 23 species, at least 10 potentially occur with some regularity on or in the immediate vicinity of the Project Site based on habitat observed (Table 3-17).

Osprey typically build nests in trees and man-made structures (e.g., transmission structures) near or over shallow rivers, lakes, reservoirs, lagoons, swamps, and marshes (Cornell Lab of Ornithology 2024a). Nearly 400 observations of osprey have been made in Lawrence County (eBird 2024). In Alabama, osprey arrive in March to begin their breeding season, building nests and raising young from April through July. No nests were observed on the Project Site.

Bald eagles typically nest in forested areas adjacent to large bodies of water, avoiding heavily developed areas, and prefer to perch on tall, mature coniferous or deciduous trees that afford a wide view of the surroundings (Cornell Lab of Ornithology 2024b). Although bald eagles are frequently observed in Lawrence County (eBird 2024) and nest along Wheeler Reservoir, neither bald eagles nor their nests were sighted during the August 2023 and October 2023 field surveys, and suitable foraging and nesting habitat does not occur on the Project Site.

Golden eagles live in open and semi-open country, avoiding developed areas and interrupted stretches of forest, and nest on cliffs and steep escarpments in grassland, chapparal, shrubland, forest, and other vegetated areas (Cornell Lab of Ornithology 2024c). The golden eagle is a rare winter resident in Alabama and most reports of the species have been in the vicinity of reservoirs. One golden eagle has been reported from Lawrence County (eBird 2024) and the golden eagle is not likely to occur on the Project Site.

3.5.1.3.2 TL Upgrade Areas

The migratory birds associated with the TL Upgrade Areas are generally the same as described for the Project Site in Section 3.5.1.3.1. Two osprey nests were observed on utility poles on the northwestern portion of the TL Upgrade Areas.

Table 3-17. Migratory bird species of concern listed to occur on the Project Site and TL Upgrade Areas

Common Name	Scientific Name	General Habitat Description	Potential Habitat Present
Migrant Species (present as spring and fall migrant and/or during winter)			
Bobolink	*Dolichonyx oryzivorus*	Open country with a preference for large hayfields, moist meadows and weedy fields dominated by a mixture of tall grasses.	Yes
Lesser yellowlegs	*Tringa flavipes*	Mudflats, sandy beaches, shores of lakes and ponds, and wet meadows.	No
Rusty blackbird[1]	*Euphagus carolinus*	Forested wetlands	Yes
Semipalmated plover	*Charadrius semipalmatus*	Favors open habitats on migration, including broad mudflats, sandy beaches, lake shores, pools in salt marshes, and sometimes flooded or plowed fields.	No
Breeding Season Migrants (may occur only during the breeding season)			
Bachman's sparrow[1]	*Peucaea aestivalis*	Dry open pine or oak woods; nests on the ground in dense cover.	Yes
Chimney swift	*Chaetura pelagica*	Forages over variety of habitats, requires chimneys or large hollow tree snags with open tops for nesting.	Yes
Kentucky warbler	*Geothlypis formosa*	Large moist forest tracts with mature trees and thick understory.	Yes
Prairie warbler	*Dendroica discolor*	Various shrubby habitats, including regenerating forests, open brushy fields, and Christmas tree farms.	Yes
Prothonotary warbler	*Protonotaria citrea*	Forested wetlands with areas of standing water	Yes
Wood thrush	*Hylocichla mustelina*	Breeds in mature deciduous and mixed forests, forests with dense understory, and forest edges.	Yes[2]
Resident Species (may occur year-round)			
Bald eagle[1]	*Haliaeetus leucocephalis*	Nest in forested areas adjacent to large bodies of water. For perching they prefer tall coniferous or deciduous trees.	Yes
Brown-headed nuthatch[1]	*Sitta pusilla*	Open pine woods often mixed with deciduous trees.	No
Field sparrow[2]	*Spizella pusilla*	Found at all seasons in brushy overgrown fields, second growth, woodland edges, hedgerows, and sometimes around brushy edges of marshes.	Yes[2]
Red-headed woodpecker	*Melanerpes erythrocephalus*	Deciduous woodlands with oak or beech, groves of dead or dying trees, forested river bottoms, recent clearings, farmland, grasslands, forest edges and roadsides.	Yes

Sources: AUMNH 2022; USFWS 2021; USFWS 2024; National Audubon Society 2024
[1] Included based on the USFWS Information for Planning and Consultation (IPaC) database but uncommon to the Project Site based on the National Audubon Society range maps.
[2] Observed on the Project Site during field investigations.

3.5.1.4 Aquatic Life

3.5.1.4.1 Project Site
Field surveys were conducted by TVA biologists in the fall of 2023 and the spring of 2024 to verify the presence or absence of federally or state-listed aquatic species of conservation concern on the Project Site. Sampling was conducted in Wheeler Branch north (downstream) of CR 387 (Browns Ferry Road), just outside of the Project Site boundaries. The aquatic community within Wheeler Branch is typical of streams within the region. One fish (Tuscumbia darter) and one mollusk (round-rib elimia), both state-listed species of conservation concern, were encountered during the field surveys. These species are described in greater detail in Section 3.5.1.5.4 below. No other streams provided suitable habitat for threatened and endangered species and therefore were not surveyed.

3.5.1.4.2 TL Upgrade Areas
The aquatic life associated with the TL Upgrade Areas is generally the same as described for the Project Site in Section 3.5.1.4.1.

3.5.1.5 Threatened and Endangered Species
Threatened and endangered species are regulated by both the federal and state governments. Following TVA (2023a) guidelines, HDR reviewed the TVA Regional Natural Heritage Database (RNHD; TVA 2023b) for plant species within five miles of the Project Site and TL Upgrade Areas, terrestrial animal species within three miles of the Project Site and TL Upgrade Areas, and aquatic species within the Dry Creek-Mallard Creek (060300021106), Red Branch-Spring Creek (060300021201), Lower Big Nance Creek (060300050105), and McKieman Creek-Tennessee River (060300050801) watersheds. HDR also reviewed the USFWS IPaC database (USFWS 2024) for federal species of conservation concern with potential to occur on the Project Site and TL Upgrade Areas and the ALNHP rare species database (AUMNH 2022) for state-listed species of conservation concern with potential to occur in Lawrence County. Table 3-18 provides a summary of the federally and state-listed species of conservation concern within range of the Project Site and TL Upgrade Areas. No designated critical habitat for federally listed species occurs on or in the vicinity of the Project Site and TL Upgrade Areas.

Table 3-18. Federally and state-listed species of conservation concern potentially occurring on the Project Site and TL Upgrade Areas

Common Name ***Scientific Name***	**State Rank and Listing Status**[1]	**Federal Listing Status**[2]	**Likelihood of Occurrence**[3]	**Habitat Description**
		Plants		
Alabama Glade-cress *Leavenworthia alabamica*	S2	--	Unlikely	Limestone outcrops and cedar glades.
Alabama Larkspur *Delphinium alabamicum*	S3	--	Unlikely	Calcareous and prairie woods.
Allegheny-spurge *Pachysandra procumbens*	S2S3	--	Likely	Rich woods.
Bradley's Spleenwort *Asplenium bradleyi*	S2	--	Unlikely	Crevices on acidic rock outcrops, particularly on steep sandstone cliffs, in exposed, barren areas, sometimes in full sun.
Bristle Fern *Trichomanes boschianum*	S3	--	Unlikely	Rocky seeps.
Butler's Quillwort *Isoetes butleri*	S2	--	Unlikely	Thin, seasonally saturated soil over exposed limestone or dolomite bedrock.
Canada lily *Lilium canadense*	S2	--	Likely	Wet meadows, edges of moist rich woods and forests, streamside flats, bogs, marshes, swamps, and ditches along wet roadsides.
Carolina Anemone *Anemone caroliniana*	S3	--	Unlikely	Glades and cedar woodlands.
Carolina Gentian *Frasera caroliniensis*	S2	--	Unlikely	Upland savannas, upland woodlands, wooded slopes, limestone and sandstone glades, woodland openings, and small meadows in upland wooded area.
Cumberland Rosinweed *Silphium brachiatum*	S2	--	Unlikely	Rich rocky woods.
Duck River Bladderpod *Lesquerella densipila*	S1	--	Unlikely	Cedar glades with thin soil over limestone, open alluvial sites, stream bottoms, fallow fields
Dutchman's Breeches *Dicentra cucullaria*	S2	--	Unlikely	Forest floors, rocky woods, slopes, ledges, valleys, ravines and along stream
Dwarf Filmy-fern *Trichomanes petersii*	S2	--	Unlikely	Rocky seeps.
Eggert's sunflower	S2	DL	Likely	Barrens and roadsides.

Common Name *Scientific Name*	State Rank and Listing Status[1]	Federal Listing Status[2]	Likelihood of Occurrence[3]	Habitat Description
Helianthus eggertii				
Eggleston's Violet *Viola egglestonii*	S1	--	Unlikely	Limestone cedar glades.
Elliott's fan-petal *Sida elliottii*	S3	--	Likely	Disturbed sites, stream banks, grasslands, open, shrubby areas, prefers sandy soil.
Fleshy-fruit gladecress *Leavenworthia crassa*	--	FE	Unikely	Limestone outcroppings with exposed rock and shallow soil.
Gattinger's Prairie Clover *Dalea gattingeri*	S3	--	Unlikely	Dry, calcareous, rocky limestone glades
Glade Beardtongue *Penstemon tenuiflorus*	S2S3	--	Unlikely	Limestone glades and woodlands.
Golden Seal *Hydrastis canadensis*	S2	--	Unlikely	Mesic hardwood forests.
Goldie's woodfern *Dryopteris goldiana*	S1	--	Likely	Hardwood forest, ravines, along streams, swamp and seep edges.
Gorge Filmy Fern *Hymenophyllum tayloriae*	S1	--	Unlikely	Moist rock houses.
Harper's Grooved-yellow Flax *Linum sulcatum var. harperi*	S1	--	Unlikely	Gravel hill prairies, gravel prairies, gravelly slopes along rivers, loess hill prairies, sandy hill prairies, upland sand prairies, and limestone glades.
Harper's Umbrella Plant *Eriogonum harperi*	S1	--	Unlikely	Rocky bluffs.
Lake Cress *Armoracia lacustris*	S1	--	Unlikely	Quiet water, springs, lakes and sluggish, slow-moving streams, and muddy shores.
Large whorled pogonia *Isotria verticillata*	S2	--	Likely	Mesic to dry forests and woodlands, and occasionally in bogs.
Leafy Prairie Clover *Dalea foliosa*	S1	--	Unlikely	Rocky washes in glades.
Limestone Adder's-tongue *Ophioglossum engelmannii*	S3	--	Unlikely	Dry barrens and glades in calcareous areas.
Limestone Fame-flower	S2	--	Unlikely	Glades.

Common Name *Scientific Name*	State Rank and Listing Status[1]	Federal Listing Status[2]	Likelihood of Occurrence[3]	Habitat Description
Phemeranthus calcaricus				
Little Mountain Meadowrue *Thalictrum mirabile*	S2	--	Unlikely	Wet sandstone bluffs, sinks, and rocky crevices.
Log fern *Dryopteris celsa*	S2	--	Likely	Moist woods and swamps.
Lyrate Bladderpod *Paysonia lyrata*	S1	--	Unlikely	Open cedar glades and other open habitat, such as pastures, often with red-colored and limestone-derived soils.
Lyre-leaf Bladderpod *Lesquerella lyrata*	--	FT	Unlikely	Open cedar glades and other open habitat, such as pastures, often with red-colored and limestone-derived soils.
Menge's Fame-flower *Phemeranthus mengesii*	S3	--	Unlikely	Dry rock ledges.
Michaux Leavenworthia *Leavenworthia uniflora*	S2	--	Unlikely	Rocky ledges, cedar glades, pastures, roadsides, old fields, thin soil on limestone beds, seeps on limestone rubble.
Mountain camellia *Stewartia ovata*	S2S3	--	Likely	Forest understory or at the edges of openings along streams.
Narrow-leaved glade fern *Diplazium pycnocarpon*	S1S2	--	Likely	Rich, moist deciduous forest, wooded bluffs.
Nashville Breadroot *Pediomelum subacaule*	S2	--	Unlikely	Limestone cedar glades.
Nodding Trillium *Trillium flexipes*	S2S3	--	Unlikely	Rich deciduous woodlands, wooded slopes, large shady ravines, and rocky bluffs.
Prairie Indian Plantain *Arnoglossum plantagineum*	S1	--	Unlikely	Moist prairies and marshes.
Prairie trillium *Trillium recurvatum*	S2	--	Likely	Rich, open deciduous woodlands and savannas.
Prairie-dock *Silphium pinnatifidum*	S2	--	Unlikely	Prairies, barrens, and cedar glades.
Prices's potato-bean *Apios priceana*	S2	FT	Likely	Openings in rich woods.
Puttyroot *Aplectrum hyemale*	S2	--	Likely	Rich, mostly mesic, deciduous woodlands and the lower slopes of moist ravines.

Common Name ***Scientific Name***	**State Rank and Listing Status**[1]	**Federal Listing Status**[2]	**Likelihood of Occurrence**[3]	**Habitat Description**
Rock Clubmoss *Huperzia porophila*	S1	--	Unlikely	Moist, sheltered cliffs, usually on sandstone bedrock.
Roundleaf catchfly *Silene rotundifolia*	S1S2	--	Likely	Woodlands and around shaded cliffs.
Round-leaved Sundew *Drosera rotundifolia*	S1	--	Unlikely	Bogs and seeps.
Shining Clubmoss *Huperzia lucidula*	S2	--	Unlikely	Conifer, mixed or hardwood forest, shaded slopes, bogs, and conifer swamps.
Soft False Gromwell *Onosmodium molle ssp. molle*	S2	--	Unlikely	Dry to mesic sandy or gravelly prairies and open woods.
Southern Meadowrue *Thalictrum debile*	S2	--	Unlikely	Moist to dry forests, woodlands, and barrens, over mafic or ultramafic bedrock.
Southern twayblade *Listera australis*	S3	--	Likely	Wet-mesic woods.
Spring avens *Geum vernum*	S1	--	Likely	Floodplains and rich woods.
Sunnybell *Schoenolirion croceum*	S2	--	Unlikely	Limestone outcrops.
Sweet pinesap *Monotropsis odorata var. odorata*	S1	--	Likely	Piney woods.
Tennessee Milkvetch *Astragalus tennesseensis*	S1S2	--	Unlikely	Glades.
Water Stitchwort *Stellaria fontinalis*	S1	--	Unlikely	Seeps and limestone creek beds.
Wherry's Phloxy *Phlox pulchra*	S1	--	Unlikely	Wood margins and wood openings in moderately acid soils.
White trout lily *Erythronium albidum*	S1S2	--	Likely	Moist woods, on wooded slopes and bluffs, and along streams.

Common Name *Scientific Name*	State Rank and Listing Status[1]	Federal Listing Status[2]	Likelihood of Occurrence[3]	Habitat Description
Yellow Lady's-slipper *Cypripedium pubescens*	S3	--	Unlikely	Cypripedium parviflorum var. pubescens grows in boggy areas, swampy areas, damp woods, often with a rich layer of humus and decaying leaf litter, near rivers or canal banks.
Yellow Sunnybell *Schoenolirion croceum*	S2	--	Unlikely	Wet areas in glades.
Mammals				
Appalachian Cottontail *Sylvilagus obscurus*	S1	--	Unlikely	Montane areas of high elevation coniferous forests as well as areas providing dense cove
Eastern spotted skunk *Spilogale putorius*	S2S3	--	Likely	Rocky outcrops, open prairies, brushy areas, cultivated fields, and barnyards, pine forests.
Gray bat[4] *Myotis grisescens*	S2	FE	Known	Roosts in caves or karst features year-round. Various foraging habitats including wet meadows, damp woods, and uplands.
Indiana bat *Myotis sodalis*	S2	FE	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide.
Little brown bat *Myotis lucifugus*	--	UR	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide.
Northern long-eared bat *Myotis septentrionalis*	--	FE	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures, sinkhole/karst features; statewide.
Rafinesque's big-eared bat *Corynorhinus rafinesquii*	S2, SP	--	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide.
Tricolored bat[4] *Perimyotis subflavus*	--	FPE	Known	Generally associated with forested landscapes but may roost near openings.
Birds				
Red-cockaded Woodpecker *Dryobates borealis*	S2	FT	Unlikely	Mature pine forests with very open understory maintained by frequent fires.
Whooping Crane *Grus americana*	--	EXPN	Unlikely	Shallow markets with adjacent open grasslands.
Reptiles				

Common Name *Scientific Name*	State Rank and Listing Status[1]	Federal Listing Status[2]	Likelihood of Occurrence[3]	Habitat Description
Alligator snapping turtle *Macrochelys temminckii*	S3, SP	PT	Unlikely	Inhabits large rivers, major tributaries, bayous, canals, swamps, lakes, ponds, and oxbows
Coal skink *Plestiodon anthracinus*	S3	--	Likely	Humid wooded areas with abundant leaf litter and loose rocks; vicinity of springs, swamps, and bogs.
Fish				
Bankhead darter *Percina sipsi*	S1	--	Likely	Found over gravel substrate in pools and the heads of riffles in creeks to medium rivers.
Flame Chub *Hemitremia flammea*	S3	--	Unlikely	Springs and spring-fed streams with lush aquatic vegetation.
Slackwater darter *Etheostoma boschungi*	S1, SP	FT	Likely	Gravel-bottomed creeks and small rivers; spawns in seepage water in fields and open woods.
Slender madtom *Noturus exilis*	S3	--	Likely	Riffles of small- to medium-sized permanent spring-fed creeks with moderate to swift currents.
Southern Cavefish *Typhlichthys subterraneus*	S3, SP	--	Unlikely	Aquatic cave obligate; cave streams, karst waters, and water supply wells.
Spring Pygmy Sunfish *Elassoma alabamae*	S1, SP	FT	Unlikely	Spring pools and spring runs, typically in calm, clear water with abundant aquatic vegetation.
Stripetail darter *Etheostoma kennicotti*	S3	--	Likely	Rocky pools of creeks and small rivers.
Tuscumbia darter *Etheostoma tuscumbia*	S2, SP	UR	Likely	Ponded spring-fed habitats of valley floor springs.
Crustaceans				
Alabama Cave Crayfish *Cambarus jonesi*	S2	--	Unlikely	Underground cave systems in the Tennessee River Basin.
White Spring Cave Crayfish *Cambarus veitchorum*	S1	--	Unlikely	Cave-dwelling species known only from the White Spring Cave.
Mollusks				
Alabama moccasinshell *Medionidus acutissimus*	S2	--	Likely	Small-medium sized rivers, in shallow areas with current and substrates of fine gravel, sand, & silt; occurs in the Mobile Basin and Gulf Coast drainage.

Common Name *Scientific Name*	State Rank and Listing Status[1]	Federal Listing Status[2]	Likelihood of Occurrence[3]	Habitat Description
Alabama rainbow *Villosa nebulosa*	S3	--	Likely	Creeks to medium-sized rivers in sand/gravel riffles with moderate current; occurs in the Mobile Basin upstream of the Fall Line.
Dromedary Pearlymussel *Dromus dromas*	SX, SP	FE, EXPN	Unlikely	Medium-large rivers with riffles and shoals w/ relatively firm rubble, gravel, and stable substrates; endemic to Cumberlandian Region.
Hickorynut *Obovaria olivaria*	SX, PSM	--	Unlikely	Large rivers and lakes in sand or sand/gravel substrates; historically occurred in Tennessee River upstream to Muscle shoals, currently extirpated.
Kidneyshell *Ptychobranchus fasciolaris*	S2, PSM	--	Likely	High water quality creeks, rivers, and lakes with moderate to swift currents and sand or gravel substrates; occurs in Tennessee River system.
Lilliput *Toxolasma parvum*	S3, PSM	--	Unlikely	Quiet waters of low-gradient streams, river, and reservoirs, often in muddy bottoms; Tennessee River system, Mobile Basin, and Gulf Coast drainages.
Longsolid *Fusconaia subrotunda*	--	FT	Likely	Inhabits streams and small rivers with sand and gravel substrate.
Mucket *Actinonaias ligamentina*	S2, PSM	--	Unlikely	Medium to large rivers over coarse sand and gravel substrate; restricted to Tennessee River drainage.
Ohio Pigtoe *Pleurobema cordatum*	S2, PSM	--	Unlikely	Medium to large rivers with moderate flow and sand or gravel substrate but may also tolerate some reservoir environments.
Orangeacre Mucket *Hamiota perovalis*	S2	--	Unlikely	Stable sand, gravel, and cobble substrates with moderate to swift current in large streams and small rivers; endemic to western Mobile Basin.
Orangefoot Pimpleback *Plethobasus cooperianus*	SX, SP	FE, EXPN	Unlikely	Perennial streams with rocky areas and swift to slow moving currents; historically in Tennessee River Basin, currently extirpated.
Painted Creekshell *Villosa taeniata*	S2, PSM	--	Unlikely	Found in substrates of mixed sand and gravel with good current in less than three feet of water in rivers of all sizes; endemic to Cumberlandian Region.
Pink Mucket *Lampsilis abrupta*	S1, SP	FE	Unlikely	Large rivers with sand-gravel or rocky substrates with moderate to strong currents; restricted to Tennessee River system, specifically in tailwaters of Tennessee River dams and a short reach of Bear Creek in Colbert County.
Pink Papershell *Potamilus ohiensis*	S3, PSM	--	Unlikely	Large rivers with mud, sand, or silt bottoms in Mississippi drainage.

Common Name *Scientific Name*	State Rank and Listing Status[1]	Federal Listing Status[2]	Likelihood of Occurrence[3]	Habitat Description
Pocketbook *Lampsilis ovata*	S2, PSM	--	Likely	Large creeks or small rivers with strong currents, with shoals and pools and occasionally in riffles; endemic to Tennessee River drainage.
Purple lilliput *Toxolasma lividum*	S2	--	Likely	Small-medium sized rivers & lg creeks, in mud, sand, & gravel substrates; restricted to Tennessee River drainage.
Ring Pink *Obovaria retusa*	SH, SP	FE, EXPN	Unlikely	Large rivers in sand and gravel; restricted to Tennessee River system.
Rough Pigtoe *Pleurobema plenum*	S1, SP	FE, EXPN	Unlikely	Medium to large rivers, in substrates ranging from mud and sand to gravel, cobble, and boulders;
Sheepnose Mussel *Plethobasus cyphyus*	S1, SP	FE	Unlikely	Large to medium-sized rivers, in riffles and coarse sand/gravel substrate.
Skirted hornsnail *Pleurocera pyrenella*	S2	--	Likely	Creeks and mediums rivers that are tributaries of the Tennessee River in north-central Alabama.
Slender campeloma *Campeloma decampi*	S1, SP	FE	Likely	Burrows in soft sediment, detritus, and sometimes in gravel substrates anywhere from the margins to midstream.
Slowwater Elimia *Elimia interveniens*	S2	--	Unlikely	Inhabits rocks, sandy, and muddy substrate in lakes, ponds, and rivers.
Spectaclecase *Cumberlandia monodonta*	S1, SP	FE	Unlikely	Medium to large rivers; in substrates ranging from mud and sand to gravel, cobble, and boulders.
Spiral hornsnail *Pleurocera brumbyi*	S2S3	--	Likely	Creeks and medium rivers that are tributaries of the Tennessee River in northern Alabama.
Tennessee pigtoe *Pleuronaia barnesiana*	S1, PSM	UR	Likely	Small tributary streams to large creeks with sandy gravel substrate; Endemic to Cumberlandian Region across northern Alabama.
Triangular kidneyshell *Ptychobranchus greenii*	S1	--	Likely	Shoal habitats in small creeks to large rivers, usually in sand and gravel substrates; Endemic to Mobile Basin upstream of Fall Line.
Tuberculed blossom (pearlymussel) *Epioblasma torulosa*	SX, SP	FE	Likely	Riffles or shoals in shallow waters of medium rivers or creeks with sandy gravel substrate and rapid currents; historically found across northern Alabama in Tennessee River.
Warrier Pigtoe *Pleurobema rubellum*	S1	--	Unlikely	Found in highly oxygenated, clear streams with moderate flow over sand and gravel substrate; limited to the tributaries of the Sipsey Fork,

Common Name *Scientific Name*	State Rank and Listing Status[1]	Federal Listing Status[2]	Likelihood of Occurrence[3]	Habitat Description
				Winston County, and the North River in Tuscaloosa and Fayette Counties and its tributary Clear Creek, Fayette County, all in Alabama
White heelsplitter *Lasmigona complanata*	S2, PSM	--	Likely	Slower waters of medium streams and rivers, and occasionally in small tributaries; Tennessee River system.
Roud-rib elimia[5] *Elimia nassula*	S1	UR	Likely	Inhabits springs and spring-run habitats, utilizing a variety of substrates including sandy spring bottoms, aquatic vegetation, tree roots, and other hard substrates.
Insects and Arachnids				
Caddisfly *Agapetus hessi*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Cheumatopsyche kinlockensis*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Dolophilodes major*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Hydroptila coweetensis*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax atlanta*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax concinnus*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax ornatus*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax securis*	S1S2	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Orthotrichia baldufi*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Platycentropus radiatus*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.

Common Name ***Scientific Name***	**State Rank and Listing Status**[1]	**Federal Listing Status**[2]	**Likelihood of Occurrence**[3]	**Habitat Description**
Caddisfly *Rhyacophila carolae*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Rhyacophila minor*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Cave Obligate Beetle *Batriasymmodes spelaeus*	S3	--	Unlikely	Caves and subterrestrial habitats in Alabama and Tennessee.
Monarch butterfly *Danaus plexippus*	--	PT	Likely	Milkweed and nectar-producing flowering plants.
Pseudoscorpion *Trisetobisium fallax*	S3	--	Likely	Moss, leaf litter, and under stones, logs, or bark.

Sources: AUMNH 2022; TVA 2023b; USFWS 2024
[1] SP = State Protected; S1 = Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few individuals, or because of some special condition where the species is particularly vulnerable to extinction; S2 = Very rare and imperiled in the state, 6–20 occurrences, or few remaining individuals, or because of some factor(s) making the species vulnerable to extinction; S3 = Rare and uncommon in the state, 21–100 occurrences; SX = Presumed Extirpated; PSM = Partial Status Mussels: all mussels species not listed as protected species under the Invertebrate Species Regulation are partially protected by other regulations of the Alabama Game, Fish, and Fur Bearing Animals Regulations.
[2] FE = Federally Endangered; FT = Federally Threatened; FPE = Federally Proposed as Endangered; PT = Federally Proposed as Threatened; DL = Delisted; UR = under review for federal listing, EXPN = Experimental Population.
[3] Known = The species has been documented in the Project Site or vicinity by a reliable observer; Likely = The Project Site or vicinity is within the species' currently known range, and vegetation communities, soils, etc. resemble those known to be used and/or inhabited by the species; Unlikely = The Project Site or vicinity is within the species' currently known range, but vegetation communities, soils, etc. do not resemble those known to be used by the species, or the Project Site is clearly outside the species' currently known range.
[4] Previously observed on the Project Site.
[5] While not included in the RNHD, IPaC, or ALNHP lists; TVA biologists identified the round-rib elimia in Wheeler Branch during the fall of 2023 and spring of 2024 aquatic life surveys.

3.5.1.5.1 Plants

Although none of the 60 federally or state-listed plant species of conservation concern potentially occurring on the Project Site and TL Upgrade Areas were observed during the field surveys, suitable habitat for 17 of the species exists on the Project Site and TL Upgrade Areas (Table 3-17). Based on the vegetation survey, some forested areas primarily in the eastern portion of the Project Site contain moderate to high level of suitability to contain state and federally listed plant species (Appendix B). The listed species with suitable habitat present on the Project Site and TL Upgrade Areas area described below.

Allegheny spurge is an herbaceous evergreen perennial that grows in rich, mature, deciduous forests, often near the bottom of slopes (Keener et al. 2024).

Canada lily is a large flowering perennial that grows in wet meadows, edges of moist rich woods and forests, streamside flats, bogs, marshes, swamps, and ditches along wet roadsides (Keener et al. 2024).

Eggert’s sunflower is a perennial species in the aster family (Asteraceae) found only in the Interior Low Plateaus of Kentucky, Tennessee, and Alabama where the species occurs in barrens habitat and alongside roads (NatureServe 2023). Eggert’s sunflower was previously listed as threatened under the ESA but was delisted in 2005 based on the species’ successful recovery.

Elliott's fan-petal is a perennial herb or subshrub with a tap root that can be found at scattered locations across Alabama (Keener et al. 2024). This species occurs in prairies, in scrub oak woods, in sand hills, in xeric sandy longleaf pine woods, and on disturbed sites.

Fleshy-fruit gladecress is a winter annual, spring-flowering member of the mustard family that is only found in Alabama. This species occurs in limestone outcroppings with exposed and shallow soil (USFWS 2023).

Goldie’s woodfern is a large, perennial fern that inhabits hardwood forest, ravines, along streams, swamp, and seep edges (NatureServe 2023).

The large whorled pogonia is a perennial orchid that requires rich, deciduous or mixed, moist forest on sandy soil with abundant humus (NatureServe 2023).

Log fern is a semi-evergreen perennial fern occurs in scattered locations across Alabama (Keener et al. 2024). Log fern grows around lime sinks and caves, along small- to medium-sized streams, and in rich hardwood forest often near limestone.

Mountain camellia is a small tree occurring at low to mid-elevations in the southern Appalachian Mountains and nearby regions from Mississippi to Virginia (International Dendrology Society 2023). This species can be found in the forest understory or at the edges of openings along streams.

Narrow-leaved glade fern is a perennial fern that inhabits rich, moist, deciduous forest and wooded bluffs (NatureServe 2023).

Prairie trillium is a perennial herb occurring on the floodplain, in rich woods, and on bluffs within the Mississippi River Basin (NatureServe 2023). In Alabama, prairie trillium is generally found in prairie woods of the Black Belt or limestone calcareous woods of north Alabama (Keener et al. 2024).

Price's potato-bean is a perennial, climbing vine growing from a stout tuber (NatureServe 2023). Price's potato-bean grows in forest openings in mixed hardwood stands where ravine slopes grade into creek or stream bottoms.

Puttyroot is a perennial herb that occupies rich, mostly mesic, deciduous woodlands and the lower slopes of moist ravines (NatureServe 2023).

Southern twayblade is a perennial orchid found throughout Alabama (Keener et al. 2024). Southern twayblade grows in wet hardwood or hardwood/evergreen forests, along streams, and in seeps.

Spring avens is a disturbance-tolerant early successional species which is common throughout the Great Lakes region and eastern U.S. in mesic woods and roadsides (NatureServe 2023). This plant is considered rare along the edges of its natural range, including in Alabama.

Sweet pinesap is a rare, herbaceous perennial wildflower occurring in piney woods throughout the southeast (USDA 2023c).

White trout lily is a perennial wildflower found in moist woods, on wooded slopes and bluffs, and along streams (NatureServe 2023).

3.5.1.5.2 Mammals

Suitable habitat for seven of the eight federally or state-listed mammal species of conservation concern exists on the Project Site and TL Upgrade Areas (see Table 3-17 and Table 3-19). Specifically, species with suitable habitat include two state-listed species of conservation concern (eastern spotted skunk and Rafinesque's big-eared bat), three federally listed species (northern long-eared bat, gray bat, and the Indiana bat), one species proposed for federal listing (tricolored bat), and one species under review for federal listing (little brown bat). Collectively, the six bat species are referred to below as Project bat species. Suitable habitat for the Appalachian cottontail; a state-listed species, is not present on the Project Site or TL Upgrade Areas. The seven listed species with suitable habitat present within the Project Site and TL Upgrade Areas area described below.

The eastern spotted skunk is state-ranked as imperiled and rare in Alabama. This species typically inhabits a wide variety of habitats inclusive of forested areas with significant cover, open and bushy areas, and rocky canyons and outcrops in woodlands and prairies (NatureServe 2023). Habitat for this species was identified on the Project Site.

During the summer, the Indiana bat, northern long-eared bat, and Rafinesque's big-eared bat roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees of varying size, age, and species (USFWS 2006, 2015). The Indiana bat, northern long-eared bat, and Rafinesque's big-eared bat overwinter in caves and cave-like structures such as mines and railroad tunnels. The gray bat almost exclusively roosts in large caves year-round, but may also roost in barns, dams, and storm drains (Alabama Department of Conservation and Natural Resources [ADCNR] 2024). The gray bat may travel more than 30 miles per night to and from summer foraging sites. The tricolored bat roosts in caves, hollow trees, under tree bark, in brush piles, and sometimes buildings in the summer and hibernates in caves, mines, and rock crevices in the winter (ADCNR 2024). The little brown bat roosts in tree cavities, underneath rocks, in piles of wood, in crevices, and occasionally in caves and human-made structures in the summer and hibernates in caves in the winter (ADCNR 2024). The little brown bat was targeted in field surveys because it is under review for federal listing.

Bat habitat assessments were conducted by HDR environmental scientists and Biotope Forestry & Environmental (Biotope) bat biologists, which included mist net surveys conducted by Biotope biologists in August 2023. Mist net surveys were conducted to verify the presence or probable absence of the Project bat species and to further document their suitable habitat on the Project Site and TL Upgrade Areas (Biotope 2023). Habitat for Project bat species was identified within forested areas and manmade structures, which could be utilized as summer roosting and foraging habitat. Although the Project Site and TL Upgrade areas are located within a geological region known for the occurrence of karst landforms, no sinkholes or caves were identified within the Project Site or TL Upgrade Areas during the field survey efforts including geotechnical subsurface explorations. Bat winter roosting habitat was not identified and is not anticipated to occur within the Project Site or TL Upgrade Areas.

A total of 22 forest stands totaling approximately 749 acres on the Project Site were considered suitable summer foraging and roosting habitat for the Project bat species (Figure 3-24). These areas consist of trees of varying ages, including dead snags, that have exfoliating bark, crevices, or cracks. Foraging habitat for the Project bat species is present on the Project Site over wetlands, open cattle pastures, open waters and ponds, streams, within forested habitat, forest edges, and tree lines. Water resources for the Project bat species include open waters and ponds primarily fed by rainwater and stream channels located on-site.

The forest stands were categorized as providing either low, moderate, or high-quality bat habitat based on the presence of trees with peeling/exfoliating bark, suitable snags, distance from water source, and connection to other stands per TVA (2023a) guidelines. Of the 749 acres of suitable bat habitat, approximately 225 acres (30 percent) were categorized as high-quality habitat, approximately 189 acres (25 percent) were categorized as moderate quality habitat, and approximately 334 acres (45 percent) were categorized as low-quality habitat (Table 3-19).

While most bat habitat was found in forested areas on the Project Site, additional foraging habitat for bats was identified over surface waters and in some herbaceous vegetation communities. High-quality habitat contains mature forest with several trees that have a DBH of greater than 15 inches, is near waterways, and has low density understory. Moderate quality habitat contains several suitable roosting trees that have a DBH of three to 15 inches and a denser understory. Low quality habitat contains younger trees that have grown close together (TVA 2023a). The culverts were inspected for bat habitat, but none were deemed as suitable habitat due to frequent water flow. Three culverts were observed within the TL Upgrade Areas; however, the culverts were less than three feet in diameter and did not require visual inspection. Two wooden farm structures on the Project Site provide potential roosting summer roosting habitat for some of the Project bat species. However, signs of bat use (e.g., guano) within these structures were not observed at the time of the survey and these buildings are not considered bat habitat (Appendix B).

Table 3-19. Summary of suitable bat habitat stands on the Project Site

Stand Number	Habitat Suitability	Area (acres)
Forest Stand 1	High Quality	35.3
Forest Stand 2	Moderate Quality	39.8
Forest Stand 3	Moderate Quality	87.7
Forest Stand 4	Low Quality	38.3
Forest Stand 5	Low Quality	60.8
Forest Stand 6	Low Quality	22.2
Forest Stand 7	Low Quality	3.4
Forest Stand 8	Low Quality	15.1
Forest Stand 9	Low Quality	9.1
Forest Stand 10	High Quality	103.2
Forest Stand 11	Low Quality	2.9
Forest Stand 12	Low Quality	2.7
Forest Stand 13	Low Quality	45.6
Forest Stand 14	Low Quality	14.2
Forest Stand 15	High Quality	86.8
Forest Stand 16	Moderate Quality	40.2
Forest Stand 17	Low Quality	94.2
Forest Stand 18	Low Quality	14.1
Forest Stand 19	Low Quality	4.6
Forest Stand 20	Moderate Quality	21.7
Forest Stand 21	Low Quality	4.1
Forest Stand 22	Low Quality	2.7
	Total Area	**748.7**

Mist net surveys were conducted at eight sites with five mist nets for two calendar nights, totaling ten mist net nights per site. One linear site was surveyed with two mist nets for two calendar nights, totaling four mist net nights. Mist nets were established along primary corridors, interior forest, across streams, and on the forest edges to maximize bat captures. A total of 41 individual bats consisting of five species were captured, including one lactating female adult tricolored bat, one scrotal male adult gray bat, and one non-reproductive female adult gray bat. No northern long-eared bats, Indiana bats, or little brown bats were captured. Other species of bat captured during the survey were the big brown bat, eastern red bat, and evening bat. The female tricolored bat was tracked for seven consecutive days. During this period, three roosting trees were identified on the Project Site; however, one of the roosting trees was later downed by a severe storm leaving only two known roosting trees on the Project Site (Figure 3-24). Further detail on the mist net survey can be found in Appendix B.

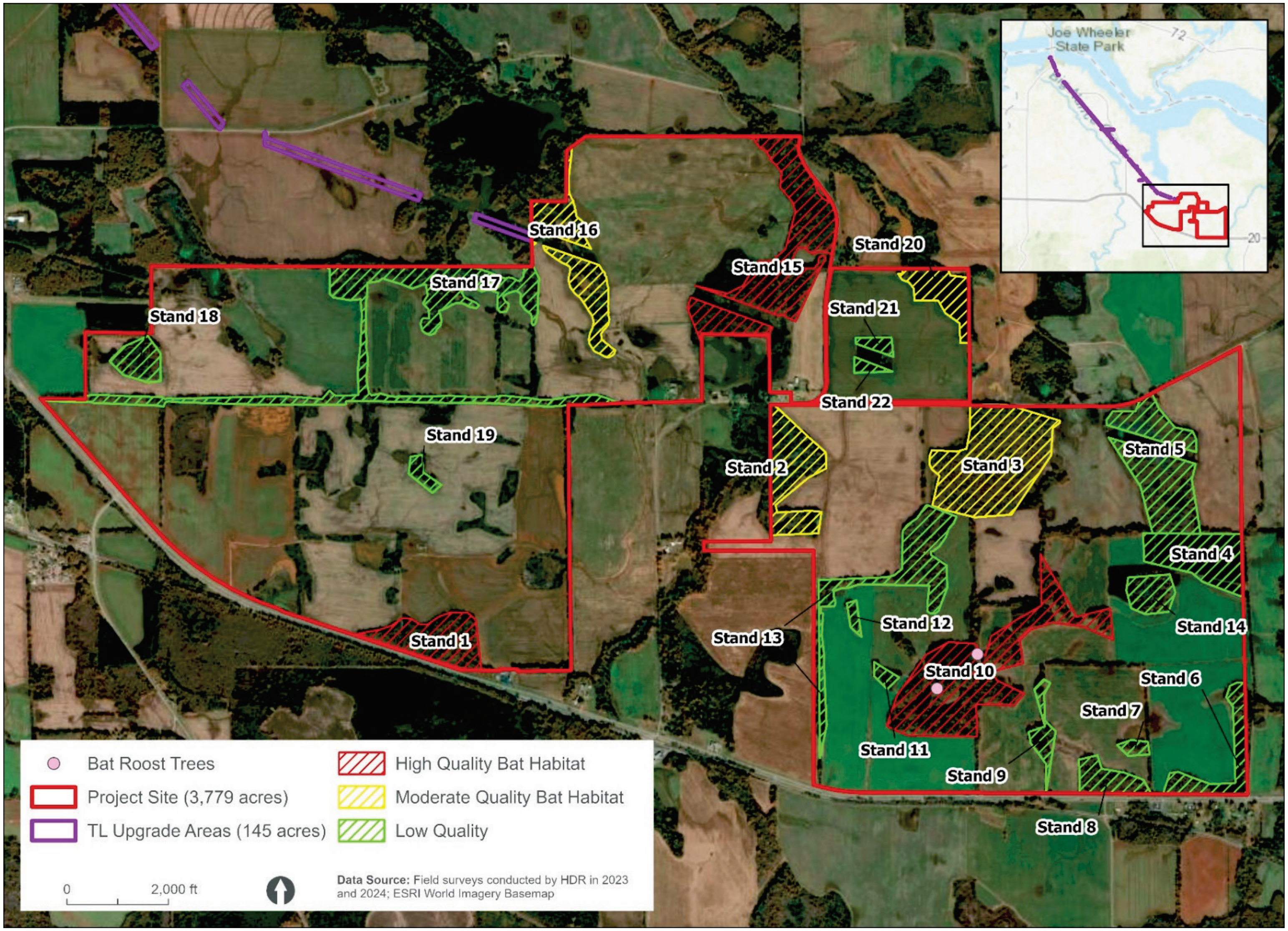

Figure 3-24. Bat habitat on the Project Site

3.5.1.5.3 Birds
Suitable habitat for the two federally listed bird species, the red-cockaded woodpecker and whooping crane, was not observed on the Project Site or TL Upgrade Areas (Table 3-21).

3.5.1.5.4 Reptiles
The coal skink is a state-listed reptile species of conservation concern with suitable habitat in Project Site and TL Upgrade Areas (Table 3-19). Coal skinks inhabit hilly sites with mixed hardwood-pine forests and are typically encountered in mesic situations in rotting logs, under rocks, or in leaf litter, seldom far from streams (ADCNR 2024). Potential habitat for coal skink was identified on the Project Site in forested wetlands.

Suitable habitat for the alligator snaping turtle is not present on the Project Site or TL Upgrade Areas.

3.5.1.5.5 Aquatic Species
Suitable habitat for five of the eight state or federally listed fish species exists on the Project Site and TL Upgrade Areas (Table 3-19). One federally threatened fish, one fish under federal review, and three state-ranked fish species were identified as potentially occurring on the Project Site and TL Upgrade Areas.

The slackwater darter is known from one disjunct population in Alabama, including the Cypress Creek, upper Shoal Creek, and Flint River systems in northern Alabama (ADCNR 2024). Slackwater darters are found during much of the year in pool areas of small streams that contain organic debris and migrate into adjacent flooded lowland areas with spring seepage to spawn. Potential habitat for this species was identified in Wheeler Branch, which is in the central portion of the Project Site; however, this species was not observed during aquatic life surveys of nearby, off-site stream segments. No other streams provided suitable habitat for threatened and endangered species and therefore were not surveyed.

The Tuscumbia darter is restricted to vegetated spring pools and runs with slow current and is usually associated with aquatic plants or algae over clean substrates of fine gravel, sand, and silt. This species resides in high-quality habitats in water that is generally clear, clean, and cool (50–57°F) (Etnier and Starnes 1993; Boschung and Mayden 2004; Page and Burr 2011). Potential habitat for this species was identified in Wheeler Branch during the August 2023 and October 2023 field surveys, and previous occurrences have been documented on the Project Site according to the TVA RNHD. The Tuscumbia darter was encountered in Wheeler Branch during the aquatic life surveys conducted by TVA biologists in the fall of 2023 and the spring of 2024. According to USFWS (2011), this species has been petitioned for federal listing due to present or threatened destruction, modification, or curtailment of suitable habitat or range; inadequacy of existing regulatory mechanisms; and other natural or manmade factors. Existing populations are vulnerable to human alterations of spring heads.

The Bankhead darter typically inhabits rocky, flowing pools and runs of creeks and small rivers (NatureServe 2023). Bankhead darters usually occur in clear water over sand and fine gravel, generally associated with leaf packs and/or wood debris but may occasionally occur over open bedrock. Potential habitat for this species on the Project Site was identified in Wheeler Branch; however, this species was not observed during aquatic life surveys.

The range of the slender madtom is limited to the western half of the Tennessee River drainage (ADCNR 2024). Slender madtoms typically inhabit riffles in small or medium sized streams with moderate to swift currents that flow over sand and gravel substrates. Although Wheeler Branch had slow to moderate currents at the time of the August 2023 and October 2023 field surveys, evidence of stronger currents was indicated by the presence of erosion and drift deposits. Therefore, Wheeler Branch may provide suitable habitat for the slender madtom on the Project Site; however, this species was not observed during aquatic life surveys.

The stripetail darter is most commonly found in the Paint Rock River system and less frequently in other streams in the Tennessee River Drainage (ADCNR 2024). This species inhabits small to moderately sized streams with shallow pools over slabrock substrate, which provides cover and serves as spawning sites. Potential habitat for the stripetail darter on the Project Site was identified in Wheeler Branch; however, this species was not observed during aquatic life surveys.

Suitable habitat for the two state-listed crustacean species of conservation concern was not observed on the Project Site or TL Upgrade Areas (Table 3-19).

Suitable habitat for 14 of the 30 state or federally listed mollusk species exists on the Project Site and TL Upgrade Areas (Table 3-19). Table 3-19 lists 14 species of aquatic mollusks including four snails and ten species of mussels with potential to occur on the Project Site and TL Upgrade Areas. The spiraled hornsnail was previously reported on the Project Site according to the TVA RNHD. The round-rib elimia was encountered in Wheeler Branch during the aquatic life surveys of nearby, off-site stream segments conducted by TVA biologists in the fall of 2023 and spring of 2024. The round-rib elimia is a rare aquatic snail endemic to the Tennessee River system in northern Alabama where the snail typically inhabits springs and spring-run habitats, utilizing a variety of substrates including sandy spring bottoms, aquatic vegetation, tree roots, and other hard substrates (Burch 1989). This species is of highest conservation concern in Alabama and is under federal review for potential listing.

3.5.1.5.6 Insects and Arachnids

Monarch butterflies are proposed for federal listing as threatened. They are dependent on milkweed for egg-laying and larval monarchs only feed on milkweed. Monarch butterflies prefer habitats that provide milkweed and other flowering plants for nectar during the adult phase. These areas include roadsides, open areas such as fields, wet areas with flowering species, or urban gardens (NatureServe 2023). No milkweeds or monarch butterflies were observed during the August 2023 and October 2023 field surveys. However, based on the large number of flowering plants occurring in the vicinity of the Project Site, there is potential for adult monarch butterflies to be present, and if milkweed is present, also for the larva.

Thirteen species of state-listed insects and/or arachnids of conservation concern were identified as having potential to occur on the Project Site, including twelve species of caddisfly and a pseudoscorpion. Caddisflies are a large group of insects (i.e., over 1,500 species) with an aquatic larval stage (REC0004 2023). Caddisfly larvae are typically found in higher quality aquatic habitats with medium- to fast-moving water. In-stream surveys for aquatic benthic macrofauna were conducted as part of the fall 2023 and spring 2024 aquatic life surveys, and these species were not observed. However, suitable habitat potentially exists on the Project Site to support these species as several streams on-site contain gravel and sand substrates with moderately flowing water.

Pseudoscorpions are small, scorpion-like arachnids that inhabit a wide variety of environments. In forested environments, they may be found among moss and leaf litter, and under objects such as stones, logs, bark, and debris (NatureServe 2023). No pseudoscorpions were identified during the August 2023 and October 2023 field surveys as the small size of these organisms often precludes observation; however, based on their general habitat requirements, the potential exists for this species to occur on the Project Site.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to biological resources would be expected to occur. Existing land use would be expected to remain primarily agricultural land for the foreseeable future.

3.5.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, direct impacts to vegetation and wildlife would result from construction and operation of the Project.

3.5.2.2.1 Vegetation

3.5.2.2.1.1 Project Site

Under the Proposed Action Alternative, approximately 1,323 acres of agricultural and maintained lawn are within the area to be developed on the Project Site. The agricultural fields and maintained lawns that constitute most of the Project Site have been regularly disturbed and are managed for crop production or industrial maintenance; therefore, the conversion of this vegetation community to herbaceous, perennial species would not result in substantial impacts. Approximately 155 acres of clearcut forest are within the area to be developed on the Project Site. Permanent impacts of up to 95 acres of dry and wet deciduous forest on the Project Site would result from clearing to prevent shading of the PV panels. The woodlands on the Project Site support both native and non-native species but have low conservation value and do not support unique natural plant communities. Therefore, impacts to woodlands on the Project Site would likely be minor to moderate.

Although clearing and grading activities would remove vegetation, particularly in the areas that are not cultivated cropland, the Project Site would be revegetated by planting a mixture of fast-growing annual species and long-lived perennial species. This would likely result in an increase in plant diversity over that of the cultivated cropland. Vegetation on developed portions of the Project Site would be maintained to control growth through occasional mowing.

To promote environmental stewardship and pollinator habitat along with clean, renewable energy, Hillsboro Solar, LLC would establish and maintain up to 50 acres of the Project Site as species-rich native plant meadow. These areas would be developed as several narrow strips surrounding or adjacent to the solar arrays that formerly supported croplands or in areas where trees were recently harvested. No forested land would be cleared to create the meadow zones. The establishment of the species-rich native plant meadow would have a minor beneficial effect on local plant diversity. The 1,386 acres of the Project Site that is currently cropland and would not be developed would eventually succeed to shrubland and the forest, resulting in a large increase in plant diversity, resulting in a moderate beneficial impact.

3.5.2.2.1.2 TL Upgrade Areas

TL upgrades would require improvements to existing access roads, construction of temporary access roads, replacement of one TL structure, and installation of four new TL pole structures. If necessary, brush clearing or tree trimming may be conducted to allow for the passage of equipment, but tree removal is not expected. Minor ground disturbance is expected in these areas, but if the ground is disturbed, the access road area would be revegetated using native, low-growing plant species after required TL upgrade work is completed to minimize the potential for increased soil erosion and stormwater runoff (TVA 2022a). Routine management of vegetation within non-agricultural portions of the TL Upgrade Areas would be conducted under an integrated vegetation management approach designed to encourage low-growing plant species and discourage tall-growing plant species.

3.5.2.2.2 Wildlife

3.5.2.2.2.1 Project Site

Under the Proposed Action Alternative, the Project Site would be cleared of debris and tall vegetation, mowed, fenced, and lightly graded, as needed for installation of the solar arrays and associated infrastructure. Up to 95 acres of forested habitat would be converted to herbaceous habitat. Direct impacts to some individual wildlife species are likely if those individuals are immobile during the time of habitat removal (e.g., during breeding/nesting and hibernation seasons). Habitat removal would likely disperse mobile wildlife into surrounding areas in attempts to find new food resources, shelter, and to reestablish territories. Since most of the Project Site is regularly disturbed from agricultural practices and forested areas on the Project Site are fragmented and considering the amount of similar habitat in areas immediately adjacent to the Project Site, impacts to populations of common wildlife species are anticipated to be minimal to negligible. Approximately 739 acres of forested habitat on the Project Site will not be impacted by the developed area. Agricultural management on land that is currently being used for row cropping on portions of the Project Site would be discontinued during the Project lifetime leading this land to eventually succeed from cropland to shrubland and eventually forest. This succession would lead to an increase in available forested habitat and benefit wildlife.

Bees, moths, butterflies, and many other insects are critical components of ecosystems and crop production due to their roles as pollinators. As discussed in Section 2.2, Hillsboro Solar, LLC proposes to establish and maintain up to 50 acres of species-rich native plant meadows to promote pollinator habitat on the Project Site. These meadows would be seeded with a wide variety of native grasses and wildflowers. Pollinators are often reliant on a specific host plant for their larval stage and later require a variety of food plants nearby to survive and reproduce. Establishment of the species-rich native plant meadow areas would result in an increased abundance and diversity of pollinator species in the Project Site and support nationwide efforts to increase pollinator habitat. The native plant meadow areas would also benefit several birds, mammals, and other wildlife.

3.5.2.2.2.2 TL Upgrade Areas

The OPGW would be installed via helicopter, and ground crews would use the access roads to run the OPGW. Minor ground disturbance immediately surrounding the towers could occur during upgrade activities. Wildlife in the TL Upgrade Areas may be disturbed and move to similar, adjacent habitats during work activities; however, disturbance would be short-term. Impacts to wildlife or habitat in the TL Upgrade Areas would be minor.

3.5.2.2.3 Migratory Birds

3.5.2.2.3.1 Project Site

Of the 23 birds of conservation concern, at least 10 could occur with some regularity on or in the immediate vicinity of the Project Site based on suitable available habitat. The clearing of 95 acres of forest would eliminate potential habitat for the chimney swift, Kentucky warbler, prothonotary warbler, red-headed woodpecker, rusty blackbird, and wood thrush as well as other more common migratory birds inhabiting forests. The removal of wooded and brushy fencerows and scattered large trees would eliminate potential habitat for the Bachman's sparrow, field sparrow, and prairie warbler. The removal of 1,478 acres of open fields and croplands would eliminate potential habitat for the bobolink, however, 1,651 acres would remain on the Project Site. Approximately 1.62 acre of forested wetlands would be impacted by conversion to emergent wetlands and would reduce habitat for the rusty blackbird and prothonotary warbler. However, the Project would establish 50-foot SMZs surrounding wetlands and intermittent and perennial streams that would include maintaining the existing riparian vegetation when possible. Therefore, the Project effects to wetlands and riparian vegetation would result in negligible to minor adverse impacts to migratory birds.

Although construction and operation of the Project may reduce the foraging potential on the Project Site, the Project is not anticipated to have an adverse impact on migratory birds that require open country with scattered trees and shrubs, such as the Bachman's sparrow, field sparrow, and prairie warbler. Similar habitat is available adjacent to the Project Site, within Lawrence County, and within adjacent counties, and would likely absorb displaced individuals.

Approximately 95 acres of forested area would be cleared to minimize shading of the solar panels on the Project Site. Impacts on forested areas, which provide habitat for species such as the Kentucky warbler, prothonotary warbler, rusty blackbird, and wood thrush would occur. Approximately 777 acres of similar habitat on the Project Site would remain and similar habitat is available throughout Lawrence County; therefore, the Project would have minor adverse impacts on these species. Any effects would be limited in scale relative to the surrounding available habitat.

Overall, while the implementation of the Project would reduce habitat for some migratory bird species, particularly those occupying crop fields and open grassland habitats, the impacts on migratory birds, while adverse, would be localized and minor. Additionally, agricultural management on land that is currently being used for row cropping on portions of the Project Site would be discontinued during the Project lifetime leading this land to eventually succeed from cropland to shrubland and eventually forest. This succession would lead to an increase in available forested habitat and benefit migratory bird species.

3.5.2.2.3.2 TL Upgrade Areas

Potential habitat exists for bald eagles and ospreys along L5832 and L5669 as they may nest on TL structures. Two osprey nests were observed on utility poles on the northwestern portion of the TL Upgrade Areas. Prior to construction activities, TVA would perform an aerial nest survey of each pole structure to identify active raptor nests, and if identified, TVA would engage USDA-Wildlife Services or USFWS as appropriate to provide guidance on avoidance and minimization measures and ensure compliance under federal law prior to commencement of work. With these measures, Project actions would not impact bald eagles or ospreys. Potential impacts on other migratory birds are similar to what is described for the Project Site in Section 3.5.2.2.1.3.

3.5.2.2.4 Aquatic Life

3.5.2.2.4.1 Project Site

Under the Proposed Action Alternative, impacts to aquatic life are expected to be minor or negligible. SMZs would be established and maintained around streams and wetlands, as described in Section 2.5.1.3. The SMZs and other BMPs would minimize erosion and sedimentation and pesticide runoff during construction and operations.

Ephemeral streams and WWCs documented on the Project Site only flow in response to precipitation events and do not support aquatic life. Ground disturbances surrounding ephemeral streams and WWCs, in the form of installing small-diameter PV array pilings and trenching for installation of electrical cables, would be relatively minimal, and BMPs would be implemented to prevent or reduce surface water runoff from carrying suspend solids into adjacent waterbodies (TVA 2022a).

3.5.2.2.4.2 TL Upgrade Areas

Streams present near the TL structures or intersected by access roads associated with the TL upgrades have the potential to be impacted from surface water runoff increasing siltation to those receiving waters. Ground disturbance would be minimized, and all work would be conducted in accordance with BMPs outlined in TVA's BMP manual (TVA 2022a). Therefore, impacts to the aquatic ecology of streams in association with the TL upgrades would be minor and insubstantial. Furthermore, applicable CWA Section 404 and 401 permits would be obtained from USACE and ADEM for any stream alterations located in the TL Upgrade Areas, and application of the terms and conditions of these permits would minimize these impacts. The permits may also require compensatory mitigation.

3.5.2.2.5 Threatened and Endangered Species

3.5.2.2.5.1 Plants

Suitable habitat for 17 federally or state-listed plant species of conservation concern was observed on the Project Site and TL Upgrade Areas. Clearing of up to 95 acres of forested areas on the Project Site could reduce habitat for the Allegheny-spurge, large whorled pogonia, mountain camellia, narrow-leaved glade fern, price's potato-bean, puttyroot, roundleaf catchfly, southern twayblade, and sweet pinesap. However, none of these plant species including the federally listed price's potato-bean were observed during surveys and most of the Project Site is unlikely to support threatened and endangered plant life due largely to active agriculture and high incidence of non-native vegetation. In addition, the forested areas that contain moderate to high suitability for protected plants would be avoided. Thus, impacts to federally and state-listed species of conservation concern including price's potato-bean are anticipated to be negligible to minor. Development on barren land and vegetation management to reduce solar panel shading on the Project Site could impact Eggert's sunflower; however, vegetation management within the TL ROW could provide habitat for this species and effects to this species are anticipated to be negligible to minor. The Project would establish SMZs surrounding wetlands and intermittent and perennial streams that would include maintaining the existing riparian vegetation when possible, which could minimize impacts to the Canada lily, Elliot's fan-petal, Goldie's woodfern, log fern, and white trout lily. Habitat for these species also exists elsewhere on the Project Site and along the TL Upgrade Areas, therefore, the Project effects to these species are anticipated to be negligible to minor.

3.5.2.2.5.2 Mammals

Although the implementation of the Project would reduce habitat for the eastern spotted skunk, the effect on this species would be localized and are considered minor as approximately 777 acres of suitable forested habitat and 1,651 acres of cropland habitat would remain on the Project Site. Further, proposed areas to be areas would be allowed to revegetate with grasses and would also provide suitable habitat for this species. Additionally, agricultural management would cease on some land adjacent to the developed areas during the Project lifetime leading this land to change from cropland to grassland. Furthermore, some cropland areas located in eastern portion of the Project Site would be allowed to succeed to shrubland and eventually forest. This succession would compensate for some forested habitat lost to the development of the Project and these land use changes may benefit the eastern spotted skunk. Habitat for this species could also occur in the TL Upgrade Areas; however, impacts are unlikely as the species would likely move to the surrounding areas during TL upgrade activities.

Suitable summer roosting and foraging habitat exists for the Project bat species with the exception of the gray bat. Suitable foraging habitat exists for the gray bat. One tricolored bat and two gray bats were caught during an on-site mist net survey conducted in August 2023. The tricolored bat was tracked to three different summer roosting trees on the Project Site. However, only two of the three trees remain, as one of the trees was knocked down by a storm. The remining two trees (roosting trees) are located in the eastern portion of the Project, where no tree clearing activities are proposed. Tree clearing would occur in other forested areas of the Project Site and would be conducted during the winter season (October 1 to March 14) to minimize direct impacts to Project bat species and migratory birds. Tree clearing activities would occur within a 1.5-mile buffer around roosting trees only during the winter clearing season (October 1 to March 14).

In compliance with Section 7 of the ESA, TVA is consulting with USFWS on potential effects of the Proposed Action on federally listed bat species and final correspondence will be included with the final EIS. Minimal to moderate impacts are anticipated for the Project bat species based on the results of the habitat assessments and mist-net surveys. This determination also accounts for the presence of reproductively active tricolored bats. However, avoiding impacts to critical roosting habitat and adherence to tree clearing during the winter season (October 1 to March 14) is anticipated to avoid or minimize impacts to the Project bat species.

Specifically, approximately 2.1 acres of high quality, 11.0 acres of moderate quality, and 62.8 acres of low-quality summer roosting and foraging habitat for Project bat species totaling 76 acres would be permanently removed from the Project Site. Approximately 223 acres of high quality, 178.0 acres of moderate quality, and 271.2 acres of low-quality summer roosting and foraging habitat totaling 672 acres would remain on the Project Site. During operation of the solar facility, some summer roosting and foraging habitat for bat species would remain (Table 3-20).

Table 3-20. Summary of bat habitat impacts on the Project Site

Habitat Quality	Bat Habitat Impacts (acres)	Bat Habitat Remaining (acres)	Total Bat Habitat (acres)
High	2.1	222.9	225.3
Moderate	11.0	178.0	189.4
Low	62.8	271.2	334.0
Total	**75.9**	**672.1**	**748.7**

Some areas of suitable bat foraging habitat were observed in the TL Upgrade Areas. However, no tree clearing is anticipated in the TL Upgrade Areas and tree maintenance activities such as limbing are anticipated to occur during the winter clearing season (October 1 to March 14), therefore impacts to protected bat species are not anticipated from TL upgrade activities.

3.5.2.2.5.3 Birds

Suitable habitat for the two federally listed bird species (red-cockaded woodpecker and whooping crane) was not observed on the Project Site or TL Upgrade Areas and these species would not be affected (Table 3-17).

3.5.2.2.5.4 Reptiles

Forested wetlands on the Project Site provide suitable habitat for the coal skink. Habitat could be impacted as approximately 1.62 acre of forested wetlands may be converted to emergent wetlands on the Project Site; however, similar suitable habitat is available on and adjacent to the Project Site. Impacts to habitat for the coal skink are expected to be minimal to negligible.

Suitable habitat for the alligator snaping turtle was not observed on the Project Site or TL Upgrade Areas.

3.5.2.2.5.5 Aquatic Species

Potential habitat for the slackwater darter, Tuscumbia darter, Bankhead darter, slender madtom, and stripetail darter was observed on the Project Site in Wheeler Branch. Only the Tuscumbia darter was observed in Wheeler Branch during aquatic surveys. Impacts to Wheeler Branch and its 70-foot SMZ would be avoided; therefore, the Project would not impact fish species of conservation concern.

Suitable habitat for the two state-listed crustacean species of conservation concern was not observed on the Project Site or TL Upgrade Areas (Table 3-18).

Fourteen species of aquatic mollusks of conservation concern (ten mussels and four snails) have the potential to occur on the Project Site and TL Upgrade Areas. No impacts to perennial or intermittent streams are anticipated; therefore, the Project would not impact these species. Additionally, the round-rib elimia was encountered in Wheeler Branch during the aquatic surveys. Impacts to Wheeler Branch and its 70-foot SMZ would be avoided; therefore, the Project would not impact the round-rib elimia.

3.5.2.2.5.6 Insects and Arachnids

On the fringes of the Project Site, while milkweed host plants were not observed, other flowering plants that provide suitable foraging habitat for the monarch butterfly were observed. The solar facility would generally not be developed in these areas and would include up to 50 acres of species-rich native plant meadows to promote pollinators. Therefore, minimal to negligible adverse impacts to the monarch butterfly are anticipated. Additionally, the benefits of the establishment and maintenance of the species-rich native plant meadow would outweigh any temporary adverse impacts to the monarch butterfly. Foraging habitat for the monarch butterfly was observed in the TL Upgrade Areas and minimal to negligible impacts are anticipated as TL ROW management would maintain low-growing plants, suitable habitat for this species.

Twelve species of caddisflies of conservation concern have potential to occur in perennial streams on the Project Site. No caddisfly species were observed during aquatic surveys. Impacts to perennial streams and associated SMZs would be avoided; therefore, impacts to these species are not anticipated.

One state-listed pseudoscorpion species has potential to occur on the Project Site. While this species was not observed during surveys, the small size of the species typically precludes observation. Removal of up to 95 acres of forested areas could impact suitable habitat for the pseudoscorpion. Similar suitable habitat is available within and adjacent to the Project Site.

3.5.2.3 Cumulative Impacts

The Project Site and TL Upgrade Areas are generally situated in rural areas consisting of agricultural land. Since agriculture is the dominant land use in the areas suited for development, future development would likely not result in significant impacts to important terrestrial habitats. While RFFAs such as the adjacent North Alabama Utility-Scale Solar Facility and development of the industrial parks (up to 5,270 acres) in the surrounding region could remove available habitats for wildlife in the foreseeable future, the impacts of the Project would not result in significant cumulative impacts to vegetation and wildlife due the amount of similar habitat in areas immediately adjacent to the Project Site and the type of forest and other vegetative communities to be removed. The Project would likely not result in significant cumulative impacts to threatened and endangered terrestrial wildlife, aquatic species, and plant species given the Proposed Action would result in minor impacts to federally listed species and no impacts to state-listed species of conservation concern.

3.6 Natural Areas, Parks, and Recreation

3.6.1 Affected Environment

Natural areas include managed areas such as wildlife management areas (WMAs), national wildlife refuges, habitat protection areas, ecologically significant sites, and streams listed on the Nationwide Rivers Inventory due to their high scenic, recreational, and other values. Parks and recreation facilities include boat ramps, community centers, swimming pools, and other public and private places devoted to recreation. This section addresses the natural areas, parks, and recreation areas that are on, immediately adjacent to (within 0.5 mile), or within five miles of the Project Site and within or immediately adjacent to the TL Upgrade Areas (Figure 3-25).

3.6.1.1 Project Site

There are no natural areas or developed parks on the Project Site. Dispersed recreation activities, such as hunting and fishing, are currently not allowed on the Project Site. The Wheeler Dam Tailwater Restricted Mussel Harvest Area is approximately 0.1 mile [direction] of the Project Site. The Wheeler Reservoir and the Roy Coffee ballpark are approximately 0.5 mile north and 0.5 mile west of the Project Site, respectively. The Mallard-Fox Creek Wildlife Management Area (WMA) is approximately two miles northeast of the Project Site. Designated critical habitat for the endangered fleshy-fruit gladecress is approximately 3.4 miles southeast of the Project Site. Mallard Creek Fish Camp, Mallard Creek Recreation Area, and Lawrence County Park are three miles northeast, 3.5 miles northeast, and five miles north of the Project Site, respectively. Lake View Boat Ramp and Pleasant Grove Boat Ramp are 3.5 miles northeast and 3.5 miles northwest of the Project Site, respectively.

Wheeler Reservoir is currently managed for multiple uses, including wildlife habitat and various public recreation activities including boating, fishing, and camping. The Mallard-Fox Creek WMA is managed by the Alabama Department of Conservation and Natural Resources and Division of Wildlife & Freshwater Fisheries for hunting and fishing purposes. Except for the ballpark, all the recreation areas are associated with the Wheeler Reservoir.

3.6.1.2 TL Upgrade Areas

The northern terminus of the TL Upgrade Areas is within Joe Wheeler State Park. Wheeler Reservoir and Wilson Reservoir are adjacent to the northern terminus of the TL Upgrade Areas.

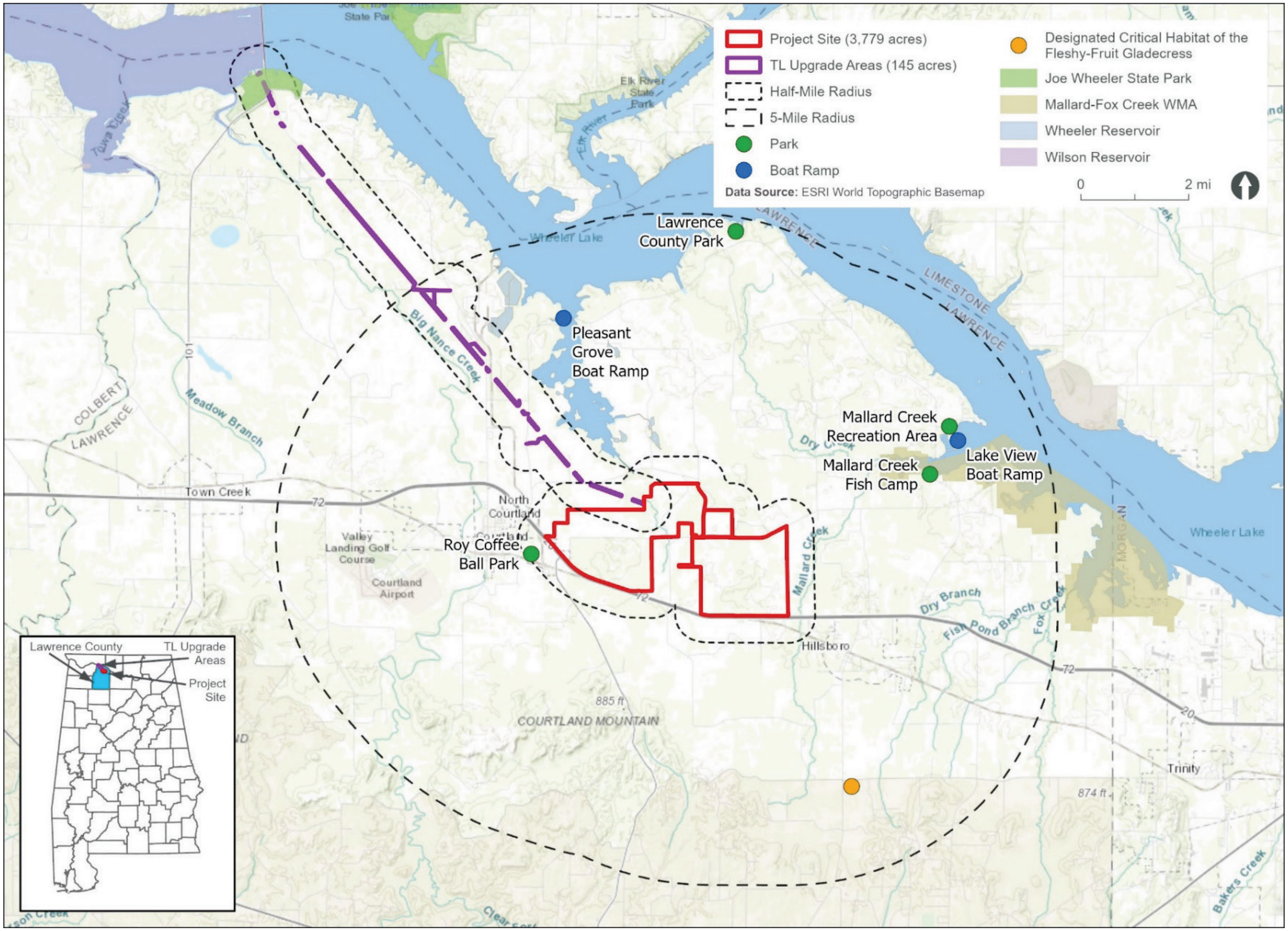

Figure 3-25. Natural areas, parks, and recreation in the vicinity of the Project Site and TL Upgrade Areas

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to natural areas, parks, and recreation would occur.

3.6.2.2 Proposed Action Alternative

3.6.2.2.1 Project Site

Under the Proposed Action Alternative, the proposed solar facility would be constructed. Roy Coffee ballpark would experience heightened noise during construction, primarily from pile-driving activities. Pile-driving for installation of PV arrays would occur over a six-to-12-month period and would be scheduled during daylight hours Monday through Friday and occasionally on Saturdays when the schedule requires to minimize impacts to Roy Coffee ballpark. Overall, implementation of the Proposed Action would result in minor, temporary adverse impacts to the ambient noise environment at Roy Coffee ballpark during construction of the solar facility.

3.6.2.2.2 TL Upgrade Areas

The northern terminus of the TL Upgrade Areas is within Joe Wheeler State Park. Wheeler Reservoir and Wilson Reservoir are adjacent to the northern terminus of the TL Upgrade Areas. Visitors to Joe Wheeler State Park, Wheeler Reservoir, and Wilson Reservoir can take part in various public recreation activities including boating, fishing, and camping. A helicopter would be visible to the Joe Wheeler State Park, Wheeler Reservoir, and Wilson Reservoir visitors during the installation of OPGW. Any road closures necessary for TL upgrade activities would be brief and would not restrict access to recreation areas. Therefore, TL upgrade activities would have minor temporary impacts on recreation.

3.6.2.3 Cumulative Impacts

The RFFAs such as the adjacent North Alabama Utility-Scale Solar Facility and development of the industrial parks (up to 5,270 acres) would reduce the suitability of lands for recreation within Lawrence County. This would decrease the amount of potentially available land to support dispersed outdoor recreation activities such as hunting, fishing, and nature observation. The combined effect of these future land development actions and the Project would likely result in a reduction in resources for dispersed recreation. Due to relatively large amounts of rural and undeveloped lands within the county, cumulative impacts on dispersed recreation opportunities would likely be minor to moderate.

3.7 Visual Resources

3.7.1 Affected Environment

Visual resources are composed of the visible character of a place and include both natural and human-made attributes. Visual resources influence how an observer experiences a particular location and distinguishes between locations. Such resources are important to people living in or traveling through an area and can be an essential component of historically and culturally significant settings. For this analysis, the scenery management system and associated analytical assessment procedures developed by the U.S. Forest Service are adapted for use within a natural and human-built environment and integrated with planning methods used by TVA (TVA 2016; USDA 1995). The general Project Site viewshed is evaluated based on scenic attractiveness and scenic integrity. Scenic attractiveness is a measure of the scenic beauty of a landscape based on perceptions of the visual appeal of landforms, waterways, vegetation, and the human-built environment.

Scenic attractiveness is assessed as either distinctive, typical/common, or indistinctive. As adapted for this analysis, scenic integrity measures the degree of visual unity of the natural and cultural character of the landscape. Scenic integrity is evaluated as either low, moderate, or high. This analysis also considers the existing character of the Project Site as an important factor in understanding the affected environment.

3.7.1.1 Project Site

The Project Site is within a rural agricultural area with isolated single-family homes, small rural-residential concentrations, and some commercial and industrial development adjacent to highways. The Project Site generally consists of gently sloping terrain with elevations ranging from approximately 570 to 620 feet above mean sea level. Scenic attractiveness of the general Project Site viewshed is rated as typical or common of a rural agricultural and rural residential area. Scenic integrity is assessed as moderate to high due to the relative unity of the surrounding natural and cultural character. Figure 3-26 and Figure 3-27 show general views of the Project Site.

Figure 3-26. Agricultural land on the Project Site

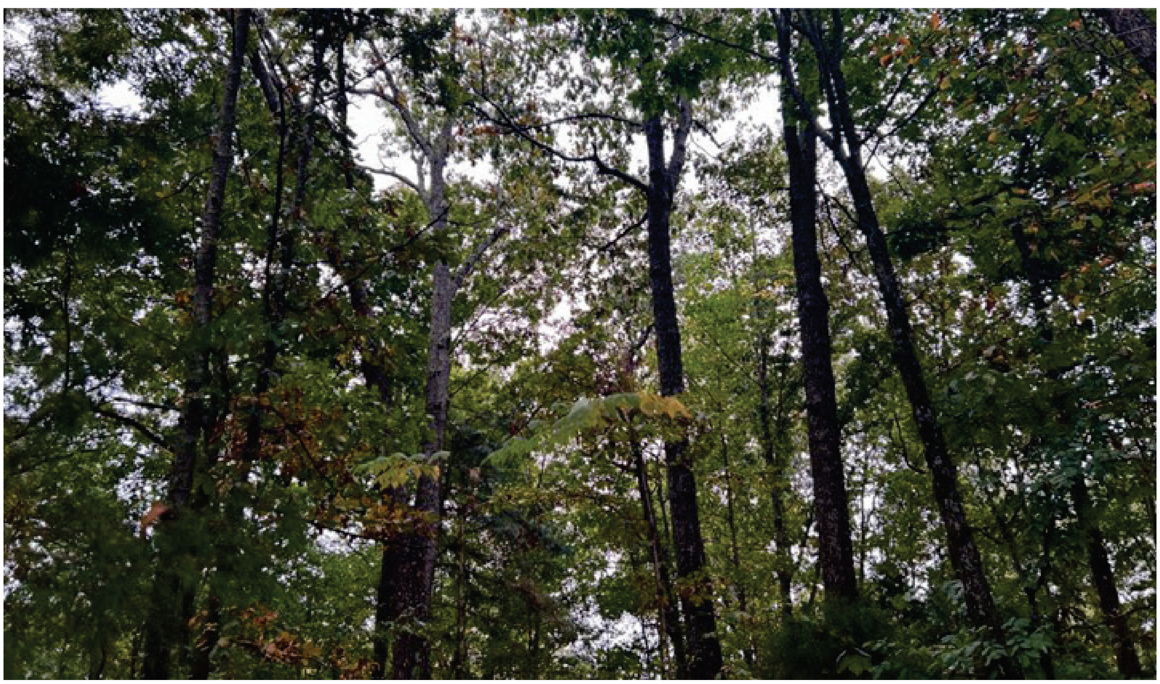

Figure 3-27. Forested land on the Project Site

A visual receptor, also known as a viewpoint, is a point within the line of sight of the source. There are a total of 249 viewpoints within 0.5 mile of the Project Site, most being residences and vacant buildings (Table 3-21; Figure 3-28). Some of the viewpoints identified may be out of the line of sight due to intervening woodlands or terrain differences that were not accounted for in this analysis.

Table 3-21. Viewpoints within 0.5 mile of the Project Site

Viewpoint Type	Number of Viewpoints
Business	5
Church	4
Farm Building	26
Industrial	23
Residential	79
School	0
Sports Field	3
Vacant Buildings (garage/shed)	85
Unknown	24
Total	**249**

Prominent viewpoints surrounding the Project Site, where more concentrated visual effects from the Project could be observed, include a small rural-residential concentration along CR 387 (Browns Ferry Road) and traffic along US 72A/SR 20, Browns Ferry Road, and CR 420. (Table 3-22; Figure 3-28).

Table 3-22. Viewpoints in the vicinity of the Project Site

Location	Description	Viewpoint Type	Views to Project Site
US 72A/SR 20	Four-lane divided federal highway that extends northwest–southeast along the southern boundary of the Project Site.	Traffic	Partially obscured by mixed deciduous trees in fencerows and woodlots
Browns Ferry Road	Rural two-lane paved public road that extends east–west through the central portion of the Project Site. Provides access to the Project Site via its connection with CR 377 to the west.	Rural-residential concentration Traffic	Partially obscured by mixed deciduous trees in fencerows and woodlots
CR 420	Rural two-lane public road that extends north–south through the northeastern portion of the Project Site. Provides access to the Project Site via a connection with Browns Ferry Road to the south and CR 388 to the north.	Traffic	Partially obscured by mixed deciduous trees in fencerows and woodlots

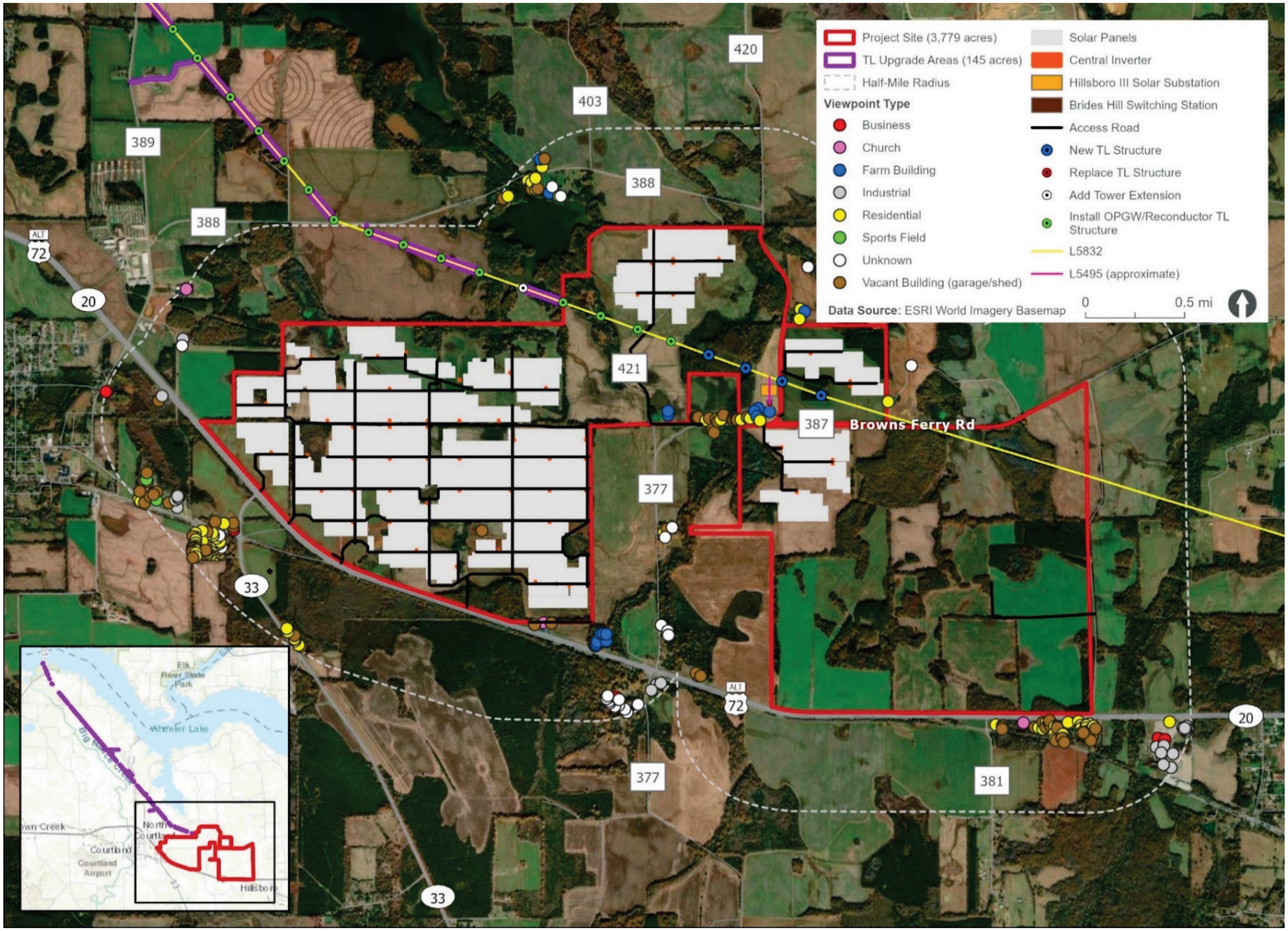

Figure 3-28. Viewpoints in the Project Site vicinity

3.7.1.2 TL Upgrade Areas

The TL Upgrade Areas are within a rural agricultural area with isolated single-family homes, small rural-residential concentrations, and some commercial and industrial development adjacent to highways and generally consists of gently sloping terrain with elevations ranging from approximately 550 to 590 feet above mean sea level. Scenic attractiveness of the area's viewshed is rated as typical or common of a rural agricultural and rural residential area. Scenic integrity is assessed as moderate to high due to the relative unity of the surrounding natural and cultural character. Figure 3-29 and Figure 3-30 show general views of the TL Upgrade Areas.

Figure 3-29. Pastureland on the TL Upgrade Areas

Figure 3-30. Herbaceous-shrub/scrub land on the TL Upgrade Areas

There are a total of 274 viewpoints within 0.5 mile of the TL Upgrade Areas, most being residences and vacant buildings (Table 3-23; Figures 3-35, 3-36, and 3-37). Some of the viewpoints identified may be out of the line of sight due to intervening woodlands or terrain differences that were not accounted for in this analysis.

Table 3-23. Viewpoints within 0.5 mile of the TL Upgrade Areas

Viewpoint Type	Number of Viewpoints
Business	8
Church	1
Farm Building	24
Industrial	35
Residential	108
School	0
Sports Field	3
Vacant Buildings (garage/shed)	69
Unknown	26
Total	**274**

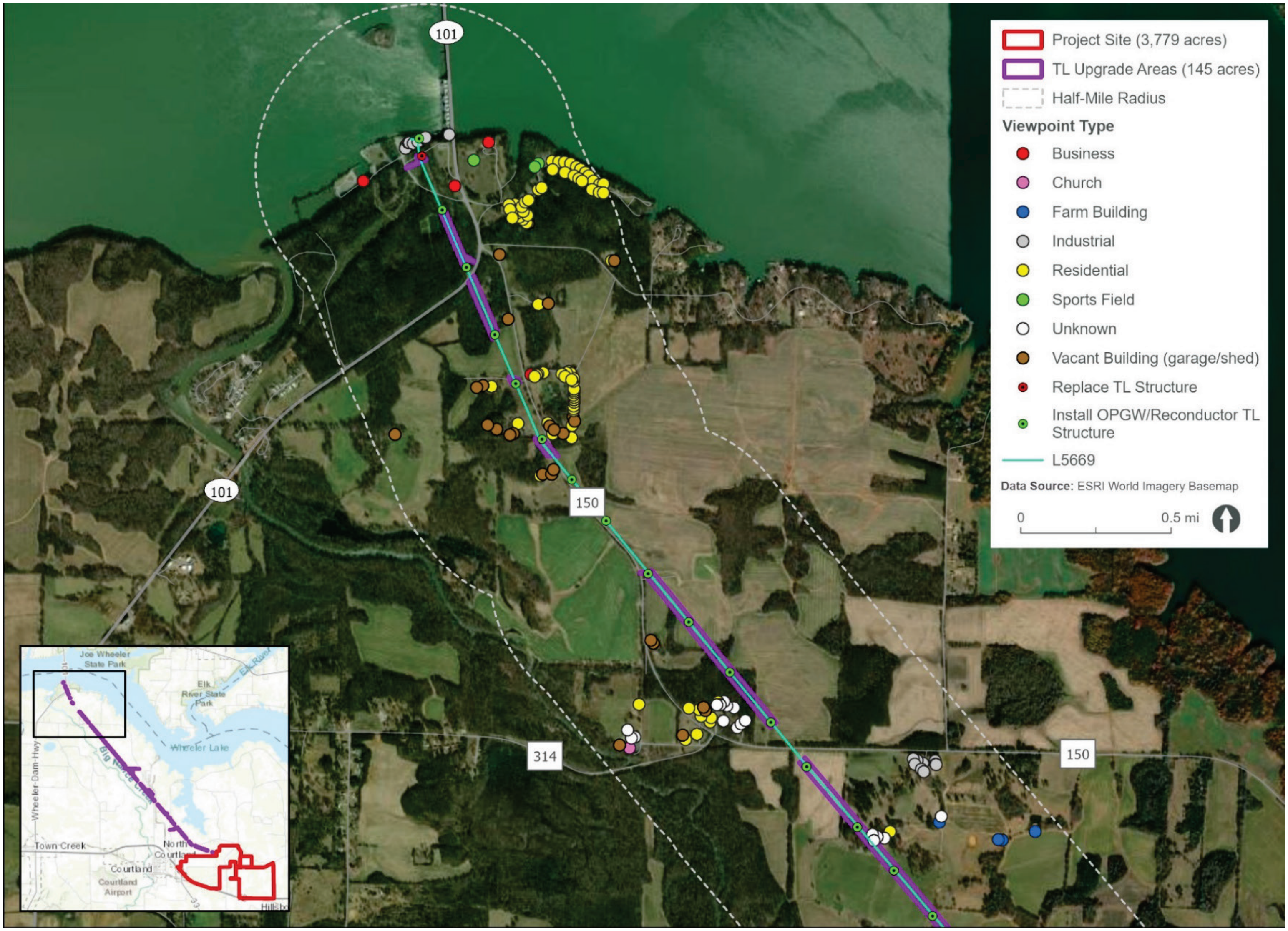

Figure 3-31. Viewpoints in the vicinity of the northern portion of the TL Upgrade Areas

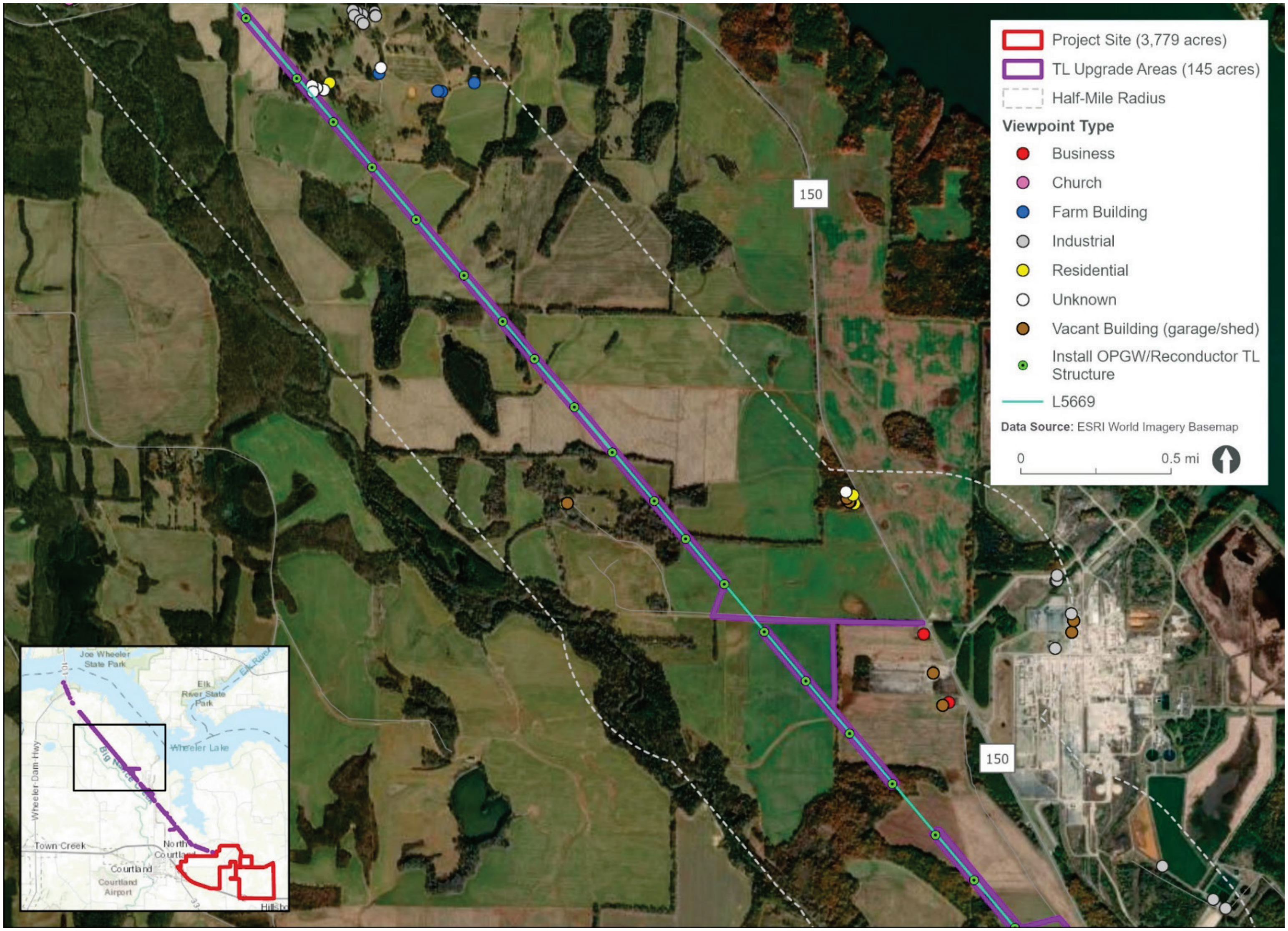

Figure 3-32. Viewpoints in the vicinity of the central portion of the TL Upgrade Areas

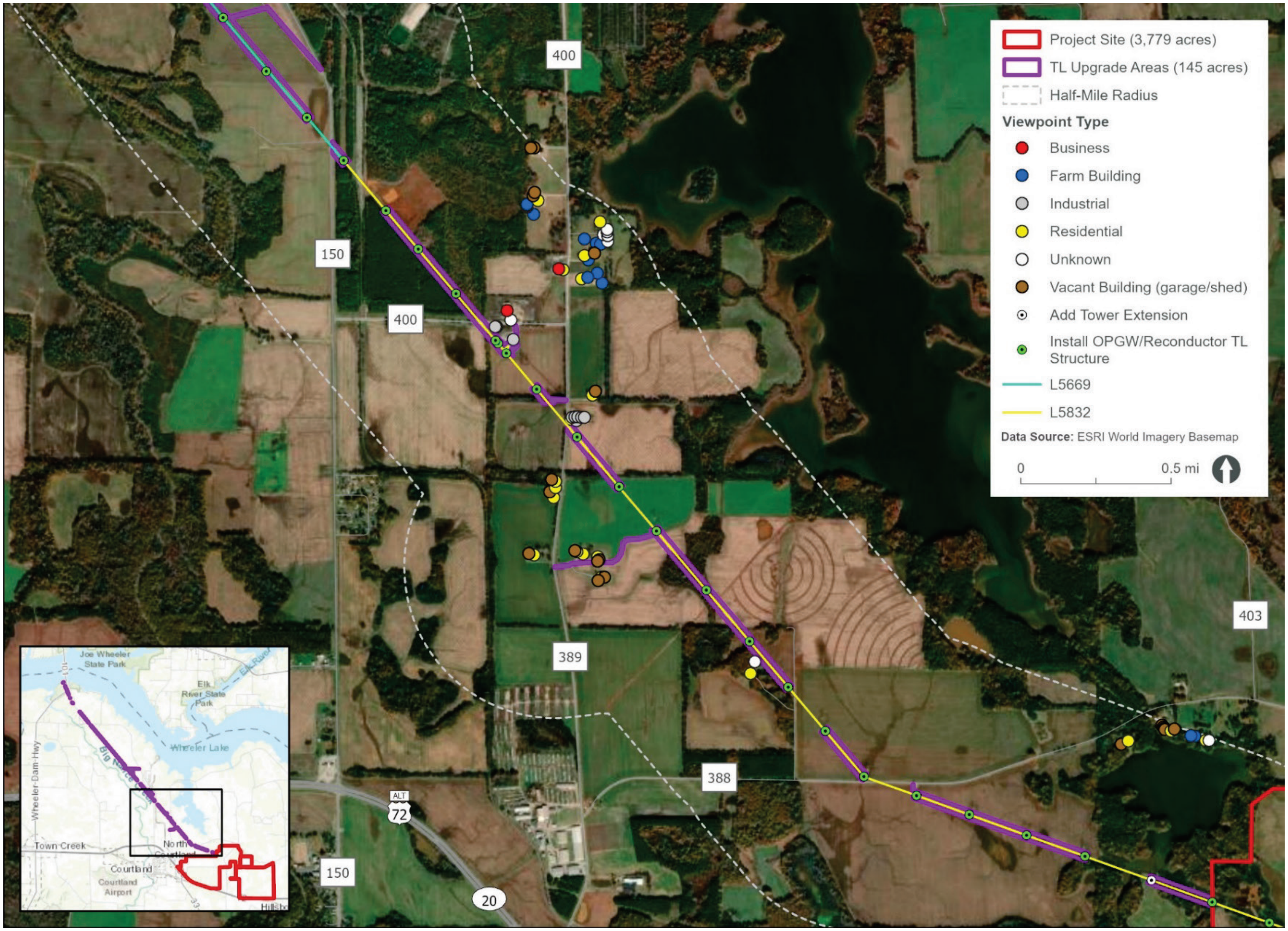

Figure 3-33. Viewpoints in the vicinity of the southern portion of the TL Upgrade Areas

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 visual resources would result. Existing views of the Project Site, primarily agricultural land, would remain relatively unchanged. Visual changes may occur over time as vegetation on the Project Site changes. For example, if the Project Site were no longer cultivated or mowed, vegetation would change from low-profile plants to shrubs and trees.

3.7.2.2 Proposed Action Alternative

3.7.2.2.1 Project Site

Under the Proposed Action Alternative, Hillsboro Solar, LLC would construct and operate a 200-MW AC single-axis tracking PV solar facility. Visual concerns are often associated with solar facilities and their electrical infrastructure. The Project Site generally consists of gently sloping agricultural land with woodlots and forested fencerows bordering parts of the Project Site. Construction of the proposed facilities would convert what is currently primarily agricultural land to an industrial use mostly consisting of low-profile PV arrays. Figure 3-28 shows the proposed Project elements and the locations of nearby viewpoints from which Project elements may be visible. Figure 3-34 and Figure 3-35 show representative views of the type of solar panels proposed for the Project. In the morning, when panels would be facing east, the more pronounced visual effects of the glossy front PV panel surfaces would largely occur from viewpoints to the east of the Project Site, along US 72A/SR 20 and Browns Ferry Road. In the evening, when panels would be facing west, the more pronounced visual effects would largely occur from viewpoints to the west of the Project Site, along US 72A/SR 20, Browns Ferry Road, and CR 420.

Figure 3-34. Single-axis, tracking photovoltaic system with panels near maximum tilt as viewed from the east or west

Figure 3-35. The backside of the solar panels in early morning or late afternoon configuration

Construction activities would temporarily alter the visual character of the Project Site. During construction, heavy machinery would be present, changing the appearance from area viewpoints. Within the area to be developed for the Project, trees and other tall vegetation would be removed, and portions of the area would be graded, changing the contour, color, and texture of the scenery attributes. During and after grading, the Project Site would appear as a mixture of neutral colors such as browns and grays due to earthmoving, road construction, and concrete activities. Water would be used to keep soil from aerosolizing; thus, dust clouds are not anticipated. Visual impacts from construction would be minimal at night, because most construction is anticipated to occur during the day. Overall, there would be minor direct and indirect impacts to visual resources on the Project Site during the construction phase. These impacts would occur over a 24–36-month period, subject to weather.

The manufactured, structured appearance of the built facility would be most apparent from viewpoints surrounding the Project Site along US 72A/SR 20, Browns Ferry Road, and CR 420. Lawrence County does not have ordinances related to the construction and operation of solar facilities; however, to minimize impacts to travelers along US 72A/SR 20 and in a practice of caution, Hillsboro Solar, LLC would implement a 300-foot solar facility setback from US 72A/SR 20. The perimeter of the eight large blocks of facility components, Hillsboro III Solar substation, and Bride’s Hill switching station would be enclosed with six-foot-tall chain-link security fencing topped with three strands of barbed wire.

Long-range views from the prominent viewpoints near the Project Site along US 72A/SR 20, Browns Ferry Road, and CR 420 are partially obscured by mixed deciduous trees in fencerows and woodlots. Because most of the mature tree buffers are comprised of deciduous trees, their effectiveness in blocking views of the Project would be reduced from late autumn through early spring. Long-range views from travelers along US 72A/SR 20 are partially obscured by mixed deciduous trees in fencerows and woodlots except for several portions along the southwestern boundary of the Project Site, where Project elements would be visible. Project elements would also be visible from portions of Browns Ferry Road and CR 420. Although the anti-reflective PV panel surfaces would minimize glare and reflection, visual impacts to travelers along US 72A/SR 20, Browns Ferry Road, and CR 420 are expected to be moderate due to the visibility of relatively large portions of the Project elements.

Hillsboro Solar, LLC and TVA propose to construct the Hillsboro III Solar substation and Bride's Hill switching station, respectively, to connect the solar PV facility to TVA's existing L5832. The Hillsboro III Solar substation would encompass three acres in the northern portion of the Project Site and the Bride's Hill switching station would encompass 0.7 acre adjacent to the Hillsboro III Solar substation. The industrial appearance of the substation and switching station would be most apparent to travelers along Browns Ferry Road and CR 420. Lighting at the substation and switching station would be downward-facing, timer-and/or motion-activated, and low glare to minimize impacts to surrounding areas.

The visual alteration from agricultural land in an area where scenic attractiveness is rated as typical or common and scenic integrity is rated as moderate to high due to the relative unity of the surrounding natural and cultural character to a large solar facility would likely result in moderate adverse visual impacts. The scenic attractiveness rating would change to indistinctive of a rural agricultural and rural residential area and the scenic integrity rating would change to low to moderate. The establishment of the narrow strips of species-rich native plant meadow areas surrounding or adjacent to blocks of solar arrays could partially offset the visual impacts, although it would not obscure the adjacent security fencing or nearby solar arrays in early morning or late afternoon. Overall, the visual effects of the built facility would likely be moderate due to, in many instances, the unobstructed visibility of portions of the Project elements. Visual effects from the Project would be minor on a larger scale, due to variation of the visual attributes of the Project Site as distance from the Project increases.

3.7.2.2.2 TL Upgrade Areas

TVA would install approximately five and seven miles of OPGW on L5832 and L5669, respectively. These portions of the TLs extend through a mix of rural agricultural areas with isolated single-family homes, small rural-residential concentrations, and some commercial and industrial development adjacent to highways. A helicopter would be visible to these residences during the installation of OPGW in the vicinity. Other equipment associated with the TL upgrades may also be visible. TVA would install the new up to 700-foot-long L5495 between the Hillsboro III Solar substation/Bride's Hill switching station and L5832. The substation, switching station, and L5495 would likely be visible to some residences along Browns Ferry Road. Overall, the TL upgrade work would likely result in temporary, minor to moderate impacts to the scenery at viewpoints in the vicinity of the TL upgrade locations and long-term moderate impacts to scenery at viewpoints in the vicinity of the substation, switching station, and L5495.

3.7.2.3 Cumulative Impacts

The Proposed Action would alter the visual character of the Project Site by converting a large area of agricultural land to numerous low-profile parallel rows of PV panels, a substation, and a switching station. Much of the developed Project Site would not be visible from nearby public roads and residences. The visual impacts at other locations around the

Project Site perimeter would be minor to moderate and mostly at middle-ground distances. The development of the adjacent North Alabama Utility-Scale Solar Facility would similarly alter the visual character of the Project vicinity by converting a large area (approximately 1,459 acres) of primarily agricultural land to numerous low-profile parallel rows of PV panels, a substation, and an energy storage facility. The development of the industrial parks in the area surrounding the Project Site (over 3,800 acres) are RFFAs that could result in greater visual impacts due to the size of the buildings and supporting infrastructure. Because the visual impacts of the Proposed Action would be comparatively minor to moderate but localized, the Proposed Action has the potential to result in minor to moderate adverse cumulative visual impacts.

3.8 Noise

3.8.1 Affected Environment

Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). The human ear does not perceive all sound frequencies equally well. Therefore, measured sound levels are adjusted or weighted to correspond more closely to noise perceived by human hearing. The adjusted noise metric that most closely duplicates human perception of noise is known as the A-weighted decibel (dBA). The threshold of human hearing is zero decibels (dB), and the threshold of discomfort or pain is around 120 dB.

A day-night average sound level (L_{dn}) is a 24-hour noise descriptor used to assess noise impacts for land uses where people sleep and there is a heightened sensitivity to nighttime noise. The L_{dn} noise metric is recommended by USEPA and has been adopted by most federal agencies (USEPA 1974). An L_{dn} of 65 dBA is the threshold level most commonly used for noise planning purposes, representing compromise between community impact and the need for activities such as construction.

Areas exposed to an L_{dn} above 65 dBA are generally not considered suitable for residential use. An L_{dn} of 55 dBA was identified by USEPA as a level below which there is no adverse impact (USEPA 1974). Common noise levels from various noise sources are shown in Figure 3-36 (Sygrove 2024).

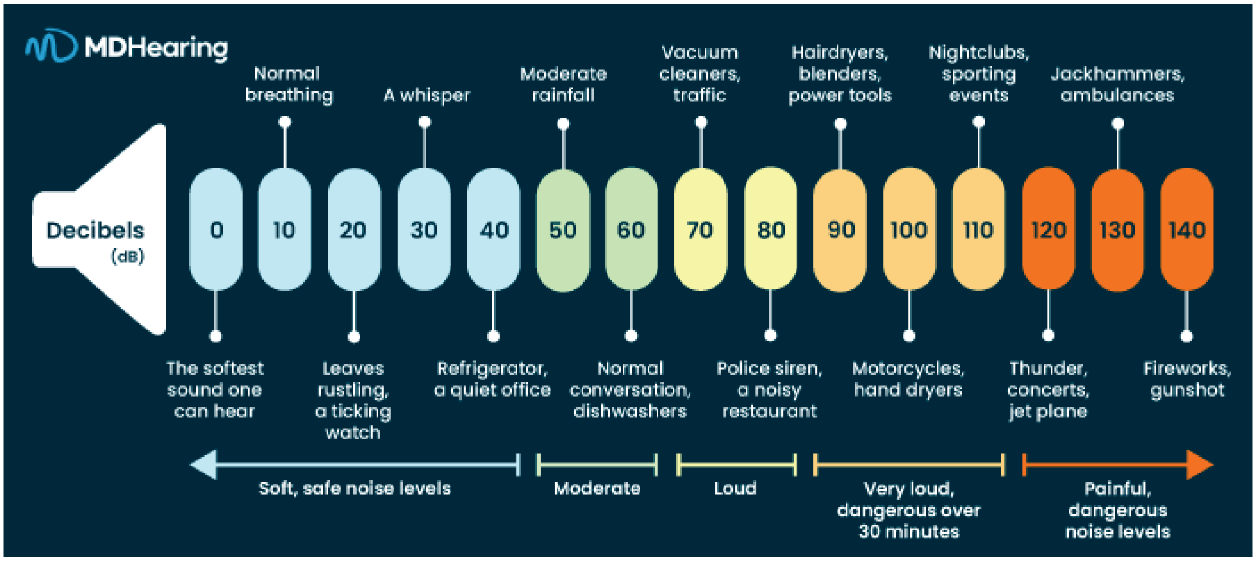

Figure 3-36. Common noise levels

3.8.1.1 Project Site

The Project Site is primarily agricultural fields used for cultivating cotton, soybeans, and corn. Ambient noise at the Project Site consists mainly of agricultural sounds, such as noises from farm machinery; natural sounds, such as from wind and wildlife; and moderate to low traffic sounds. Noise levels of these types generally range from 45 to 55 dBA (USDOT 2006). Traffic noise levels along US 72A/SR 20, which extends northwest–southeast along the southern boundary of the Project Site, likely range from 70 to 80 dBA at a distance of 50 feet (Corbisier 2003). A Norfolk Southern rail line parallels the south side of US 72A/SR 20, approximately 160 feet south of the Project Site. Noise from freight trains traveling at 20 miles per hour measures around 88 dBA at a distance of 50 feet (Southwest LRT 2015). Train horns must not exceed 110 dB to be in compliance with Federal Railroad Administration (FRA) requirements (FRA 2023).

The Project Site and a surrounding 0.5-mile radius were examined to identify potential noise-sensitive receptors. Noise-sensitive receptors are defined as those locations or areas where dwelling units or other fixed, developed sites of frequent human use occur. There are a total of 164 noise-sensitive receptors within 0.5 mile of the Project Site, most being residences (Table 3-24; Figure 3-37).

Table 3-24. Noise-sensitive receptors within 0.5 mile of the Project Site

Noise-Sensitive Receptor Type	Number within 0.5 Mile of the Project Site
Business	5
Church	4
Farm Building	26
Industrial	23
Residential	79
School	0
Sports Field	3
Unknown	24
Total	**164**

Rural-residential noise-sensitive receptors occur around the perimeter of the Project Site, ranging from less than 190 feet to approximately 1.7 miles from proposed PV array locations. The Wheeler Chapel Church, the Pleasant Grove Missionary Baptist Church, the Wheeler Grove Baptist Church, and the Bethlehem Primitive Baptist Church are 350 feet, 3,000 feet, 3,410 feet, and 1.4 miles, respectively, from the nearest proposed PV array. The nearest church to the Hillsboro III Solar substation and Bride's Hill switching station is the Wheeler Grove Baptist Church, approximately 1.4 miles southwest of the substation and switching station. The nearest business to the Project Site is located along SR 33, approximately 1,725 feet from the nearest proposed PV array.

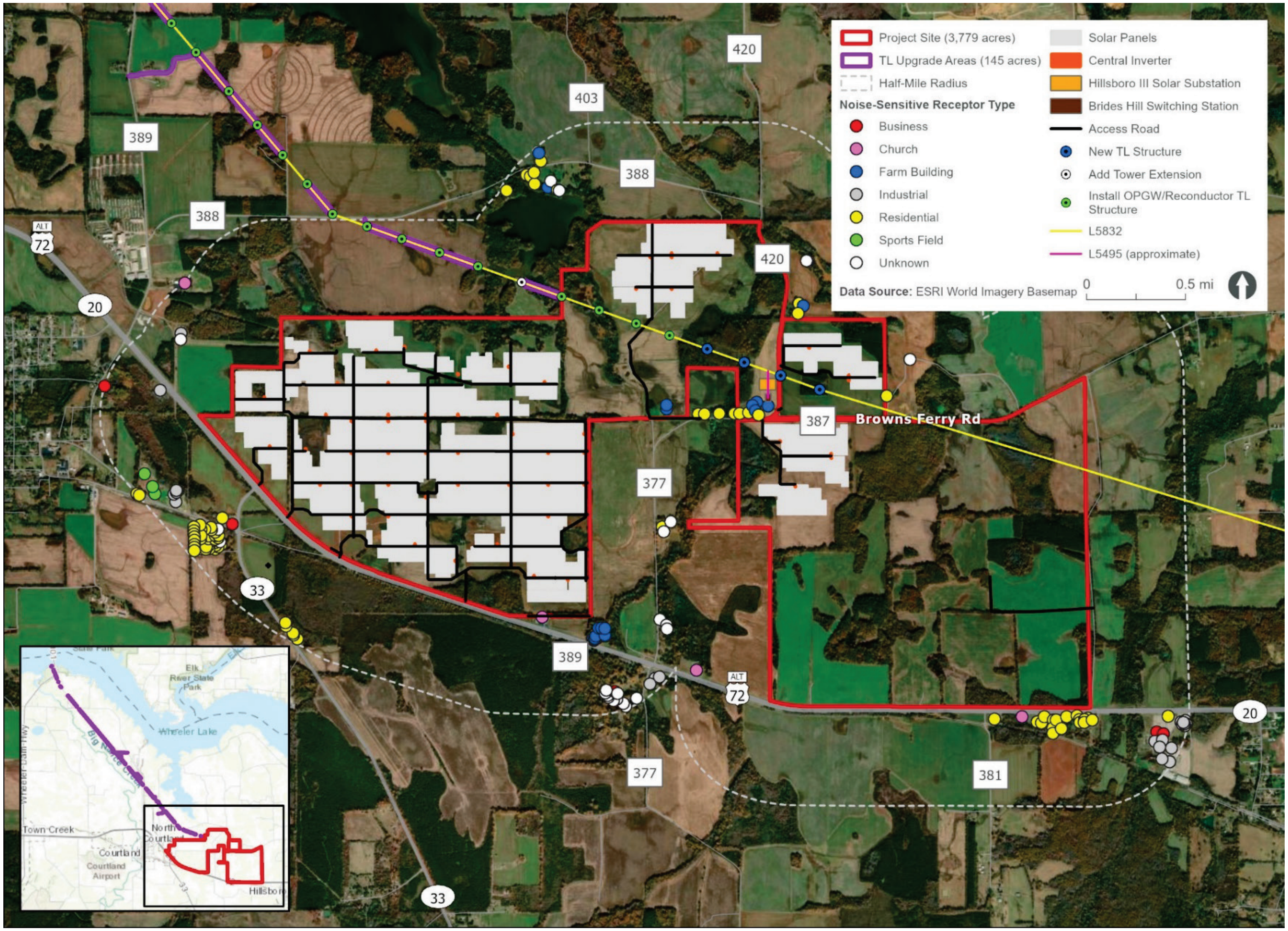

Figure 3-37. Noise-sensitive receptors in the area surrounding the Project Site

3.8.1.2 TL Upgrade Areas

The TL Upgrade Areas are primarily agricultural fields used for soybean and corn production, open pasture, and maintained TVA ROWs. Ambient noise at the TL Upgrade Areas consists mainly of agricultural sounds, such as noises from farm machinery; natural sounds, such as from wind and wildlife; and low traffic sounds. Noise levels of these types generally range from 45 to 55 dBA (USDOT 2006).

The TL Upgrade Areas and a surrounding 0.5-mile radius were examined to identify potential noise-sensitive receptors. Noise-sensitive receptors are defined as those locations or areas where dwelling units or other fixed, developed sites of frequent human use occur. There are a total of 205 noise-sensitive receptors within 0.5 mile of the TL Upgrade Areas, most being residences (Table 3-25).

Table 3-25. Noise-sensitive receptors within 0.5 mile of the TL Upgrade Areas

Noise-Sensitive Receptor Type	Number within 0.5 Mile of the TL Upgrade Areas
Business	8
Church	1
Farm Building	24
Industrial	35
Residential	108
School	0
Sports Field	3
Unknown	26
Total	**205**

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts on the ambient sound environment would occur. Existing land use would remain primarily agricultural land for the foreseeable future, and the ambient sound environment would likely remain unchanged.

3.8.2.2 Proposed Action Alternative

3.8.2.2.1 Project Site

Direct and indirect noise impacts associated with implementation of the Proposed Action would primarily occur during construction. Construction equipment produces a range of sounds. Loud construction equipment, such as delivery trucks, dump trucks, water trucks, service trucks, bulldozers, chain saws, and bush hogs produce maximum noise levels of approximately 84 to 85 dBA at a distance of 50 feet. This type of equipment would be used for approximately 24–36 months at the Project Site.

Construction noise would cause temporary and moderate adverse impacts to the ambient sound environment in the area surrounding the Project Site. Construction would primarily occur during daylight hours, between sunrise and sunset; therefore, the Project would not affect ambient noise levels at night during most of the construction period. Most of the proposed equipment would not be operating on-site for the entire construction period but would be phased in and out according to the progress of the Project.

Several residences, churches, businesses, industrial buildings, agricultural buildings, the NRHP-listed Pond Spring, and Roy Coffee ballpark would experience heightened noise during construction, primarily from pile-driving activities. Pile-driving for installation of PV arrays would occur over a six-to-12-month period and standard construction pile drivers produce 90–95 dBA at a distance of 50 feet (USDOT 2006). These noise levels would typically diminish with distance from the PV arrays at a rate of approximately six dBA per each doubling of distance. The nearest residence, Wheeler Chapel Church, Pond Spring, Roy Coffee ballpark, Pleasant Grove Missionary Baptist Church, and Wheeler Grove Baptist Church are approximately 190 feet, 350 feet, 2,500 feet, 2,800 feet, 3,000 feet, and 3,410 feet, respectively, from the nearest proposed PV array. Based on straight line noise attenuation, noise levels from pile-driving would attenuate to approximately 78–83 dBA or less at the nearest residence, approximately 73–78 dBA or less at the Wheeler Chapel Church, approximately 56–61 dBA or less at Pond Spring, approximately 55–60 dBA or less at Roy Coffee ballpark, approximately 54–59 dBA or less at Pleasant Grove Missionary Baptist Church, and approximately 53–58 dBA or less at Wheeler Grove Baptist Church. The noise levels at the nearest residence and Wheeler Chapel Church are above both the U.S. Department of Housing and Urban Development and USEPA guidelines of 65 and 55 dBA, respectively while the noise levels at Pond Spring, Roy Coffee ballpark, Pleasant Grove Baptist Church, and Wheeler Grove Baptist Church are only above the USEPA guideline of 55 dBA. Based on straight line noise attenuation, the distance required for pile-driving to attenuate to 55 dBA or less is 5,000 feet. Therefore, pile-driving within 5,000 feet of residences, Wheeler Chapel Church, Pleasant Grove Missionary Baptist Church, Wheeler Grove Baptist Church, Pond Spring, and Roy Coffee ballpark would be scheduled during daylight hours Monday through Friday and occasionally on Saturdays when the schedule requires and outside of church services to minimize impacts to the residences, churches, Pond Spring, and Roy Coffee ballpark. Construction workers would wear appropriate hearing protection in accordance with OSHA regulations.

Following completion of construction activities, the ambient sound environment would return to existing levels or below existing levels by eliminating seasonal use of some agricultural equipment. The moving parts of the PV arrays would be electric-powered and produce little noise. The inverters would produce noise levels of approximately 62 dBA at 50 feet, and the Hillsboro III Solar substation and Bride's Hill switching station would each emit approximately 50 dBA at 300 feet. As no noise receptors are within 50 feet of the inverters or 300 feet of the Hillsboro III Solar substation and Bride's Hill switching station, noise impacts from these Project components are anticipated to be minimal to negligible. Thus, noise impacts from the operation of the Project are not anticipated. The periodic mowing of the Project Site to manage the height of vegetation surrounding the solar panels would produce noise levels comparable to those resulting from current row crop operations.

Overall, implementation of the Proposed Action would result in moderate, temporary adverse impacts to the ambient noise environment in the area surrounding the Project Site during construction, and negligible to minimal impacts during operation and maintenance of the solar facility.

3.8.2.2.2 TL Upgrade Areas

Noise-sensitive receptors near the TL Upgrade Areas would temporarily experience heightened noise during daylight hours primarily during pole drilling for the installation of four TL pole structures and the installation of OPGW by helicopter. Pole drilling activities and the installation of OPGW by helicopter would result in temporary, moderate adverse noise effects.

3.8.2.3 Cumulative Impacts

RFFAs are expected to result in noise impacts in the area surrounding the Project Site. The development of the adjacent North Alabama Utility-Scale Solar Facility could contribute to cumulative impacts to noise receptors, depending on the timing of that project. However, impacts would be short-term, and coordination could occur to minimize impacts to noise receptors. Most of the other RFFAs are located at least three miles from the Proposed Action; therefore, activities associated with the Proposed Action in combination with these RFFAs are not anticipated to contribute to cumulative impacts to noise receptors.

3.9 Air Quality and Greenhouse Gases

3.9.1 Affected Environment

Ambient air quality is determined by the type and concentration of pollutants emitted into the atmosphere, the size and topography of the airshed in question, and the prevailing meteorological conditions in that airshed. Through the passage of the Clean Air Act of 1970 and subsequent amendments, the U.S. Congress mandated the protection and enhancement of air quality for the nation. USEPA established the National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants to protect the public health and welfare: sulfur dioxide, ozone, nitrogen dioxide (NO_2), particulate matter whose particles are less than or equal to 2.5 micrometers ($PM_{2.5}$), particulate matter whose particles are less than or equal to 10 micrometers, carbon monoxide (CO), and lead (USEPA 2023a).

The primary NAAQS were promulgated to protect public health, and the secondary NAAQS were promulgated to protect public welfare (e.g., visibility, crops, forests, soils, and materials) from any known or anticipated adverse effects of air pollutants. Areas in compliance with the NAAQS are designated attainment areas and areas in violation of the NAAQS are designated as nonattainment areas (USEPA 2023b). New sources potentially in or near these nonattainment areas may be subject to more stringent air permitting requirements. Nonattainment areas are usually listed by county. Areas that cannot be classified based on available information for a particular pollutant are designated as unclassifiable and are treated as attainment areas unless proven otherwise. Areas that were formerly designated as nonattainment for a pollutant and later come into compliance are categorized under the term “maintenance” for that pollutant for the next 20 years, assuming they continue to meet the NAAQS for that pollutant. If an area remains in attainment for a 20-year maintenance period, the status is reassigned to normal attainment.

3.9.1.1 Regional Air Quality

3.9.1.1.1 Project Site

The Project Site is within a rural agricultural area of Lawrence County, between the towns of Courtland and Hillsboro. Lawrence County has no active air quality monitoring sites listed in USEPA’s national database for NAAQS-regulated pollutants and is in attainment for all NAAQS as are the adjacent counties (USEPA 2023c). The closest active air quality monitoring site monitors ozone and $PM_{2.5}$ levels and is in the city of Decatur in Morgan County, approximately 16 miles southeast of the Project Site (USEPA 2024a).

3.9.1.1.2 TL Upgrade Areas
All TL upgrades would occur within Lawrence County. The regional air quality associated with the TL Upgrade Areas is generally the same as described for the Project Site in Section 3.9.1.1.1.

3.9.1.2 Regional Climate

3.9.1.2.1 Project Site
Climate conditions, and therefore daily weather conditions, determine the potential for the atmosphere to disperse emissions of air pollutants. Based on climate data from the Courtland observation station, approximately four miles west of the Project Site, the coldest month is January, with average maximum and minimum temperatures of approximately 51 degrees Fahrenheit (°F) and 31°F, respectively. The warmest month is July, with average maximum and minimum temperatures of approximately 89°F and 70°F, respectively. Precipitation is highest in March, and averages approximately 56 inches per year (NOAA 2021). On average, approximately 53 tornados occur in Alabama each year (NOAA 2023).

3.9.1.2.2 TL Upgrade Areas
The regional climate associated with the TL Upgrade Areas is generally the same as described for the Project Site in Section 3.9.1.2.1.

3.9.1.3 Greenhouse Gas Emissions

3.9.1.3.1 Project Site
Greenhouse gases (GHGs) are specific gases that trap heat in the atmosphere and include carbon dioxide (CO_2), methane, nitrous oxide, and fluorinated gases (USEPA 2023d). GHG emissions include natural and man-made compounds that disperse throughout the earth's atmosphere. GHGs act as insulation and contribute to the maintenance of global temperatures. As the levels of GHG emissions in the atmosphere increase, the result is an increase in temperature on earth, commonly known as global warming. This can result in altered precipitation patterns, increased intensity of storms, sea level rise, and other changes.

Apart from water vapor, the primary GHG emitted by human activities in the U.S. is CO_2, representing approximately 79 percent of total GHG emissions in the U.S. (USEPA 2023d). The largest source of CO_2 and of overall GHG emissions is fossil fuel combustion, accounting for 92 percent of CO_2 emissions (USEPA 2023e). GHG emissions from the TVA power system are described in the IRP (TVA 2019).

3.9.1.3.2 TL Upgrade Areas
GHG emissions associated with the TL Upgrade Areas are generally the same as described for the Project Site in Section 3.9.1.3.1.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative
Under the No Action Alternative, the proposed solar facility would not be constructed. Therefore, no Project-related impacts on climate or air quality would result. Existing land use is expected to remain primarily agricultural land for the foreseeable future, and the existing habitat would be expected to remain unchanged, with little effect on climate and air quality. The main source of emissions in the area surrounding the Project Site would continue to be from sources such as automobiles and agricultural equipment.

3.9.2.2 Proposed Action Alternative

Under the Proposed Action, minor direct impacts to air quality would result from construction activities that generate local emissions of PM, nitrogen oxides (NO_x), CO, volatile organic compounds, and SO_2 and minimal impacts would occur during operations. Minor, temporary impacts to GHG emissions are expected during construction, which should eventually be offset by Project operation over the long term and would therefore be negligible overall. The Proposed Action would have longer term, minor beneficial impacts to air quality by increasing the capacity of non-emitting generating facilities providing power to the TVA system and reducing the need for power that would otherwise likely be generated in part by fossil fuels.

3.9.2.2.1 Regional Air Quality

3.9.2.2.1.1 Project Site

Most potential air quality impacts associated with the Proposed Action would occur during construction. Construction activities would create emissions from construction equipment and vehicles, contracted employees' personal vehicles, and fugitive dust suspension from clearing, grading, and other activities. Tree debris from clearing would be removed by either burning or chipping. Burning debris would generate temporary localized air quality impacts due to smoke particles and gases. Any such burning would be done in accordance with local ordinances or burn permits and is not expected to have any health consequences for this sparsely populated rural area.

Combustion of gasoline and diesel fuels by internal combustion engines (haul trucks and off-road vehicles) would generate local emissions of PM, NO_x, CO, volatile organic compounds, and SO_2. The total amount of these emissions would be small and, overall, would result in negligible air quality impacts.

Fugitive dust emissions, a contributor to $PM_{2.5}$ (Chen et al. 2019), from vehicular traffic over paved and unpaved roads would be composed mainly of particles that would be deposited near the roadways, along the routes taken to reach the Project Site. As necessary, fugitive dust emissions from construction areas and paved and unpaved roads would be mitigated using BMPs including wet suppression. Wet suppression can reduce fugitive dust emissions from roadways and unpaved areas by as much as 95 percent (USEPA 1998). Therefore, direct impacts to air quality associated with construction activities would likely be minor.

3.9.2.2.1.2 TL Upgrade Areas

Under the Proposed Action, TVA would install approximately five and seven miles of OPGW on L5832 and L5669, respectively. Combustion of gasoline and diesel fuels by internal combustion engines (construction equipment and vehicles) would generate local emissions of PM, NO_x, CO, volatile organic compounds, and SO_2. The total amount of these emissions would be small and, overall, would result in negligible air quality impacts. Construction equipment and vehicles would generate temporary and minor amounts of fugitive dust when accessing the TL structures via existing paved and unpaved roads. In addition, temporary and minor helicopter emissions would occur to install the OPGW. As necessary, fugitive dust emissions from construction areas and paved and unpaved roads would be mitigated using BMPs including wet suppression. Therefore, direct impacts to air quality associated with construction activities would likely be minor.

3.9.2.2.2 Regional Climate

3.9.2.2.2.1 Project Site

No noticeable direct or indirect impacts to the local or regional climate would be associated with the construction and operation of the proposed Project. Local or regional climate effects can occur, for example, with major changes in land use that affect the hydrological cycle, or that create large impervious surfaces, thus changing the radiative heat balance over a large area. The Project would change land surface characteristics but would have little effect on soil permeability and hydrologic characteristics of the developed area. Vegetation would grow under and around the solar panels to maintain a landscape with significant evapotranspiration and infiltration of precipitation, as opposed to creating runoff of precipitation/stormflow, as commonly occurs with urban development. The changes that occur in urban development from increased impervious surfaces and lack of evapotranspiration can create a “heat island” effect. The development of the solar facility is not anticipated to create this “heat island” effect; therefore, any changes to average temperatures and annual precipitation runoff amounts of the developed area would likely be minimal to negligible.

3.9.2.2.2.2 TL Upgrade Areas

Regional climate impacts associated with the TL Upgrade Areas are generally the same as described for the Project Site in Section 3.9.2.2.2.1.

3.9.2.2.3 Greenhouse Gas Emissions

3.9.2.2.3.1 Project Site

The use of construction equipment would cause a minor increase in GHG emissions during construction activities. Combustion of gasoline and diesel fuels by internal combustion engines (trucks and off-road vehicles) at the Project Site would generate emissions of CO_2 and very small amounts of other GHG emissions such as methane and nitrous oxide. Additional GHG emissions would result from transporting materials and workers to the Project location, and elsewhere in the U.S. or globally from production and transportation of the facility components. The production of facility components would likely represent the largest portion of the Project-related GHG emissions. The total GHG emissions due to construction should eventually be offset by Project operation over the long term, assuming the electricity generated by the Project would reduce the need for power that would otherwise be generated in part by fossil fuels.

Removal of trees and other tall vegetation during construction of the Project would result in a minor loss of potential carbon sequestration, especially given that most of the Project Site is currently fields and open land. Trees and other tall vegetation remove CO_2 from the air and sequester CO_2 as biomass. The loss of this carbon sink would constitute a minor adverse direct and indirect impact as sequestration would have continued for the life of the vegetation and long into the future, assuming that other changes at the Project Site did not result in any deforestation. The loss of the carbon sink from the small area of tree removal would be at least partially offset by the increased sequestration of CO_2 by the permanent grass-dominated vegetation that would be maintained on the Project Site and, to a greater extent, the eventual reforestation of the 1,348 acres of cropland that would not be developed.

The operation of the Project is not anticipated to have any negative impacts to air quality or GHG emissions. No emissions would be produced by the operation of the solar facility. Minor emissions would occur during maintenance activities, including facility inspections and periodic mowing. Conversely, the nearly emissions-free power generated by the solar facility would reduce the need for power that would otherwise likely be generated in part by fossil fuels. The reduction in GHG emissions resulting from the operation of the solar facility would have little noticeable effect on regional or larger scales. The Project would, however, be a component of the larger ongoing system-wide reduction in GHG emissions from the TVA power system through reducing the need for some fossil-fuel-based electricity generation. The adverse impacts of GHG emissions are described in the U.S. Global Change Research Program's Fifth National Climate Assessment (USGCRP 2023), and the beneficial impacts of TVA's reduction in GHG emissions are described in the TVA IRP (TVA 2019).

3.9.2.2.3.2 TL Upgrade Areas

The use of construction equipment would cause a minor increase in GHG emissions during construction activities. Combustion of gasoline and diesel fuels by internal combustion engines (construction equipment and vehicles) and aviation fuel by a turbine engine (helicopter) at the TL Upgrade Areas would generate emissions of CO_2 and small amounts of other GHG emissions such as methane and nitrous oxide.

There are typically no operational emissions from the TLs and associated electrical equipment. If any electrical equipment contains the GHG sulfur hexafluoride gas (e.g., electrical switchgear, circuit breakers), there is the potential for minor leaks, mostly associated with maintenance or long-term equipment degradation. Through routine preventative maintenance programs, leaking equipment would be identified and remedied or replaced. In addition, due to newer equipment, more efficient operation and maintenance techniques, and leak detection, these features would minimize sulfur hexafluoride emissions.

3.9.2.3 Cumulative Impacts

Except for the development of the adjacent North Alabama Utility-Scale Solar Facility, past, present, and RFFAs would likely contribute a significantly higher percentage of air pollutant emissions, including GHGs, to the region than the Proposed Action. This includes both temporary construction and long-term operational emissions. Additionally, the operational emissions from these other actions would likely have at least minor negative impacts on air quality in the region. However, the Proposed Action in combination with the development of the adjacent North Alabama Utility-Scale Solar Facility, would provide at least a minor beneficial impact on air quality in the region due to producing renewable energy that reduces the need for certain fossil-fueled power generation. In addition, all other actions would likely comply with applicable air quality requirements and permitting and would implement emissions reduction actions as part of construction activities (e.g., wet suppression to reduce fugitive dust).

3.10 Cultural Resources

3.10.1 Affected Environment

Cultural resources are properties and places that illustrate aspects of Precontact or historic times or have long-standing cultural associations with established communities and/or social groups. Cultural resources may include archaeological sites, unmodified landscapes and discrete natural features, modified landscapes, human-made objects, structures such as bridges or buildings, and groups of any of these resources, sometimes referred to as districts.

Section 106 of the NHPA, as amended (54 U.S.C. §§ 300101 *et seq.*), addresses the effects of federal and/or federally funded projects on tangible cultural resources—that is, physically concrete properties—of historic value. The NHPA provides a national program to support both public and private efforts to identify, evaluate, and protect the nation's important cultural resources. Once identified, these resources are evaluated for inclusion in the NRHP maintained by the NPS. Tangible cultural resources may qualify for inclusion in the NRHP if they are 50 years of age or older (unless in exceptional cases) and if found to embody one or more of four different types of values, or criteria, in accordance with 36 CFR § 60.4:

- Criterion A: association with events that have made a significant contribution to the broad patterns of our history. Such events may include a specific occurrence or pattern of occurrences, cultural traditions, or historic trends important at a local, regional, or national level. To be considered in association with a cultural resource, events must be important within the particular context being assessed.
- Criterion B: association with the lives of persons significant in our past. People considered may be important locally, regionally, or nationally, and the cultural resources considered are limited to properties illustrating a person's achievements rather than commemorating them.
- Criterion C: embodiment of the distinctive characteristics of a type, period, or method of construction; representative of the work of a master; possessing high artistic values; or representative of a significant and distinguishable entity whose components may lack individual distinction. Cultural resources considered generally include architectural resources such as buildings, objects, districts, and designed landscapes.
- Criterion D: cultural resources that have yielded, or may be likely to yield, information important in prehistory or history. Considered cultural resources typically include archaeological sites but may also include buildings, structures, and objects if they are the principal source of important information not contained elsewhere.

Cultural resources that are listed or considered eligible for listing in the NRHP are called "historic properties." Federal agencies are required by the NHPA to consider the possible effects of their undertakings on historic properties and take measures to avoid, minimize, or mitigate any adverse effects. NEPA requires federal agencies to consider how their undertakings may affect the quality of the human environment, including both cultural resources and those defined as historic properties, so that the nation may "preserve important historic, cultural, and natural aspects of our national heritage." "Undertaking" includes any project, activity, or program that has the potential to affect a historic property and that is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency.

Considering an undertaking's effects on historic properties is accomplished through a four-step review process outlined in Section 106 of the NHPA (36 CFR § 800). These steps are initiation, identification, assessment of adverse effects, and resolution of any adverse effects. A project may have effects on a historic property that are not adverse. However, if the agency determines that the undertaking's effect on a historic property would diminish any of the qualities that make the property eligible for the NRHP (based on the criteria for evaluation at 36 CFR § 60.4), the effect is said to be adverse. Examples of adverse effects would be ground disturbing activity in an archaeological site or erecting tall buildings or structures within the viewshed of a historic building in such a way as to diminish the historic building's integrity of feeling or setting and the building's ability to convey historic and/or architectural significance. Adverse effects must be resolved. Resolution may consist of avoidance (such as redesigning a project to avoid impacts or choosing a project alternative that does not result in adverse effects), minimization (such as redesigning a project to lessen the effects), or mitigation. Adverse effects to archaeological sites are typically mitigated by excavation to recover the important scientific information contained within the site. Mitigation of adverse effects to historic buildings and structures sometimes involves thorough documentation of the resource by compiling historic records, studies, and photographs.

Agencies are required to consult with the appropriate State Historic Preservation Office, federally recognized tribes that have an interest in the undertaking, and any other party with a vested interest in the undertaking. Through various regulations and guidelines, federal agencies are encouraged to coordinate Section 106 and NEPA review to improve efficiency and allow for more informed decisions. Under NEPA, impacts to cultural resources that are part of the affected human environment but not necessarily eligible for the NRHP must also be considered. Generally, these considerations as well as those of NRHP-eligible traditional cultural resources (also called traditional cultural properties; see Parker and King (1998)) are accomplished through consultation with parties having a vested interest in the undertaking, as described above.

3.10.1.1 Cultural Context

Humans have inhabited northern Alabama continuously for more than 13,000 years. This period began with small, highly mobile groups of people using large spear points and knives, who at least occasionally hunted large now-extinct mammals. Thousands of years of cultural change and adaptation were marked by the development of large stone tools for processing nuts and shellfish during the Archaic Period (10,000–3,000 years ago), followed by the adoption of pottery and the first beginnings of plant cultivation in the Woodland Period (3,000–1,100 years ago), and the rise of large towns during the Mississippian period beginning circa about AD 900. The historic contact period in northern Alabama was largely populated by members of the Cherokee, Creek, Chickasaw, and Choctaw nations. Generally, large pre-contact habitation sites are found on levees or terraces along rivers and tributaries, while specialized campsites tend to be found on older alluvial terraces and in the uplands where resources were gathered. Levees and river terraces in the Tennessee River that were once occupied by various groups have been inundated by Guntersville, Wheeler, and Wilson Reservoirs.

Located in northwestern Alabama along the Tennessee River, Lawrence County borders Colbert, Lauderdale, and Limestone counties to the north, Franklin County to the west, Winston County to the south, and Morgan County to the east. Lawrence County was created by an act of the Alabama Territorial Legislature on February 6, 1818, nearly one year before Alabama became a state. The county was created from former Chickasaw lands ceded to the U.S. in the Treaty of Fort Jackson in 1814, the Turkey Town Treaty of 1816 and as well as Cherokee land acquired in the Treaty of Chickasaw Council House in 1816. The forced removal of over 2,000 indigenous people began in 1836 on overland transportation routes through Lawrence County, as part of the Cherokee Trail of Tears. Nearby, the Tuscumbia, Courtland and Decatur Railroad was used by the Smith (March 9–10, 1837), Deas (July 11, 1838), and Whiteley (July 21, 1838) detachments to transport the Cherokee from Decatur to Tuscumbia Landing.

The earliest Euro-American settlers to the area came primarily from Georgia, Tennessee, and the Carolinas, with others later coming from Kentucky and Virginia (King et al. 2009). Most settlers in the interior of the county consisted of small landholders and relied on agricultural activities for subsistence. Large scale cotton production, encouraged by the rich soil along the Tennessee River, resulted in the rise of farms and plantations. The county's burgeoning population included enslaved Africans and African Americans. At one time, plantation properties were numerous in the corridor between Decatur and Tuscumbia, Alabama, including the Pond Spring Plantation that is just south of the Project Site. Pond Spring was originally owned by John P. Hickman and later purchased by Benjamin Sherrod and then General Joseph (Joe) Wheeler. Skirmishes throughout the Civil War in northern Alabama mainly related to control over the supply line provided by the Memphis and Charleston railroad, including near Pond Spring. The facilities at the Pond Spring Plantation served as a camp for both the Union and Confederate armies, though primary sources more often allude to the plantation being used as a Confederate camping location (Meeks and Anderson 2012).

Born in 1836 in Augusta, Georgia, Joe Wheeler earned the rank of colonel in the Confederate army during the Civil War. He became the owner of Pond Spring when he married Daniella Jones Sherrod, whose father made a wedding gift of the 2,000-acre plantation. In addition to operating the plantation, Wheeler ran the Pond Spring Store, located in the front yard of Pond Spring Plantation. A community with a railroad depot developed around the Pond Spring Store, and both the community and depot were subsequently known as Wheeler Station or Wheeler. The railroad depot at Wheeler Station served as a regular stop and departure point for passengers and cargo. General stores like the Pond Spring Store sprang up across the South in the post-Reconstruction era and became a symbol of a newly emerging Southern economic system (Clark 1944). Over the decades, as large plantations replaced clustered slave dwellings with more widespread tenant housing, farmers found themselves increasingly in need of small-town merchants and stores (Bull 1952). In rural areas, general stores played a central role in the community, providing an outlet for the acquisition of goods and services as well as a place for social gathering (Bull 1952; Clark 1944).

Because of Courtland's location in the northern portion of the county, where most plantations once stood, many freed African Americans worked as tenant farmers in the surrounding area. In the community of Wheeler Station, as many as 200 tenant farms stood during the 1930s, operated by both white and African American tenants (Port et al. 2002). Beginning in the 1930s, TVA constructed a series of locks and dams on the Tennessee River, making electricity widely available and inexpensive. This caused a shift in Lawrence County's economy from agriculture and forestry to industry and manufacturing.

3.10.1.2 Project Site and TL Upgrade Areas

Under contract with HDR, Tennessee Valley Archaeological Research (TVAR) conducted Phase I archaeological and architectural surveys for the Project. TVA determined the archaeological area of potential effects (APE) to be the entirety of the Project Site and TL Upgrade Areas. TVA also determined the architectural APE to be the entirety of the Project Site and TL Upgrades, the footprints of the five TL structures slated for upgrades (all located on L5832), and portions of a 0.5-mile radius surrounding the Project Site and the five TL structures slated for upgrades that are visually connected via viewsheds to and from each of their footprints. Areas within the 0.5-mile radius that were determined not to have a view of each footprint due to terrain, vegetation, and/or intervening buildings and structures were excluded from the architectural APE.

3.10.1.2.1 Archaeological Survey Results

TVAR conducted the archaeological investigation of the archaeological APE in two phases: 1) survey of the planned geotechnical exploration locations December 4–15, 2023; and 2) survey of the Project Site and segments of the existing ROWs associated with L5832 and L5669 on February 19 and July 18, 2024. As a result of the survey, TVAR evaluated 111 archaeological sites, 212 non-site cultural resources, two NRHP-listed properties (Bride's Hill and Wheeler Hydroelectric Project [WHP]), one NRHP-eligible property (Wheeler Station Rural Historic District [WSRHD]), and three cemeteries within the archaeological APE.

TVAR evaluated 111 archaeological sites within the archaeological APE, including 19 previously recorded sites and 92 newly recorded sites (Table 3-26). These 111 resources, listed in Table 3-26, included 20 sites associated with precontact occupations, 51 sites associated with both precontact and historic occupations, and 39 sites associated with historic occupations. TVAR recommended avoidance of 33 sites of undetermined eligibility for NRHP listing.

Two sites (1LA992 and 1LA997) were determined ineligible for NRHP listing as individual resources and non-contributing elements to the NRHP-eligible WSRHD during consultation on the adjacent North Alabama Utility-Scale Solar Facility in 2021. TVAR determined that an additional 69 sites offer little research potential beyond the findings of the Phase I survey, and all are recommended not eligible for inclusion to the NRHP. No additional investigations of these 71 sites in connection with the undertaking are recommended.

TVAR determined that the mapped location of site 1LA363 was mis-plotted during its initial recordation (site not located within the archaeological APE), and TVAR provides no formal NRHP eligibility assessment for this resource. TVAR did not fully delineate six sites (1LA244, 1LA342, 1LA1220–1LA1222, and 1LA1273) due to constraints of the archaeological survey area. Two sites (1LA244 and 1LA342) are mapped as extending outside the archaeological APE and the remaining four sites (1LA1220–1LA1222 and 1LA1273) may extend outside the archaeological APE. Therefore, TVAR determined that the investigated portions of these six sites would not contribute to their respective resources' NRHP eligibility under Criterion D and no additional investigations of these six sites in connection with the undertaking are recommended.

Table 3-26. Archaeological sites recorded as a result of the Phase I investigation

Site Number	Relation to Archaeological APE	Cultural Affiliation		NRHP Recommendation	Management Consideration
		Precontact	Historic		
1LA244	L5832[1]	–	X	Undetermined[5]	None
1LA342	Project Site[1]	X	X	Undetermined[5]	None
1LA343	Project Site[1]	X	X	Undetermined[5]	Avoidance[9]
1LA344	Project Site[2]	X	X	Ineligible	None
1LA345	Project Site	X	–	Ineligible	None
1LA346	Project Site[2]	–	X	Ineligible	None
1LA363[3]	L5669	N/A	N/A	Not Assessed[6]	N/A
1LA716	Project Site	X	–	Ineligible	None
1LA717	Project Site	X	–	Ineligible	None
1LA726	Project Site	X	–	Ineligible	None
1LA811	Project Site	X	–	Ineligible	None
1LA812	Project Site	X	X	Ineligible	None
1LA813	Project Site	X	–	Ineligible	None
1LA822	Project Site	X	–	Ineligible	None
1LA829	Project Site	X	X	Ineligible[7]	None
1LA987	Project Site[1]	X	X	Undetermined[8]	Avoidance[9]
1LA992	Project Site[1]	X	–	Ineligible[7]	None
1LA997	Project Site[1]	X	–	Ineligible[7]	None
1LA998	Project Site[1]	X	X	Undetermined[8]	Avoidance[9]
1LA1113	Project Site	X	X	Ineligible	None
1LA1114	Project Site	–	X	Ineligible	None
1LA1115	Project Site	X	X	Undetermined	Avoidance[9]
1LA1220	L5669[4]	X	X	Undetermined[5]	None
1LA1221	L5669[4]	X	X	Undetermined[5]	None
1LA1222	L5669[4]	X	X	Undetermined[5]	None
1LA1223	L5669	X	–	Ineligible	None
1LA1224	L5669	X	X	Ineligible	None
1LA1225	L5669	X	X	Ineligible	None
1LA1226	Project Site[4]	–	X	Undetermined	Avoidance[9]
1LA1227	Project Site	–	X	Ineligible	None
1LA1228	Project Site	–	X	Ineligible	None
1LA1229	Project Site	–	X	Ineligible	None
1LA1230	Project Site	–	X	Ineligible	None
1LA1231	Project Site	–	X	Undetermined	Avoidance[9]
1LA1232	Project Site	–	X	Ineligible	None
1LA1233	Project Site	X	X	Undetermined	Avoidance[9]
1LA1234	Project Site	X	X	Undetermined	Avoidance[9]
1LA1235	Project Site	–	X	Ineligible	None
1LA1236	Project Site	X	X	Ineligible	None
1LA1237	Project Site	X	X	Ineligible	None
1LA1238	Project Site	–	X	Ineligible	None

Site Number	Relation to Archaeological APE	Cultural Affiliation		NRHP Recommendation	Management Consideration
		Precontact	Historic		
1LA1239	Project Site	–	X	Ineligible	None
1LA1240	Project Site	X	–	Ineligible	None
1LA1241	Project Site	X	X	Ineligible	None
1LA1242	Project Site[2]	X	X	Undetermined	Avoidance[9]
1LA1243	Project Site[2]	–	X	Undetermined	Avoidance[9]
1LA1244	Project Site	–	X	Ineligible	None
1LA1245	Project Site	–	X	Undetermined	Avoidance[9]
1LA1246	Project Site	X	X	Undetermined	Avoidance[9]
1LA1247	Project Site	X	X	Ineligible	None
1LA1248	Project Site[2]	X	X	Undetermined	Avoidance[9]
1LA1249	Project Site	X	X	Ineligible	None
1LA1250	Project Site	X	–	Ineligible	None
1LA1251	Project Site	X	X	Ineligible	None
1LA1252	Project Site	X	X	Undetermined	Avoidance[9]
1LA1253	Project Site	–	X	Ineligible	None
1LA1254	Project Site	X	X	Undetermined	Avoidance[9]
1LA1255	Project Site	–	X	Undetermined	Avoidance[9]
1LA1256	Project Site	X	X	Ineligible	None
1LA1257	Project Site	–	X	Ineligible	None
1LA1258	Project Site	X	–	Ineligible	None
1LA1259	Project Site	X	–	Ineligible	None
1LA1260	Project Site	X	X	Ineligible	None
1LA1261	Project Site	X	X	Ineligible	None
1LA1262	Project Site	X	X	Ineligible	None
1LA1263	Project Site	–	X	Ineligible	None
1LA1264	Project Site	–	X	Ineligible	None
1LA1265	Project Site	–	X	Undetermined	Avoidance[9]
1LA1266	Project Site	–	X	Ineligible	None
1LA1267	Project Site	X	X	Ineligible	None
1LA1268	Project Site	X	X	Undetermined	Avoidance[9]
1LA1269	Project Site	–	X	Ineligible	None
1LA1270	Project Site	X	X	Undetermined	Avoidance[9]
1LA1271	Project Site	–	X	Ineligible	None
1LA1272	Project Site	–	X	Undetermined	Avoidance[9]
1LA1273	Project Site[4]	X	X	Undetermined[5]	None
1LA1274	Project Site[2]	–	X	Ineligible[7]	None
1LA1275	Project Site	–	X	Ineligible[7]	None
1LA1276	Project Site	–	X	Ineligible[7]	None
1LA1277	Project Site	–	X	Ineligible[7]	None
1LA1278	Project Site[2]	–	X	Undetermined[8]	Avoidance[9]
1LA1279	Project Site	–	X	Undetermined	Avoidance[9]
1LA1280	Project Site	X	X	Ineligible[7]	None
1LA1281	Project Site	–	X	Ineligible[7]	None

Site Number	Relation to Archaeological APE	Cultural Affiliation		NRHP Recommendation	Management Consideration
		Precontact	Historic		
1LA1282	Project Site	–	X	Ineligible[7]	None
1LA1283	Project Site	–	X	Ineligible	None
1LA1284	Project Site	X	–	Ineligible	None
1LA1285	Project Site	X	–	Ineligible	None
1LA1286	Project Site	X	–	Ineligible	None
1LA1287	Project Site	X	X	Undetermined	Avoidance[9]
1LA1288	Project Site	X	X	Ineligible	None
1LA1289	Project Site	X	–	Ineligible	None
1LA1290	Project Site	X	–	Undetermined	Avoidance[9]
1LA1291	Project Site[2]	X	X	Ineligible	None
1LA1292	Project Site	X	X	Ineligible	None
1LA1293	Project Site[4]	X	X	Undetermined	Avoidance[9]
1LA1294	Project Site	X	X	Ineligible	None
1LA1295	Project Site	–	X	Ineligible	None
1LA1296	Project Site	X	X	Undetermined	Avoidance[9]
1LA1297	Project Site	X	X	Ineligible	None
1LA1298	Project Site[2]	–	X	Ineligible	None
1LA1299	Project Site	–	X	Ineligible	None
1LA1300	Project Site	X	–	Ineligible	None
1LA1301	Project Site	X	X	Undetermined	Avoidance[9]
1LA1302	Project Site	X	X	Undetermined	Avoidance[9]
1LA1303	Project Site	X	X	Undetermined	Avoidance[9]
1LA1304	Project Site	–	X	Ineligible	None
1LA1305	Project Site	X	X	Undetermined	Avoidance[9]
1LA1306	Project Site	X	X	Undetermined	Avoidance[9]
1LA1307	Project Site	X	X	Undetermined	Avoidance[9]
1LA1308	Project Site	X	X	Undetermined	Avoidance[9]

[1] Based on reviews of the Alabama State Site File and the Alabama Cultural Resources Online Database, the site is mapped as extending outside the APE. Due to constraints of the archaeological survey area, that portion of the site located outside the APE was not investigated by TVAR.
[2] Site has at least one boundary defined by the disturbed ROW of a highway or county road. These include the following: 1LA1242, 1LA1243, 1LA1248, 1LA1298 (US 72A/SR 20), 1LA344, 1LA1274, 1LA1278, 1LA1291 (Browns Ferry Road), and 1LA346 (Browns Ferry Road and CR 420).
[3] It is TVAR's opinion that the site 1LA363 is mis-plotted in both the Alabama State Site File and the Alabama Cultural Resources Online Database. This resource is not located within the APE.
[4] Site was not fully delineated by TVAR due to constraints of the archaeological survey area. The site may extend outside the APE.
[5] The investigated portion of the site within the APE would not contribute to the resource's overall NRHP eligibility (the portion[s] of the site that extends or may extend outside the APE remains unevaluated by TVAR).
[6] TVAR provides no NRHP recommendation for this site because there was no formal assessment.
[7] TVAR recommends the site as a non-contributing resource to the WSRHD.
[8] TVAR's opinion is that the site holds the potential to be a contributing resource to the WSRHD.
[9] No ground disturbance allowed within the established avoidance buffer.

3.10.1.2.2 Architectural Survey Results

Prior to conducting the architectural field investigation, TVAR performed background research to identify previous historic architectural inventory surveys and inventoried historic resources, including resources currently listed on the Alabama Register of Landmarks and History (ARLH), the NRHP, and/or any awaiting such listing, located within the architectural APE. Research identified 47 previously inventoried historic resources within the architectural APE (Table 3-27, Figure 3-38). The Pond Spring/Joseph Wheeler Plantation and Bride's Hill/Sunnybrook are currently NRHP-listed resources. Based on their most recent recordation and evaluation, 12 resources (including the WSRHD) were recommended NRHP-eligible, and 14 resources were recommended NRHP-ineligible. The remaining 19 resources have been destroyed since their most recent recordation and evaluation.

Research related to L5832 and L5669 found no record of a prior investigation of L5832; however, a recent report detailing the results of a Phase I cultural resources survey conducted by New South Associates, Inc. (NSA) in association with TVA's proposed relocation of the Wheeler Switchyard station in Lawrence County, Alabama (Tran et al. 2023), included an evaluation of a segment of L5669 assessed by TVAR. In their report, NSA recommended segments of six individual TLs constructed in the 1930s located within the boundary of the NRHP-listed Wheeler Hydroelectric Project (WHP), including a portion of L5669, as eligible for listing in the NRHP under Criterion A and as contributing resources to the WHP property. Listed under Criterion A and C, the WHP's significance relates to architecture, conservation, engineering, industry, military, recreation, social history, and transportation (Martens et al. 2015; Martens and Thomason 2016). At the state and local levels, the WHP was found to be significant in the areas of recreation, social history, transportation, and military under NRHP Criteria A (Martens and Thomason 2016).

Table 3-27. Previously inventoried historic resources within the architectural APE

Inventory Number			Property Name/Description	Date	NRHP Status[5]
UA-OAS 1999 Survey[1]	TVAR 2020 Survey[2]	TVAR 2021 Assessment[3]			
079-50	–	–	Craftsman Bungalow	ca. 1925	Razed[7]
079-51	–	–	Generic Vernacular Cottage	ca. 1925	Ineligible
079-58	079-58	079-58	Pond Spring/Joseph Wheeler Plantation	1818–1955	Listed
079-60	–	079-60	Byrd Log House	ca. 1830	Ineligible[6]
079-61	–	–	Double Pen House	ca. 1910	Razed[7]
079-62	–	–	Dogtrot House	ca. 1850	Razed[7]
079-63	–	–	Massed Plan Cottage	ca. 1947	Razed[7]
079-76	–	–	Craftsman Bungalow	ca. 1950	Ineligible
079-493	079-493	079-493	Wheeler Grove Baptist Church	ca. 1880–1930	**Ineligible**
079-494	–	–	Craftsman Bungalow	ca. 1955	Razed[7]
079-495	–	–	Craftsman Bungalow	ca. 1955	Razed[7]
079-496	079-496	079-496	Double Pen House	ca. 1920	Razed[8]
079-497	079-497	079-497	Massed Plan Cottage	ca. 1945	**Ineligible**
079-498	079-498	079-498	Wheeler School	ca. 1936	**Ineligible**
079-499	–	–	Double Pen House	ca. 1915	Razed[7]
079-500	–	–	Massed Plan Cottage	ca. 1940	Razed[7]

Inventory Number			Property Name/Description	Date	NRHP Status[5]
UA-OAS 1999 Survey[1]	TVAR 2020 Survey[2]	TVAR 2021 Assessment[3]			
079-501	–	–	Saddlebag Tenant House	ca. 1915	Razed[7]
079-502	079-502	079-502	Bride's Hill/Sunnybrook	ca. 1830	Listed[6]
079-503	079-503	079-503	Coleman Terry's Store/ American Store	ca. 1938	**Eligible**
079-504	079-504	079-504	Central Passage Cottage	ca. 1936	**Ineligible**
079-505	–	079-505	Ralph M. Morris House	ca. 1946	**Ineligible**
079-506	–	–	Massed Plan Cottage	ca. 1915	Razed[7]
079-507	–	–	Massed Plan Cottage	ca. 1945	Razed[7]
079-508	–	–	Generic Tenant House	ca. 1945	Razed[7]
079-509	–	–	Craftsman Bungalow	ca. 1925	Razed[7]
079-510	–	–	Craftsman Bungalow	ca. 1925	Razed[7]
079-511	–	–	Generic Tenant House	ca. 1951–1958	Ineligible
079-534	–	–	Massed Plan Cottage	ca. 1945	Razed[7]
079-535	–	–	Craftsman Bungalow	ca. 1951–1958	Eligible
079-536	–	–	Craftsman Bungalow	ca. 1936–1951	Eligible
079-537	–	–	Terry's Grocery	ca. 1958–1975	Eligible
079-538	–	–	Craftsman Bungalow	ca. 1944	Eligible
079-539	–	–	Lovett House	ca. 1944	Eligible
079-540	–	–	Craftsman Bungalow	ca. 1936–1948	Eligible
079-541	–	–	Norton's This and That	ca. 1925	Razed[7]
079-542	–	–	Craftsman Bungalow	ca. 1951–1958	Eligible
079-543	–	–	Craftsman Bungalow	ca. 1936–1951	Eligible
079-544	–	–	Craftsman Bungalow	ca. 1945	Eligible
079-545	–	–	Craftsman Bungalow	ca. 1945	Razed[7]
079-546	–	–	Massed Plan Cottage	ca. 1945	Ineligible
–	LA00001	LA00001	Norfolk Southern Railroad[4]	1832	**Eligible**
–	LA00005	LA00005	Ranch House	ca. 1965	**Ineligible**
–	LA00006	LA00006	Ranch House	ca. 1968	**Ineligible**
–	LA00007	LA00007	Commercial Building	ca. 1965	Razed[8]
–	LA00008	LA00008	Single Pen House	ca. 1875–1914	**Ineligible**
–	LA00009	LA00009	Ranch House	ca. 1968	**Ineligible**
–	–	None	WSRHD	1818–1955	Eligible

[1] The University of Alabama, Office of Archaeological Services (UA-OAS). Reported in Ford 2000.
[2] Reported in Rael et al. 2021.
[3] Reported in Meeks and Carnell 2021.
[4] Tuscumbia, Courtland, and Decatur (1832–1851), Memphis and Charleston (1851–1894), and Southern (1894–1982).
[5] NRHP status at the time of the background research. **Emboldened** eligibility statuses were determined during consultation between TVA and AHC in 2021. Destroyed resources listed as razed based on Rael et al. 2021 and the Phase I Historic Architectural Survey.
[6] ARLH-listed property.
[7] Resource destroyed between 1999 and 2021.
[8] Resource destroyed between 2021 and 2024.

TVAR conducted the architectural field investigation February 13–21, 2024. Based on a combination of background research, viewshed analyses, and field observations, TVAR documented 59 historic resources within the architectural survey area, including 10 newly inventoried resources and 49 previously inventoried resources (Table 3-28). Of these 59 historic resources, TVAR determined that 32 resources were extant and within view of the Project Site (within the architectural APE), eight resources were extant but visually disconnected from the Project Site (outside the architectural APE), and 19 resources had been destroyed since their initial recordation. Of the 32 extant historic resources within view of the Project Site, eight resources (La00003–La00005 and La00008–La00012) were determined NRHP-ineligible in 2021 during consultation between TVA and the AHC. An additional 20 resources (La00013–La00032) are recommended ineligible for NRHP listing due to their lack of architectural distinction, loss of integrity resulting from modern alterations or damage, and/or lack of historical significance. TVAR determined that one NRHP-listed property (La00006 [Bride's Hill/Sunnybrook]) and three NRHP-eligible properties (La00001 [WSRHD], La00002 [Norfolk Southern Railroad], and La00007 [Coleman Terry's Store/American Store]) are located within view of the Project Site with two of these resources (La00001 and La00006) located within the footprint of the Project Site. TVAR recommends resources La00001, La00002, La00006, and La00007 to remain listed in the NRHP, or eligible for such listing, as each retains sufficient integrity to convey their respective identified significance.

Table 3-28. Historic resources documented within the architectural APE

Inventory Number			Property Name/Description	Date	Relation to Project Site Viewshed
UA-OAS 1999 Survey[1]	TVAR 2020 Survey[2]	TVAR 2024 Survey			
–	–	La00001	WSRHD[3]	1818–1955	Visible
079-58	079-58	–	Pond Spring/Joseph Wheeler Plantation[3]	1818–1955	Not Visible
079-502	079-502	La00006	Bride's Hill/Sunnybrook[3]	ca. 1830	Visible
–	LA00001	La00002	Norfolk Southern Railroad[3,4]	1832	Visible
079-534	–	–	Massed Plan Cottage	ca. 1945	Razed[5]
079-535	–	La00015	Craftsman Bungalow	ca. 1951–1958	Visible
079-536	–	La00016	Craftsman Bungalow	ca. 1936–1951	Visible
079-537	–	La00017	Terry's Grocery[7]	ca. 1958–1975	Visible
079-538	–	La00017	Craftsman Bungalow[7]	ca. 1944	Visible
079-539	–	La00018	Lovett House	ca. 1944	Visible
079-540	–	La00019	Craftsman Bungalow	ca. 1936–1948	Visible
079-541	–	–	Norton's This and That	ca. 1925	Razed[5]
079-542	–	La00020	Craftsman Bungalow	ca. 1951–1958	Visible
079-543	–	La00021	Craftsman Bungalow	ca. 1936–1951	Visible
079-544	–	La00022	Craftsman Bungalow	ca. 1945	Visible
079-545	–	–	Craftsman Bungalow	ca. 1945	Razed[5]
079-546	–	–	Massed Plan Cottage	ca. 1945	Not Visible
079-493	079-493	La00012	Wheeler Grove Baptist Church[3]	ca. 1880–1930	Visible
–	LA00007	–	Commercial Building[3]	ca. 1965	Razed[6]

Inventory Number			Property Name/Description	Date	Relation to Project Site Viewshed
UA-OAS 1999 Survey[1]	TVAR 2020 Survey[2]	TVAR 2024 Survey			
079-494	–	–	Craftsman Bungalow	ca. 1955	Razed[5]
079-495	–	–	Craftsman Bungalow	ca. 1955	Razed[5]
079-496	079-496	–	Double Pen House[3]	ca. 1920	Razed[6]
079-497	079-497	–	Massed Plan Cottage[3]	ca. 1945	Not Visible
–	LA00008	La00011	Single Pen House[3]	ca. 1875–1914	Visible
079-498	079-498	La00003	Wheeler School[3]	ca. 1936	Visible
079-60	–	La00013	Byrd Log House[3]	ca. 1830	Visible
079-61	–	–	Double Pen House	ca. 1910	Razed[5]
079-62	–	–	Dogtrot House	ca. 1850	Razed[5]
079-63	–	–	Massed Plan Cottage	ca. 1947	Razed[5]
079-76	–	–	Craftsman Bungalow	ca. 1950	Not Visible
079-499	–	–	Double Pen House	ca. 1915	Razed[5]
079-500	–	–	Massed Plan Cottage	ca. 1940	Razed[5]
079-501	–	–	Saddlebag Tenant House	ca. 1915	Razed[5]
–	LA00005	La00004	Ranch House[3]	ca. 1965	Visible
–	LA00006	La00005	Ranch House[3]	ca. 1968	Visible
079-503	079-503	La00007	Coleman Terry's Store/ American Store[3]	ca. 1938	Visible
079-504	079-504	La00008	Central Passage Cottage[3]	ca. 1936	Visible
079-505	–	La00009	Ralph M. Morris House[3]	ca. 1946	Visible
–	LA00009	La00010	Ranch House[3]	ca. 1968	Visible
079-506	–	–	Massed Plan Cottage	ca. 1915	Razed[5]
079-507	–	–	Massed Plan Cottage	ca. 1945	Razed[5]
079-508	–	–	Generic Tenant House	ca. 1945	Razed[5]
079-509	–	–	Craftsman Bungalow	ca. 1925	Razed[5]
079-510	–	–	Craftsman Bungalow	ca. 1925	Razed[5]
079-511	–	La00014	Generic Tenant House	ca. 1951–1958	Visible
079-50	–	–	Craftsman Bungalow	ca. 1925	Razed[5]
079-51	–	–	Generic Vernacular Cottage	ca. 1925	Not Visible
–	–	La00023	Ranch House	ca. 1969	Visible
–	–	La00024	Bethlehem Primitive Baptist Church	ca. 1949	Visible
–	–	La00025	Central Hall Cottage	ca. 1955	Visible
–	–	La00026	Manufactured Home	ca. 1960	Visible
–	–	La00027	Rectangular Folk House	ca. 1945	Visible
–	–	La00028	Ranch House	ca. 1960	Visible
–	–	La00029	Ranch House	ca. 1967	Visible
–	–	La00030	Ranch House	ca. 1959	Visible
–	–	La00031	Barn	ca. 1963–1970	Visible

Inventory Number			Property Name/Description	Date	Relation to Project Site Viewshed
UA-OAS 1999 Survey[1]	TVAR 2020 Survey[2]	TVAR 2024 Survey			
–	–	La00032	Bride's Hill Cemetery[9]	ca. 1910–1953[8]	Visible
–	–	–	Swoope Cemetery No. 1[9,10]	ca. 1826–1927	Not Visible
–	–	–	Swoope Cemetery No. 2[9,10]	ca. 1827–1968	Not Visible
–	–	–	Unnamed Cemetery No. 2[9,11]	Pre-1933	Not Visible

[1] Reported in Ford 2000.
[2] Reported in Rael et al. 2021.
[3] Additional information for resource reported in Meeks and Carnell 2021.
[4] Tuscumbia, Courtland, and Decatur (1832–1851), Memphis and Charleston (1851–1894), and Southern (1894–1982).
[5] Resource destroyed between 1999 and 2021.
[6] Resource destroyed between 2021 and 2024.
[7] Both resources occur within the same parcel, and TVAR assigned these resources a single inventory number.
[8] Date range based on inscribed headstones (n=3) present (earliest 9/14/1910; latest 11/4/1953). A fourth grave is marked by a temporary metal placard with no information.
[9] In addition to these four cemeteries, five additional cemeteries (Hickman, Pippen, Sherrod/Wheeler, Unnamed Cemetery No. 1, and Unnamed Cemetery No. 3) are located within the APE. Hickman (pre-1827), Sherrod/Wheeler (ca. 1845–1970), and Unnamed Cemetery No. 1 (pre-1911) are located within the Pond Spring/Joseph Wheeler Plantation NRHP boundary and not within view of the Project Site. Two cemeteries located within the footprint of the Project Site (Pippen Cemetery and Unnamed Cemetery No. 3) were not included in the historic architectural survey.
[10] Reported in Remington 1999.
[11] Reported in Meeks et al. 2021.

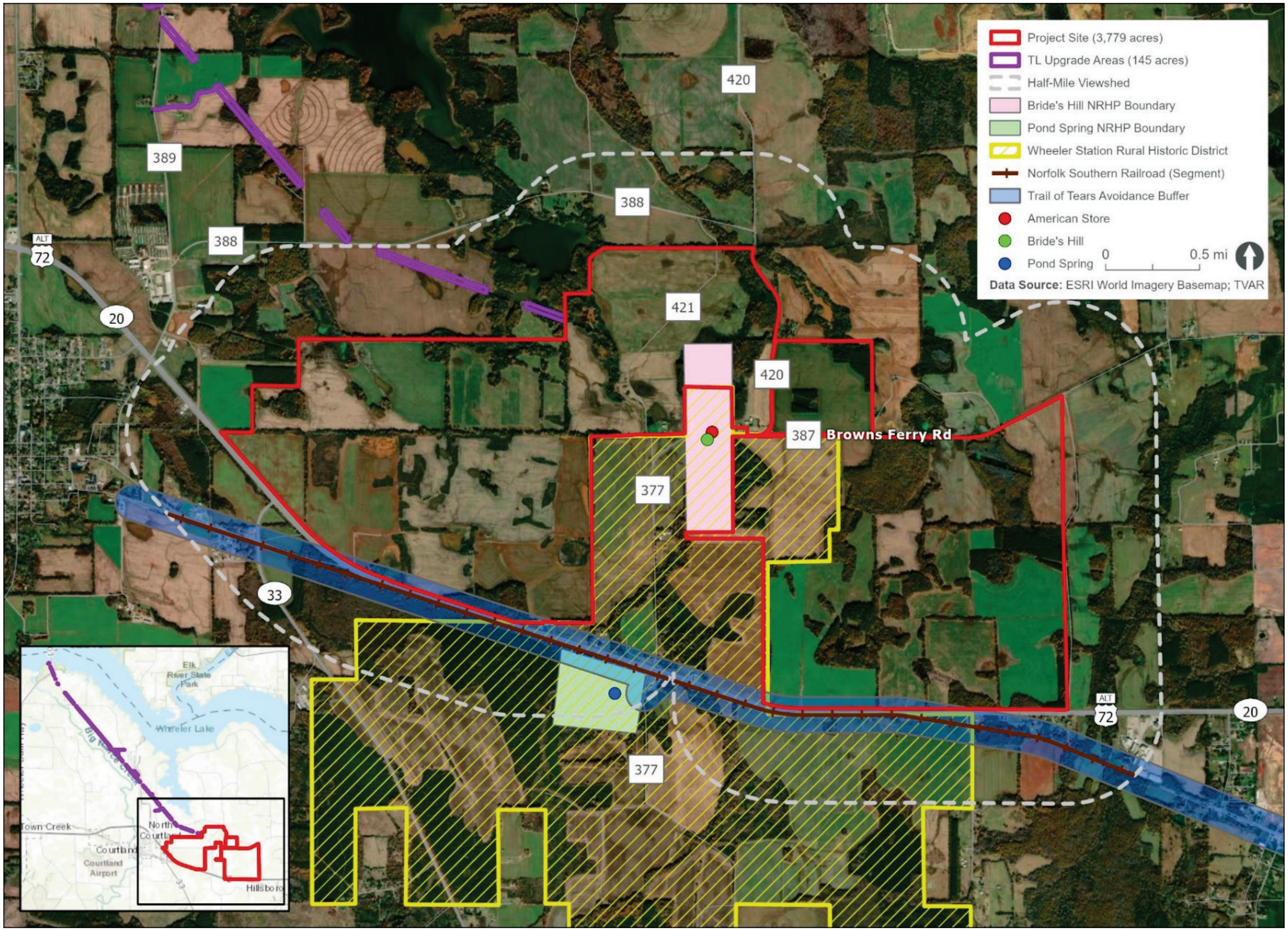

Figure 3-38. Architectural resources in the vicinity of the Project Site

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, there would be no Project-related impacts to cultural resources.

3.10.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, Hillsboro Solar, LLC would construct and operate a 200-MW AC single-axis tracking solar PV facility. The proposed undertaking, as currently planned, would not only physically alter the cultural landscape of the WSRHD, but it would also introduce new, modern elements to the historically rural landscape both within and in the immediate vicinity of the district (including, but not limited to, blocks of solar panels, a substation, a switching station, access roads, and security fencing). Collectively, the physical effects to the WSRHD, and related resultant visual effects, would alter historic characteristics that qualify the district for the NRHP by diminishing its integrity of location, design, setting, materials, workmanship, feeling, and association. As a result, the undertaking would cause both physical and visual adverse effects on the WSRHD, thereby altering characteristics qualifying the historic district for inclusion in the NRHP in a manner that diminishes its integrity. Therefore, TVAR recommends a finding of adverse effect for the WSRHD and TVA finds that the Project would have an adverse effect to the WSRHD.

However, any adverse effects (both physical and visual) to the WSRHD resulting from the proposed undertaking, if determined by TVA in consultation with AHC, have already been mitigated by measures taken in association with the adjacent North Alabama Utility-Scale Solar Facility. In addition to formulating and documenting the WSRHD (thereby functioning as a mitigation measure for the NRHP-eligible property in its own right), the findings presented in the resultant cultural resources assessment report (Meeks and Carnell 2021) served as the basis for the development of a NHPA Section 106 memorandum of agreement (MOA) between TVA and AHC to mitigate adverse effects of the North Alabama Utility-Scale Solar Facility to the WSRHD. The MOA, executed in December 2021, included three measures to mitigate adverse effects to the WSRHD: 1) production of a traveling exhibit on African American life in late nineteenth to mid twentieth-century Lawrence County and the WSRHD; 2) preparation of updated NRHP nomination forms for two listed properties (Bride’s Hill and Pond Spring/Joseph Wheeler Plantation) located within the WSRHD; and 3) construction of a wooden fence along the eastern boundary of the Pond Spring/Joseph Wheeler property in keeping with documented historical fencing. TVA has fulfilled or will continue to fulfill all stipulations in the NHPA Section 106 MOA.

Due to these mitigation measures in combination with the Project’s minimal physical and visual adverse effects to the WSRHD relative to the North Alabama Utility-Scale Solar Facility, TVAR recommends that no additional investigation or measures to avoid, minimize, or mitigate adverse effects to the WSRHD are warranted in connection with the undertaking provided that sites 1LA998 and 1LA1287 are not physically impacted during construction, operation, and maintenance of the solar facility. The Project would introduce a visual effect to the railroad segment associated with the Deas and Whiteley detachments of the Cherokee Trail of Tears. However, the historic setting of the property has already been compromised at various locations along the proposed NRHP boundary by modern development, including expansion of US 72A/SR 20, the presence of a TL corridor, and several modern buildings. Furthermore, the Project would not be physically located within the property’s proposed NRHP boundary and, thus, would not result in direct alteration of the railroad alignment. For these reasons, TVA finds that the Project would introduce a visual effect to the original alignment associated with the Tuscumbia, Courtland, and Decatur Railroad, but the effect would not be adverse. The Project would not compromise the physical integrity of the property or diminish the historical significance for which it is recommended eligible for the NRHP.

TVAR determined that the proposed undertaking, as currently planned, would introduce a visual effect to Bride's Hill and would physically impact approximately 40 acres of the northernmost portion of the NRHP property. However, the visual and physical effects to the property would not be adverse because this area has been significantly altered by the construction and maintenance of a TL corridor and recent logging activities. Therefore, TVA finds that the Project would introduce a physical effect to Bride's Hill, but the effect would not be adverse. No additional investigation of Bride's Hill is warranted in connection with the undertaking.

TVAR determined that the proposed undertaking, as currently planned, would introduce a visual effect to the American Store, but the effect would not be adverse, and no additional investigation of the American Store is warranted in connection with the undertaking. For these reasons, TVA finds that the Project would introduce a visual effect to the American Store, but the effect would not be adverse.

TVAR recommends that the short segment of L5669 located within the boundary of the WHP remain a contributing resource to the property's significance as an important part of TVA's hydroelectric project under Criterion A, and TVAR determined that the proposed undertaking would introduce both visual and physical effects to the NRHP-listed WHP. However, due to modern upgrades to this short segment of L5669, including the installation of a new structure on this segment in 2008 (Structure 1; slated for upgrades), and the proposed reconductoring of the Begin Structure (WHP Switchyard; contributing resource) is considered a form of routine maintenance that fails to negatively impact the structure or its integrity, TVAR determined that the undertaking, as currently planned, would not compromise the integrity of the NRHP-listed WHP or diminish its historical significance, for which it is listed in the NRHP. Therefore, TVAR recommends a finding of no adverse effect for the WHP, and no additional investigation of L5669 is warranted in connection with the undertaking. For these reasons, TVA finds that the Project would not compromise the integrity of the WHP or diminish its historical significance for which it is listed in the NRHP.

Overall, visual and physical adverse impacts to the WSRHD would be minimized through appropriate mitigation included in the previously executed MOA between TVA and AHC, no adverse visual impacts are anticipated to the railroad segment associated with the Deas and Whiteley detachments of the Cherokee Trail of Tears or to the American Store, and no adverse visual and physical impacts are anticipated to Bride's Hill or to the NRHP-listed WHP.

Per an agreement between TVA and Urban Grid, no disturbance of the 33 sites of undetermined eligibility status (all potentially eligible under Criterion D) will occur for the entire 20-year PPA without TVA's review and consultation with AHC and federally recognized tribes with an interest in the undertaking (Appendix C). Establishment of pollinator habitat and/or other vegetation management may occur within the avoidance buffer zones, but such activities would likely occur at or within a few inches of the ground surface, minimally impacting the soil. If warranted at a future time, during the 20-year PPA, such consultation would be conducted in accordance with federal regulations prior to any disturbance of these sites. TVA determined that, with avoidance of these 33 sites and the three cemeteries during the life of the undertaking, there would be no effect on these historic properties.

TVA is currently consulting with AHC and federally recognized tribes regarding TVA's eligibility determinations and effect findings.

3.10.2.3 Cumulative Impacts
The development of the adjacent North Alabama Utility-Scale Solar Facility would similarly introduce visual effects to the railroad segment associated with the Deas and Whiteley detachments of the Cherokee Trail of Tears, Bride's Hill, and the American Store; however, these visual effects would not be adverse. The development of the adjacent North Alabama Utility-Scale Solar Facility would also similarly introduce both visual and physical effects to the WSRHD; however, the three measures in the MOA between TVA and AHC mitigate adverse effects. While the other RFFAs may have adverse impacts on cultural resources, the Project would not contribute to cumulative impacts because the Project would not adversely impact any listed or eligible NRHP archaeological or architectural sites. TVA is consulting with AHC on these NRHP eligibility determinations.

3.11 Utilities

3.11.1 Affected Environment

3.11.1.1 Project Site
The Project Site is in a rural, unincorporated portion of northeastern Lawrence County, between the towns of Courtland and Hillsboro. In addition to various mobile providers, telecommunications services in the Project Site vicinity are provided by AT&T and Sardis Telecom (AT&T 2024; Sardis Telecom 2024).

Electrical service is provided by Joe Wheeler Electric Membership Cooperative (JWEMC), which distributes power provided by TVA (JWEMC 2024). Existing power lines are present in the area surrounding the Project Site along US 72A/SR 20, SR 33, and other major and minor roads in the vicinity. L5832 extends east–west through the Project Site and TVA's existing Browns Ferry NP–West Point 500-kV TL extends north–south through the Project Site.

Natural gas service is provided by North Alabama Gas District. Given their proximity to Courtland, the residences adjacent to the Project Site may have natural gas service (North Alabama Gas District 2024).

Due to being predominantly outside of incorporated municipality limits, water service in the Project Site vicinity is provided either by the West Morgan – East Lawrence Water and Sewer Authority (WMEL) or private wells and septic systems (WMEL 2024). Given their respective proximity to Courtland, the residences adjacent to the Project Site may have water service from WMEL.

3.11.1.2 TL Upgrade Areas
The TL Upgrade Areas extend east–northwest from the Project Site, crossing rural, unincorporated portions of Lawrence County, in the vicinity of Courtland. Utilities in the vicinity of the TL Upgrade Areas are the same as the Project Site and are generally described in Section 3.11.1.1.

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, there would be no Project-related impacts to utilities. Existing land use would remain a mix of agricultural and forested land for the foreseeable future, and existing on-site utilities would likely remain unchanged, except for potential upgrades and maintenance.

3.11.2.2 Proposed Action Alternative

3.11.2.2.1 Project Site

Modifications to existing electrical utilities would occur with implementation of the Proposed Action Alternative, including Project-related TL upgrade activities along L5832 and L5669. Electrical service for the Project would be provided by JWEMC. A service drop would be installed during construction to provide construction power and JWEMC would coordinate with customers if outages were necessary. The Project would obtain water by groundwater wells, by delivery via water trucks, or accessing existing available tap water via pipes already located on-site. There are no plans for additional features to be built off-site for water or sewer infrastructure.

No long-term adverse impacts would be associated with the Project. Implementation of the Proposed Action Alternative would result in additional renewable energy resources in the region and would, thus, constitute a beneficial impact to electrical services across the region.

3.11.2.2.2 TL Upgrade Areas

The Project-related TL upgrade activities may result in short-term adverse impacts to local utilities such as electrical service due to brief outages. The additional electric system modifications to existing TVA substations may require a temporary electric service outage of L5832 and L5669, lasting a minimum of a few days. If outages on these or other TLs are required, TVA would work with JWEMC to provide alternative means of providing electrical service to the area to avoid service interruptions. TVA would also try to perform these outages at low-impact times, such as overnight, to maintain power service to JWEMC. The environmental consequences for TL upgrade activities on utilities are the same as those described for the Project Site in Section 3.11.2.2.1.

3.11.2.3 Cumulative Impacts

The Project could cause occasional, short-term adverse impacts to local utilities, such as electricity, when conducting the TL upgrade activities, bringing the solar PV facility on-line, or during routine maintenance of the facility. Thus, the Project, along with the past, present, and RFFAs, may contribute to some minor short-term outages in the area surrounding the Project Site as these facilities are constructed or maintained. Given the nature of the Proposed Action, long-term cumulative adverse impacts to utilities are not anticipated.

3.12 Waste Management

3.12.1 Affected Environment

“Hazardous materials” and “hazardous waste” are substances that, because of their quantity, concentration, or characteristics (physical, chemical, or infectious), may present a danger to public health and/or the environment if released. These substances are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §§ 9601 *et seq.*) and the Solid Waste Disposal Act, as amended by the Resource

Conservation and Recovery Act ([RCRA]; 42 U.S.C. §§ 6901 *et seq.*). Regulated hazardous wastes under RCRA include any solid, liquid, contained gaseous, or semisolid waste or combination of wastes that exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or is listed as a hazardous waste under 40 CFR § 261. Storage and use of hazardous materials and wastes are regulated by local, state, and federal laws and regulations including the Emergency Planning and Community Right-to-Know Act (42 U.S.C. §§ 116 *et seq.*) and RCRA.

3.12.1.1 Project Site

According to historical aerial imagery and topographic maps, land use in the Project Site vicinity has remained relatively unchanged and dominated by agriculture and rural-residential land since at least the mid-1930s but likely earlier, based on historical trends.

Collection and disposal of solid waste outside of incorporated municipalities in Lawrence County is conducted by private trash collecting companies. Waste is collected at the Morris Farms Landfill. Various vendors offer hazardous waste removal.

3.12.1.2 TL Upgrade Areas

Waste management in the vicinity of the TL Upgrade Areas is the same as the Project Site and are generally described in Section 3.12.1.1.

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 waste would be generated and no impacts to waste management resources would occur. Existing land use would remain primarily agricultural land for the foreseeable future, and existing waste management conditions would remain as they are at present.

3.12.2.2 Proposed Action Alternative

3.12.2.2.1 Project Site

Under the Proposed Action Alternative, storage and use of liquid materials in the form of petroleum-based oils and fuels, and generation of liquid and solid wastes in the form of used oil, construction debris, packing materials, and general construction waste would occur during construction and would be moderate and temporary. 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.

3.12.2.2.1.1 Materials Management

During construction of the proposed solar facility, materials would be stored on-site in storage tanks, vessels, or other appropriate containers specifically designed for the characteristics of these materials. The storage facilities would include secondary containment in case of tank or vessel failure. Construction- and decommissioning-related materials stored on-site would primarily be liquids such as used oil, diesel fuel, gasoline, hydraulic fluid, and other lubricants associated with construction equipment. Safety Data

Sheets for all applicable materials present on-site would be made readily available to on-site personnel.

Fueling of some construction vehicles would occur in the construction area. Other mobile equipment would return to the on-site laydown areas for refueling. Special procedures would be identified to minimize the potential for fuel spills, and spill control kits would be carried on all refueling vehicles for activities such as refueling, vehicle or equipment maintenance procedures, waste removal, and tank clean-out. A fuel truck may be stored on-site for approximately 24–36 months during construction of the Project. The total volume of the on-site tanks would exceed 1,320 gallons, the threshold above which a SPCC plan would be required (40 CFR part 112). The facility would fall under USEPA's SPCC requirements of "oil-filled operational equipment" and a Tier I Qualified Facility; therefore, no double-walled protection would be required, and the SPCC plan would not have to be certified by a Professional Engineer (USEPA 2010). The SPCC plan would be prepared prior to construction to prevent oil discharges during facility operations.

During operations, bulk chemicals would be stored in storage tanks and other chemicals would be stored in returnable delivery containers. Chemical storage areas would be designed to contain leaks and spills. The transport, storage, handling, and use of chemicals would be conducted in accordance with applicable laws, ordinances, regulations, and standards. While the various transformers would contain oil, there would be no separate transformer oil stored on-site related to transformers. The quantities of these materials stored on-site would be evaluated to identify the required usage and to maintain sufficient inventories to meet use rates without stockpiling excess chemicals.

In addition to the chemicals listed above, small quantities (less than 55 gallons, 500 pounds, or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint, degreasers, pesticides, air conditioning fluids (chlorofluorocarbons), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the facility. Flammable materials (e.g., paints, solvents) would be stored in flammable material storage cabinet(s) with built-in containment sumps. Due to the small quantities involved and the controlled environment, a spill could be cleaned up without significant environmental consequences.

Hillsboro Solar, LLC would develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials (e.g., Hazardous Material Business Plan). Facility personnel would be supplied with appropriate personal protective equipment and would be properly trained in the use of personal protective equipment as well as the handling, use, and cleanup of hazardous materials used at the facility and the procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials would be stored on-site.

3.12.2.2.1.2 Waste Management

Construction, operation, and decommissioning of the Project would generate solid waste. Construction of the solar facility is estimated to result in the generation of approximately 48,640 cubic yards of solid waste (1,216 truckloads at 40 cubic yards each) consisting of construction debris and general trash, including pallets and flattened cardboard module boxes. Hillsboro Solar, LLC estimates that an additional 2,284 truckloads would be required for hauling equipment for a total of 3,500 truckloads during construction. Information on wastes anticipated to be generated during Project construction is provided in Table 3-29.

Table 3-29. Summary of construction waste streams and management methods

Waste stream	Origin and composition	Estimated frequency of generation	On-site treatment	Waste management method/off-site treatment
Construction waste – hazardous	Empty hazardous material containers	Intermittent	None	Return to vendor
Construction waste – hazardous	Used oil, hydraulic fluid, oily rags	Intermittent	None	Recycle, remove to off-site disposal location
Construction waste – non-hazardous	Steel, glass, plastic, wood/pallets, cardboard, paper	Intermittent	None	Recycle wherever possible, otherwise dispose to Class I landfill
Sanitary waste – non-hazardous	Portable chemical toilets – sanitary waste	Periodically pumped to tanker truck by licensed contractors	None	Ship to sanitary wastewater treatment plant

The anticipated quantities of waste produced during Project operation are summarized in Table 3-30. Universal wastes and unusable materials produced as a result of implementation of the Proposed Action would be handled, stored, and managed in accordance with federal and state requirements.

Table 3-30. Summary of operation waste streams and management methods

Waste stream	Origin and composition	Estimated amount	Estimated frequency of generation	Waste management method	
				On-site	Off-site
Used hydraulic fluid, oils, and grease – petroleum-related wastes	Tracker drives, hydraulic equipment	1,000 gallons per year	Intermittent	Accumulate for <90 days	Recycle
Oily rags, oil absorbent, and oil filters – petroleum-related wastes	Various	One 55-gallon drum per month	Intermittent	Accumulate for <90 days	Sent off-site for recovery or disposed at Class I landfill
Spent batteries	Lead acid/lithium ion	1,000	Every 10 years	Accumulate for <90 days	Recycle

Waste collection and disposal would be conducted in accordance with applicable regulatory requirements to minimize health and safety effects. To the extent possible, waste would be recycled. Materials that cannot be recycled would be disposed of at an approved facility to be determined by the designated contractor(s). No waste oil would be disposed of on the Project Site.

If necessary, Hillsboro Solar, LLC or the construction contractor would obtain a hazardous waste generator identification number from USEPA and the State of Alabama prior to generating any hazardous waste. Alabama has not established state-specific spill prevention plans in addition to the federal SPCC plan requirements. However, the state requires many types of facilities to maintain a current contingency plan, including hazardous waste treatment, storage, and disposal facilities; underground storage tanks that contain oil or hazardous substances; sites seeking NPDES permits for discharges; sites storing hazardous substances in aboveground tanks; and sites storing used oil. Standards for hazardous waste treatment, storage, and disposal facilities fall under Chapter 335-14 of the ADEM Administrative Code. Copies of any spill and cleanup reports would be kept onsite.

Hillsboro Solar, LLC, through designated contractor and subcontractor personnel, would be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced. Disposal containers such as dumpsters or roll-off containers would be obtained from a proper waste disposal contractor. Records of the amounts generated would be provided to the designated Hillsboro Solar, LLC environmental specialist.

3.12.2.2.1.3 Wastewater

Wastewater potentially generated during construction or operations may include domestic sewage and wastewater from non-detergent equipment washing and dust control. Portable toilets or other temporary facilities would be used for the construction workforce. Water used for equipment washing and dust control would be handled in accordance with BMPs described in the CBMPP. If an additive is required to help facilitate the cleaning process, the wastewater stream or the waste product would need to be evaluated to ensure wastewater is properly disposed of according to applicable federal, state, and local regulations. With application of these BMPs, no adverse effects would be anticipated from wastewater generated during the Project.

3.12.2.2.2 TL Upgrade Areas

Potential impacts and mitigation measures on waste management are similar to what is described for the Project Site in Section 3.12.2.2.1.

3.12.2.3 Cumulative Impacts

Past, present, and RFFAs, together with the Proposed Action, would create new waste streams within the area. Storage and use of liquid materials in the form of petroleum-based oils and fuels, and generation of liquid and solid wastes in the form of used oil, construction debris, packing materials, and general construction waste would also occur. Overall, the Project effects, likely similar to the past, present, and RFFAs, would be mitigated through implementation of BMPs for waste and wastewater, SPCC plans, and hazardous material business plans. With proper planning and implementation of BMPs, adverse reasonably foreseeable environmental trends and planned actions from the Project in relation to waste management would not occur.

3.13 Public and Occupational Health and Safety

3.13.1 Affected Environment

3.13.1.1 Project Site

The Project Site is currently private property and agricultural land use dominates. Public emergency services in the area include urgent care clinics, hospitals, law enforcement services, and fire protection services.

Lawrence Urgent Care, on SR 157 in Moulton, approximately 15 miles (20-minute drive) south of the Project Site, is the closest urgent care center to the Project Site. Lawrence Medical Center is the closest hospital, on Hospital Street in Moulton, approximately 14 miles (20-minute drive) south of the Project Site.

Law enforcement services in the town of Courtland are provided by the Courtland Police Department, approximately two miles (four-minute drive) west of the Project Site. Lawrence County law enforcement services are provided by the Lawrence County Sheriff's Office in Moulton, approximately 15 miles (20-minute drive) south of the Project Site. Fire protection services are provided by the Courtland Fire and Rescue and the Hillsboro Area Volunteer Fire Department, approximately two miles (four-minute drive) west of the Project Site and seven miles (seven minutes) east of the Project Site, respectively.

The Alabama Emergency Management Agency has the responsibility and authority to coordinate with state and local agencies in the event of a release of hazardous materials.

3.13.1.2 TL Upgrade Areas

The TL Upgrade Areas are within Lawrence County and agricultural land use dominates. Public emergency services in the area include urgent care clinics, hospitals, law enforcement services, and fire protection services.

Elgin Medical Center, on SR 101 in Rogersville, approximately five miles (eight-minute drive) north of the northern terminus of the TL Upgrade Areas, is the closest urgent care center to the TL Upgrade Areas. Lawrence Medical Center is the closest hospital, on Hospital Street in Moulton, approximately 16 miles (23-minute drive) south of the southern terminus of the TL Upgrade Areas.

Law enforcement services would be provided by the Courtland Police Department and Lawrence County Sheriff's Office and fire protection services would be provided by the Courtland Fire and Rescue and Red Bank Volunteer Fire Department.

3.13.2 Environmental Consequences

3.13.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts on public health and safety would result. Existing land use would remain primarily agricultural land for the foreseeable future, and existing public health and safety issues would be expected to remain as they are at present.

3.13.2.2 Proposed Action Alternative

3.13.2.2.1 Project Site

Under the Proposed Action Alternative, workers on the Project Site would have an increased safety risk during construction of the proposed solar facility. However, because construction work has known hazards, the standard practice is for contractors to establish and maintain health and safety plans in compliance with OSHA regulations. Health and safety plans emphasize BMPs for site safety management to minimize potential risks to workers. Examples of BMPs include employee safety orientations; establishment of work procedures and programs for site activities; use of equipment guards, emergency shutdown procedures, lockout procedures, site housekeeping, and personal protective equipment; regular safety inspections; and plans and procedures to identify and resolve hazards.

Potential public health and safety hazards could result from increased traffic on roadways due to construction of the Project. Residential, commercial, and other human use areas along roadways used by construction traffic to access the construction areas would experience increased employee, commercial, and industrial traffic. Awareness of these residences and establishment of traffic procedures to minimize potential safety concerns would be addressed in the health and safety plans followed by construction contractor(s).

Approximately 2,500 gallons of fuel for vehicles would be kept on the Project Site in storage tanks during construction of the proposed solar facility. An SPCC plan would be implemented to minimize the potential of a spill and to instruct on-site workers on how to contain and clean up any potential spills. The eight blocks of PV arrays, Hillsboro III Solar substation, and Bride's Hill switching station would be securely fenced during construction and for the duration of operation, and access gates would normally remain locked. General public health and safety would not be at risk in the event of an accidental spill on-site. Emergency response would be provided by the local, regional, and state law enforcement, fire, and emergency responders.

During operation, solar PV systems generate electromagnetic fields (EMF). However, according to a study published by North Carolina State University (2017), solar PV technologies and solar inverters do not pose significant human health risks. EMF produced by electricity has enough energy to produce heat but not enough to remove electrons from a molecule or damage DNA. Distance from the EMF source, such as provided by the solar panel setbacks and security fencing proposed to surround separate portions of the Project, renders the exposure to EMF insignificant and, therefore, not harmful to human health. The strength of the EMF present at the perimeter of a solar facility is substantially lower than the typical exposures to EMF from household sources such as microwave ovens, computers, and cell phones (NIEHS 2024).

Most of the increased safety risk occurs during construction, which would be completed within approximately 24–36 months, and the risks that have been identified are known, manageable risks. Overall, impacts to public health and safety in association with implementation of the Proposed Action would be considered temporary and minor.

3.13.2.2.2 TL Upgrade Areas

TLs, like all other types of electrical wiring, generate EMFs. The voltage on the conductors of a TL generates an electric field that occupies the space between the conductors and other conducting objects such as the ground, TL structures, or vegetation. A magnetic field is generated by the current (i.e., the movement of electrons) in the conductors. The strength of the magnetic field depends on the current, the design of the TL, and the distance from the TL. Most of this energy is dissipated within the ROW, and the residual very low amount is reduced to background levels near the ROW or energized equipment.

Magnetic fields can induce currents in conducting objects. Electric fields can create static charges in ungrounded, conducting materials. The strength of the induced current or charge under a TL varies with: (1) the strength of the electric or magnetic field, (2) the size and shape of the conducting object, and (3) whether the conducting object is grounded. Induced currents and charges can cause shocks under certain conditions by making contact with objects in an electric or magnetic field. The existing TLs have been designed to minimize the potential for such shocks by maintaining sufficient clearance between the conductors and objects on the ground. Stationary conducting objects, such as metal fences, pipelines, and highway guardrails that are near enough to the TL to develop a charge, would be grounded by TVA to prevent them from being a source of shocks.

TL construction and operation require a high level of safety risk management due to the dangers present when working near high-voltage equipment. Overall, impacts to public and occupational health and safety in association with the TL upgrade activities would be considered temporary and minor.

3.13.2.3 Cumulative Impacts

As with the past, present, and RFFAs, the Project would comply with OSHA regulations and health and safety plans to prevent or minimize the negative effects of worker-related accidents. The Project would also comply with SPCC plans, hazardous material plans, and other waste management BMPs to avoid or minimize related health and safety issues. With proper planning and implementation of BMPs, cumulative impacts from the Project in relation to public health and safety would not occur.

3.14 Transportation

3.14.1 Affected Environment

3.14.1.1 Roads

3.14.1.1.1 Project Site

The Project Site is bounded to the south by US 72A/SR 20, a four-lane divided federal highway connecting the midsized cities of Muscle Shoals and Decatur. Browns Ferry Road (CR 387) is a rural two-lane paved public road that extends east–west through the central portion of the Project Site and provides access to the Project Site via a connection with CR 377 to the west. CR 420 is a rural two-lane paved public road that extends north–south through the northeastern portion of the Project Site and provides access to the Project Site via a connection with Browns Ferry Road to the south and CR 388 to the north. CR 421 is a rural one-lane dirt road that extends north–south through the northern portion of the Project Site. CR 91 is a rural one-lane dirt road that extends north–south through the southwestern portion of the Project Site and provides access to the Project Site via a connection with US 72A/SR 20 to the south. There are also a few unnamed private dirt roads that extend through the Project Site.

3.14.1.1.2 TL Upgrade Areas

The TL Upgrade Areas extend northwest from the Project Site, terminating at the TVA Wheeler Hydroelectric Plant in Town Creek. Several access roads are proposed largely along routes that have already been cleared. Larger roadways, such as SR 101, CR 150, and CR 388 would be used to access the TL Upgrade Areas along with several smaller rural and local roadways.

3.14.1.2 Road Traffic

3.14.1.2.1 Project Site

Existing traffic volumes on some of the roads in the vicinity of the Project Site were determined using 2023 Annual Average Daily Traffic (AADT) counts measured at existing Alabama Department of Transportation (ALDOT) traffic count stations (ALDOT 2024b). Nine ALDOT stations are within two miles of the Project Site (Table 3-31).

Table 3-31. 2023 AADT counts on roadways near the Project Site

Station	Roadway	Distance from Project Site	AADT
545	US 72A/SR 20	0.0 mi south	13,020
546	US 72A/SR 20	0.0 mi south	14,422
21	US 72A/SR 20	0.1 mi west	12,723
38	Jefferson Street	0.6 mi west	1,213
544	US 72A/SR 20	1.0 mi northwest	11,622
943	Jessie Jackson Parkway	1.1 mi west	1,288
922	Main Street	1.3 mi southeast	1,494
514	SR 33	1.5 mi south	1,337
969	CR 150	2.0 mi northwest	2,619

Source: ALDOT 2024b

3.14.1.2.2 TL Upgrade Areas

Existing traffic volumes on some of the roads in the vicinity of the TL Upgrade Areas were determined using 2023 AADT counts measured at existing ALDOT traffic count stations (ALDOT 2024b). Eighteen ALDOT stations are within two miles of the TL Upgrade Areas (Table 3-32).

Table 3-32. 2023 AADT counts on roadways near the TL Upgrade Areas

Station	Roadway	Distance from TL Upgrade Areas	AADT
918	CR 150	25 feet west	2,470
919	CR 400	75 feet east	137
916	CR 150	0.1 mi northwest	1,960
538	SR 101	0.2 mi northeast	5,239
969	CR 150	0.7 mi west	2,619
544	US 72A/SR 20	1.0 mi southwest	11,622
10	CR 150	1.1 mi northeast	2,443
21	US 72A/SR 20	1.2 mi southwest	12,723
545	US 72A/SR 20	1.3 mi southwest	13,020
537	SR 101	1.4 mi southwest	3,661
623	SR 101	1.5 mi north	5,641
943	Jessie Jackson Parkway	1.5 mi southwest	1,288
917	CR 314	1.5 mi southwest	671
965	CR 400	1.5 mi northeast	124
546	US 72A/SR 20	1.6 mi south	14,422
38	Jefferson Street	1.7 mi southwest	1,213
12	CR 270	1.9 mi southwest	206
11	CR 270	2.0 mi southwest	258

Source: ALDOT 2024b

3.14.1.3 Rail and Air Traffic

3.14.1.3.1 Project Site

The closest rail line is operated by Norfolk Southern and parallels the south side of US 72A/SR 20, approximately 160 feet south of the Project Site. The closest general aviation airport is the Courtland Airport in Courtland, approximately 2.5 miles west of the Project

Site. The closest regional airport is the Northwest Alabama Regional Airport in Muscle Shoals, approximately 18 miles west of the Project Site. The closest major airport, and the only one in the vicinity with regular commercial passenger service, is the Huntsville International Airport in Huntsville, approximately 25 miles east of the Project Site.

3.14.1.3.2 TL Upgrade Areas

The closest rail line is operated by Norfolk Southern and parallels the east side of CR 150, approximately 140 feet east of the TL Upgrade Areas. The closest general aviation airport is the Courtland Airport in Courtland, approximately three miles southwest of the TL Upgrade Areas. The closest regional airport is the Northwest Alabama Regional Airport in Muscle Shoals, approximately 13 miles southwest of the TL Upgrade Areas. The closest major airport, and the only one in the vicinity with regular commercial passenger service, is the Huntsville International Airport in Huntsville, approximately 26 miles east of the TL Upgrade Areas.

3.14.2 Environmental Consequences

3.14.2.1 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 remain primarily agricultural land for the foreseeable future, and the existing transportation network and traffic conditions would be expected to remain as they are at present.

3.14.2.2 Proposed Action Alternative

3.14.2.2.1 Project Site

Under the Proposed Action Alternative, the development of the solar facility would result in minor direct impacts to road traffic due to an increase in construction related traffic in the vicinity of the Project Site. Subject to weather, construction activities would take approximately 24–36 months to complete using a crew of approximately 500 workers maximum. Work would generally occur during daylight hours for five to seven days a week. Some of these workers would likely come from the local area or region. Other workers could come from outside the region, and if so, many would likely stay in local hotels in the vicinity, including Decatur, Tuscumbia, and Moulton. Workers are anticipated to drive personal vehicles to the Project Site. Some of the individual workers and work teams would likely visit local restaurants and other businesses during the construction phase of the Project.

Due to the proximity of the Project Site to the towns of Courtland, Hillsboro, Decatur, Tuscumbia, and Moulton, possible minor to moderate traffic impacts along US 72A/SR 20 could occur, as a portion of the construction workers would likely commute to the Project Site from and through Courtland, Hillsboro, Decatur, Tuscumbia, and Moulton. Construction traffic would result in moderate impacts to roads in the immediate vicinity of the Project Site, primarily US 72A/SR 20, Browns Ferry Road, CR 377, CR 388, CR 420, and SR 33. Traffic flow around the Project Site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. Several businesses and residences are present along US 72A/SR 20, Browns Ferry Road, CR 388, and SR 33. The construction traffic would generally not interfere with visitor or periodic event traffic associated with Pond Spring, the General Joe Wheeler Home, as the home is directly accessed from US 72A/SR 20, and Project access is available from multiple directions and a variety of roads. Therefore, traffic to the Project Site would be more dispersed. Use of mitigation measures, such as posting a flag person during heavy commute periods to manage traffic flow, prioritizing access for local residents, and implementing staggered work shifts during daylight hours, would reduce potential adverse impacts to traffic and transportation.

Construction equipment and material delivery and waste removal would require an average of three to seven flatbed semi-trailer trucks or other large vehicles visiting the Project Site each day during the construction period. The Project Site would be accessed via routes that do not have load restrictions. These vehicles should be easily accommodated by existing roadways; therefore, only minor impacts to transportation resources in the area surrounding the Project Site would result from construction vehicle activity.

Construction and operation of the Project would have no effect on operation of airports in the region. The operation of the Project would not affect commercial air passenger or freight traffic in the region and would not adversely affect any aerial crop dusters operating in the vicinity of the Project Site.

Overall, direct impacts to transportation resources associated with implementation of the Proposed Action would be anticipated to be minor during construction due to the influx of workers and truckloads of construction equipment, materials, and waste removal traveling to and from the Project Site. These impacts would be temporary and minimized through appropriate mitigation. The Proposed Action would not result in any indirect impacts to transportation.

3.14.2.2.2 TL Upgrade Areas

Under the Proposed Action Alternative, the TL upgrade activities would result in minor direct impacts to road traffic due to an increase in construction related traffic in the vicinity of the TL Upgrade Areas.

3.14.2.3 Cumulative Impacts

The Project would implement minimization and mitigation measures if Project construction is expected to disrupt normal traffic patterns; thus, Project effects to road traffic would be temporary, minor, and minimized or mitigated. Effects to local, regional, and major airports are not anticipated. Past, present, and RFFAs are also expected to result in minor impacts to transportation. The development of the adjacent North Alabama Utility-Scale Solar Facility would similarly introduce up to 500 workers for approximately 24–36 months during construction. Together with the Proposed Action, up to 1,000 workers could contribute to cumulative impacts to traffic, depending on the timing of that project. If construction of both projects occurs at the same time, construction traffic would result in moderate to large impacts to US 72A/SR 20, Browns Ferry Road, CR 377, CR 388, CR 420, and SR 33.

The other RFFAs could also contribute to cumulative impacts to traffic depending on the timing of those projects. However, impacts would be short-term, and coordination could occur to minimize impacts to local commuters. Overall, with implementation of minimization and mitigation measures, the Proposed Action, when considered with the past, present, and RFFAs, would have moderate to large cumulative impacts to area transportation.

3.15 Socioeconomics

3.15.1 Affected Environment

3.15.1.1 Project Site

The Project Site is in an unincorporated portion of northeastern Lawrence County, between the towns of Courtland and Hillsboro. The Project Site overlaps U.S. Census Bureau (USCB) 2020 Census Tract (CT) 9791 Block Group (BG) 2 and CT 9792.01 BG 2 and is within one mile of CT 9791 BG 1 and CT 9792.02 BG 1, these CT BGs in combination with the CT BGs described for the TL Upgrade Areas are referred to as the Project area throughout Sections 3.15 and 3.16 (Figure 3-39). CT 9791 encompasses northeastern portions of Lawrence County and includes the entire town of Hillsboro and portions of the unincorporated community of Wheeler. CT 9792.01 encompasses northwestern portions of Lawrence County and includes the entire town of North Courtland and portions of Courtland, Town Creek, and Wheeler. CT 9792.02 encompasses northwestern portions of Lawrence County and includes most of Courtland and Town Creek. Lawrence County is primarily rural and includes only small clusters of densely populated areas.

3.15.1.2 TL Upgrade Areas

The TL Upgrade Areas are in an unincorporated portion of northeastern Lawrence County, between the towns of Courtland and Town Creek. The TL Upgrade Areas overlap CT 9792.01 BGs 1 and 2 and are within one mile of CT 9791 BG 2, CT 117 BG 2, and CT 118.02 BG 1 (Figure 3-39). CT 9791 and CT 9792.01 are characterized in Section 3.15.1.1. CT 117 encompasses eastern portions of Lauderdale County and includes the entire town of Lexington and the unincorporated community of Elgin. CT 118.02 encompasses eastern portions of Lauderdale County and includes most of the town of Rogersville. Lauderdale County is primarily rural and includes only small clusters of densely populated areas.

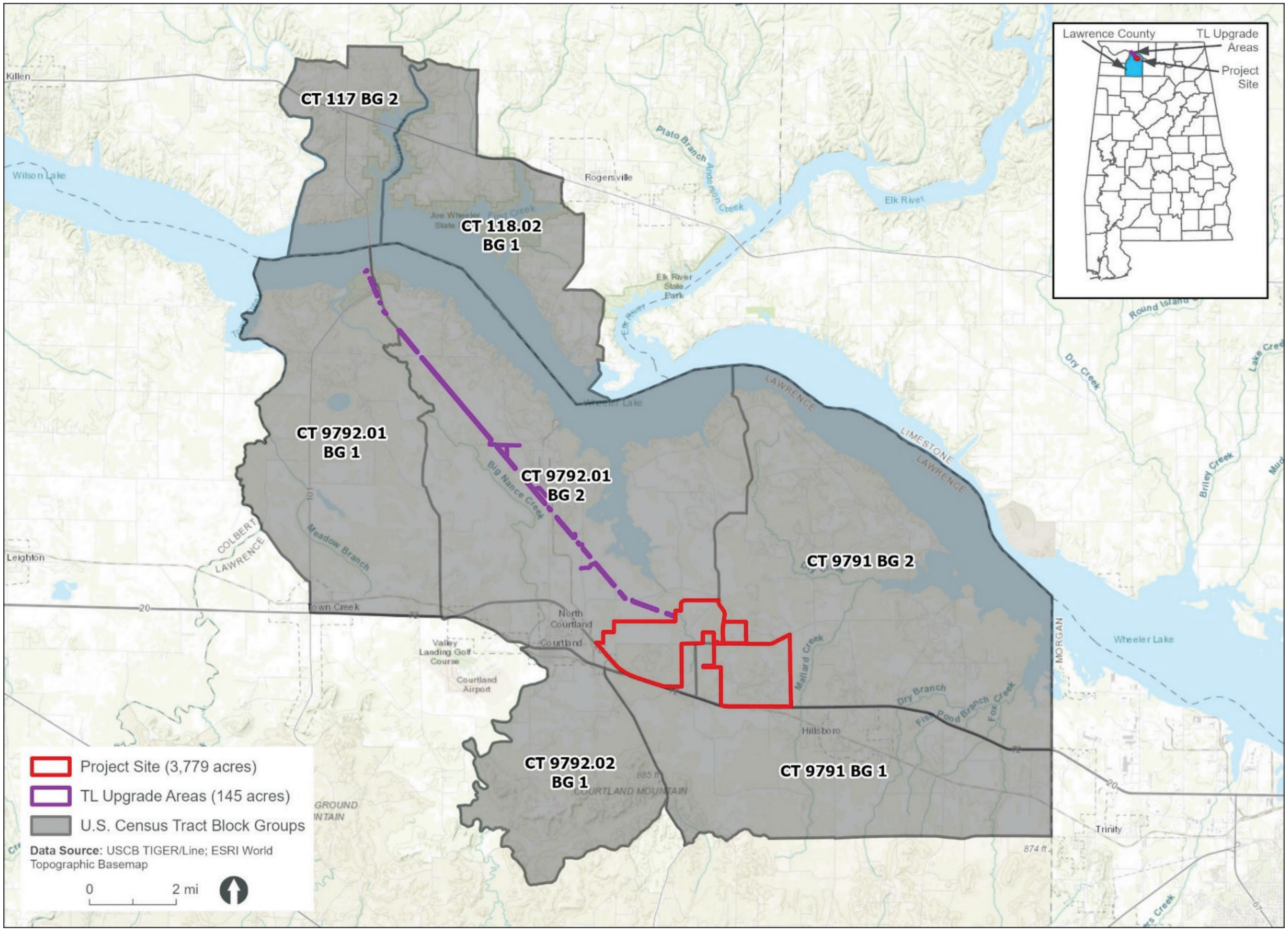

Figure 3-39. U.S. Census Tract Block Groups in the vicinity of the Project Site and TL Upgrade Areas

3.15.1.3 Population and Demographics

Population data for the affected BGs, counties, and state are provided in Table 3-33, based on the 2010 Census and the 2020 Census. As shown, from 2010 to 2020, three of the four affected BGs with data available and Lawrence County recorded population losses while the remaining affected BG with data available, Lauderdale County, and the state recorded population growth. The Alabama State Data Center (2024) projects that the population of Lawrence County would continue to decrease, and the population of Lauderdale County and the state would continue to increase by 2040.

Table 3-33. Population trends in the Project area, counties, and state

Geography	2010 Census	2020 Census	% Change 2010–2020	Projection 2040	% Change 2020–2040
Alabama	*4,779,736*	*5,024,279*	*5.1*	*5,588,829*	*11.2*
Lawrence County	*34,339*	*33,073*	*-3.7*	*31,523*	*-4.7*
CT 9791 BG 1	1,078	964	-10.6	—	—
CT 9791 BG 2[a]	590	559	-5.3	—	—
CT 9792* BG 1	1,067	—	—	—	—
CT 9792* BG 2	723	—	—	—	—
CT 9792.01 BG 1[b]	—	902	—	—	—
CT 9792.01 BG 2[a,b]	—	972	—	—	—
CT 9792.02 BG 1	—	492	—	—	—
Lauderdale County	*92,709*	*93,564*	*0.9*	*99,172*	*6.0*
CT 117 BG 2	1,257	1,272	1.2	—	—
CT 118.02 BG 1	1,380	1,155	-16.3	—	—

Sources: Alabama State Data Center 2024; USCB 2010; USCB 2020
[a] Project Site lies partially within CT 9791 BG 2 and CT 9792.01 BG 2.
[b] TL Upgrade Areas lie partially within CT 9792.01 BGs 1 and 2.
* CT 9792 was split into CTs 9792.01 and 9792.02 for the 2020 Census.
"—" indicates that no data is available.

According to the 2018–2022 American Community Survey (ACS) 5-Year Estimates (2022 ACS), the population of five of the seven affected BGs have higher median ages than the counties and state (USCB 2022a).

3.15.1.4 Employment and Income

Employment and income data for the affected BGs, counties, and state are provided in Table 3-34, based on the 2022 ACS and Bureau of Labor Statistics (BLS). As shown, four of the seven affected BGs have higher percentages of civilians in the labor force than the counties and state. CT 9792.01 BG 2 and CT 9792.02 BG 1 have much lower percentages of civilians in the labor force and median household incomes than the other affected BGs, counties, and state.

Table 3-34. Employment and income in the Project area, counties, and state

Geography	% Civilian Labor Force of Entire Pop., 2022 ACS	Unemployment Rate, 2022 ACS	Unemployment Rate, Oct 2024, BLS	Median Household Income ($), 2022 ACS
Alabama	*58.0*	*5.1*	*2.9*	*59,609*
Lawrence County	*53.2*	*3.6*	*3.0*	*54,786*
CT 9791 BG 1	64.0	3.4	—	61,333
CT 9791 BG 2[a]	68.9	0.0	—	54,242
CT 9792.01 BG 1[b]	54.5	0.6	—	60,256
CT 9792.01 BG 2[a,b]	40.9	6.8	—	34,750
CT 9792.02 BG 1	38.5	2.2	—	48,333
Lauderdale County	*58.0*	*3.0*	*3.1*	*56,081*
CT 117 BG 2	68.5	1.5	—	48,071
CT 118.02 BG 1	59.2	3.9	—	82,962

Sources: USCB 2022b; USCB 2022c; BLS 2024a; BLS 2024b; BLS 2024c
[a] Project Site lies partially within CT 9791 BG 2 and CT 9792.01 BG 2.
[b] TL Upgrade Areas lie partially within CT 9792.01 BGs 1 and 2.
"—" indicates that no data is available.

The top three industries for the affected BGs, counties, and state are provided in Table 3-35, based on the 2022 ACS. Educational services, and health care and social assistance; manufacturing; and retail trade are important industries for the area (USCB 2022d).

Table 3-35. Top industries in the Project area, counties, and state

Geography	Ranking		
	Highest Percentage	**Second Highest Percentage**	**Third Highest Percentage**
Alabama	*Educational services, and health care and social assistance (22.5%)*	*Manufacturing (14.2%)*	*Retail trade (11.7%)*
Lawrence County	*Educational services, and health care and social assistance (21.9%)*	*Manufacturing (21.8%)*	*Retail trade (12.8%)*
CT 9791 BG 1	Manufacturing (26.3%)	Educational services, and health care and social assistance (17.6%)	Finance and insurance, and real estate, and rental and leasing (10.4%)
CT 9791 BG 2[a]	Educational services, and health care and social assistance (30.9%)	Retail trade (30.7%)	Agriculture, forestry, fishing and hunting, and mining (16.8%)
CT 9792.01 BG 1[b]	Retail trade (35.5%)	Manufacturing (33.3%)	Educational services, and health care and social assistance (13.2%)

Geography	Ranking		
	Highest Percentage	**Second Highest Percentage**	**Third Highest Percentage**
CT 9792.01 BG 2[a,b]	Manufacturing (27.1%)	Educational services, and health care and social assistance (21.1%)	Arts, entertainment, and recreation, and accommodation and food services (9.9%)
CT 9792.02 BG 1	Manufacturing (34.3%)	Transportation and warehousing, and utilities (18.2%)	Retail trade (13.3%)
Lauderdale County	*Educational services, and health care and social assistance (21.0%)*	*Retail trade (16.3%)*	*Manufacturing (15.1%)*
CT 117 BG 2	Professional, scientific, and management, and administrative, and waste management services (32.5%)	Retail trade (30.6%)	Educational services, and health care and social assistance (14.4%)
CT 118.02 BG 1	Professional, scientific, and management, and administrative, and waste management services (21.1%)	Educational services, and health care and social assistance (19.6%)	Retail trade (18.3%)

Source: USCB 2022d
[a] Project Site lies partially within CT 9791 BG 2 and CT 9792.01 BG 2.
[b] TL Upgrade Areas lie partially within CT 9792.01 BGs 1 and 2.

Table 3-36 describes the changes in the number of farms and acreage of land in farms from 2017 to 2022 for the county and the state, and the county ranking of the market value of agricultural products sold.

Table 3-36. Farming statistics for the county and state

	Number of Farms			Land in Farms (Acres)			Market Value of Agricultural Products Sold (Ranking)		
	2017	**2022**	**Change 2017–2022**	**2017**	**2022**	**Change 2017–2022**	**2017**	**2022**	**Change 2017–2022**
Lawrence County	1,252	1,139	-113 (-9%)	213,747	209,398	-4,349 (-2%)	5[a]	7[a]	-2
Alabama	40,592	37,362	-3,230 (-8%)	8,580,940	8,629,101	+48,161 (+1%)	25[b]	23[b]	+2

Sources: USDA 2019a; USDA 2019b; USDA 2024b; USDA 2024c
[a] Out of 67 counties
[b] Out of 50 states

3.15.2 Environmental Consequences

3.15.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to socioeconomics would occur. Existing socioeconomic conditions would remain as they are at present or change at approximately the current rate.

3.15.2.2 Proposed Action Alternative

3.15.2.2.1 Project Site

Under the Proposed Action Alternative, a new solar facility would be built in the Project area. Subject to weather, construction activities would take approximately 24–36 months to complete using a crew of approximately 500 workers maximum. Work would generally occur during daylight hours for five to seven days a week. Short-term beneficial economic impacts would result from construction activities associated with the Project, including the purchase of materials, equipment, and services and a temporary increase in employment and income. This increase would be local or regional, depending on where the goods, services, and workers were obtained. Some construction materials and services would likely be purchased locally in Lawrence County and/or in adjacent counties. Most of the other components of the solar and transmission facilities would be acquired from outside the local area. The direct impact to the economy associated with construction of the Project would be short-term and beneficial.

Most of the indirect employment and income impacts would come from the expenditure of the wages earned by the workforce involved in construction activities, as well as the local workforce used to provide materials and services. This could result in increased sales to businesses nearby and on route to the Project Site. Therefore, construction of the proposed solar facility could have minor, beneficial, short-term, indirect impacts to the local economy in Lawrence County.

During operations, the Project may require small groups of staff to be on-site occasionally to manage the facility and conduct regular inspections, as well as some part-time permanent staff and/or contract employees that manage vegetation on the Project Site. Therefore, operation of the solar facility would have minor beneficial impacts on employment in the Project area.

The Project has been designed to minimize impacts to adjacent and nearby properties and is not expected to negatively affect area property values. Implementation of a 300-foot solar facility setback from US 72A/SR 20 could minimize effects on property values.

Overall, socioeconomic impacts for the operation of the proposed solar facility would be beneficial and long-term, but minor relative to the total economy of the region.

3.15.2.2.2 TL Upgrade Areas

TVA would install approximately five and seven miles of OPGW on L5832 and L5669, respectively. TL upgrades would require improvements to existing access roads, construction of temporary access roads, replacement of one TL structure, and installation of four new TL pole structures. The proposed upgrade activities and construction of temporary access roads would result in a minor temporary increase in employment.

3.15.2.3 Cumulative Impacts

Economic benefits of the Proposed Action and the past, present, and RFFAs considered for this analysis include the purchase of materials, equipment, and services, and moderate short- to long-term increases in employment and income. These increases would be local or regional, depending on where the goods, services, and workers have been or are obtained. The development of the adjacent North Alabama Utility-Scale Solar Facility would similarly introduce up to 500 workers for approximately 24–36 months during construction. Together with the Proposed Action, up to 1,000 workers could contribute to cumulative impacts to socioeconomics, depending on the timing of that project. Nearby towns and cities provide sufficient infrastructure and resources to support the influx of workers during the construction period. Overall, short- to long-term, moderate beneficial cumulative impacts to socioeconomics would result from implementation of the Proposed Action in combination with the other actions considered in the area. Indirect, cumulative impacts to socioeconomics would also occur from the expenditure of wages earned by the workforce involved in construction activities and facility operations.

3.16 Environmental Justice

3.16.1 Affected Environment

Environmental justice (EJ) is defined in EO 14096 as “just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment.” EJ-related impacts are analyzed to identify and address, as appropriate, disproportionate and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations, as guided by EO 12898 and EO 14096. EJ is analyzed in accordance with EO 12898 and EO 14096, which directs federal agencies to identify and address, as appropriate, potential disproportionate and adverse effects of their programs, policies, and activities on minority and low-income populations.

Council on Environmental Quality (CEQ) guidance directs identification of communities with EJ concerns. Communities with EJ concerns include minority populations, low-income populations, and tribal populations.

CEQ guidance for applying EO 12898 under NEPA directs the identification of minority populations when either the minority population of the affected area exceeds 50 percent, or the minority population percentage of the study area is meaningfully greater than the minority population percentage in the general population or another appropriate unit of geographic analysis (CEQ 1997). CEQ defines minority populations as people who identify themselves as Asian or Pacific Islander, American Indian or Alaskan Native, Black (not of Hispanic origin), Hispanic, some other race, or those indicating two or more races (i.e., all USCB race and ethnic categories apart from White Alone [One Race White]). Within the Project area and in addition to the above thresholds, minority communities with EJ concerns were defined as the BGs with minority percentages that were 10 percent or more above the state percentage or both the county and state percentages (i.e., each BG’s minority percentage must be at least 110 percent of the state's and/or county’s minority percentage to qualify as a community with EJ concerns in this analysis). The pertinent thresholds are displayed in each of the following tables.

CEQ guidance specifies that low-income populations are to be identified using the annual statistical poverty threshold from the USCB Current Population Report Number P60-283, *Poverty in the United States: 2023*. The current (2023) USCB-provided poverty threshold for individuals under age 65 is $15,852, and the official 2023 poverty rate for the U.S. is currently 11.1 percent (USCB 2024). Low-income populations may also be identified by comparing study area income and poverty rates with the county and/or state data using current USCB Small Area Income and Poverty Estimates (SAIPE) (USCB 2022e), as recommended by USCB.

For purposes of this analysis, low-income populations were defined as areas where poverty rates are less than two times the poverty level (i.e., those with poverty ratios defined in the

2022 ACS as 1.99 or lower), poverty rates that were five percent or more above the county and state percentage (i.e., at least 105 percent of the poverty rate of the county), and per capita income measurements that were five percent or more below the county measurement (i.e., those with per capita income at least 95 percent of the per capita income measurement of the county). While twice the poverty threshold criterion is more encompassing than the base poverty level, this low-income threshold, also used by USEPA in USEPA's delineation of low-income populations, is an appropriate measure for EJ consideration because current poverty thresholds are often too low to adequately capture the populations adversely affected by low-income levels, especially in high-cost areas (USEPA 2019). According to USEPA, the effects of income on baseline health and other aspects of susceptibility are not limited to those below the poverty thresholds. For example, populations having an income level from one to two times the poverty level also have worse health overall than those with higher incomes (Centers for Disease Control and Prevention 2011).

CEQ guidance directs the identification of groups demonstrating differential patterns of consumption of natural resources among minority and low-income populations, or tribal populations. The U.S. Bureau of Indian Affairs (BIA) Tract Viewer was used to identify if tribal areas are known to exist within a 10-mile radius of the Project Site or TL Upgrade Areas (BIA 2023).

Pursuant to Title VI of the Civil Rights Act (42 U.S.C. § 2000d *et seq.*), U.S. Department of Justice (DOJ) Guidance, and EO 13166, the Limited English Proficiency (LEP) populations were also assessed for the Project area. Based on DOJ LEP guidance, LEP language groups that constitute five percent or 1,000 individuals, whichever is less, should be offered translated project materials, where relevant. Eligible LEP language groups are defined herein as those whose members self-report speaking English less than well, based on the 2022 ACS.

3.16.1.1 Low-Income and Poverty Populations

The BGs emboldened in Table 3-37 represent areas with qualifying low-income communities with EJ concerns. Based on the 2022 SAIPE, the proportion of the population living in poverty for both Lawrence and Lauderdale counties was similar to that of the state. Poverty ratios of BGs were compared to that of the county in which each is located. Based on the 2022 ACS, three of the five BGs in Lawrence County had a higher percentage of people living in poverty than the county and are defined as the areas where the chance for disproportionate environmental and human health effects may be the greatest.

Table 3-37. Poverty in the Project area, counties, and state

Geography	% Persons in Poverty, 2022 SAIPE	% Households Below Poverty Level, 2022 ACS	Poverty Ratio, Two Times U.S. Threshold*, 2022 ACS	Per Capita Income ($), 2022 ACS
Alabama	*16.2*	*15.9*	*34.8*	*33,344*
Lawrence County	*16.4*	*15.5*	*37.5*	*29,486*
Low-income EJ Threshold to Meet or Exceed	*17.2*	*16.3*	—	*28,011*
CT 9791 BG 1	—	9.8	27.3	32,994
CT 9791 BG 2[a]	—	10.9	31.8	30,883
CT 9792.01 BG 1[b]	—	16.0	**52.8**	**26,918**
CT 9792.01 BG 2[a,b]	—	**30.3**	**44.5**	**24,181**

Geography	% Persons in Poverty, 2022 SAIPE	% Households Below Poverty Level, 2022 ACS	Poverty Ratio, Two Times U.S. Threshold*, 2022 ACS	Per Capita Income ($), 2022 ACS
CT 9792.02 BG 1	—	**22.7**	**46.9**	**21,432**
Lauderdale County	*13.3*	*14.8*	*32.4*	*32,678*
Low-income EJ Threshold to Meet or Exceed	*14.0*	*15.5*	—	*31,044*
CT 117 BG 2	—	4.7	22.9	33,386
CT 118.02 BG 1	—	2.7	7.3	45,428

Sources: USCB 2022e; USCB 2022f; USCB 2022g; USCB 2022h
[a] Project Site lies partially within CT 9791 BG 2 and CT 9792.01 BG 2.
[b] TL Upgrade Areas lie partially within CT 9792.01 BGs 1 and 2.
* Calculated based on percentage of population with a ratio of income to poverty threshold ≤1.99.
Emboldened BGs represent identified communities with EJ concerns as compared with the respective county percentage.
"—" indicates that no data is available.

3.16.1.2 Minority Populations

The BGs emboldened in Table 3-38 represent areas with qualifying minority communities with EJ concerns. Minority populations of BGs were compared to that of the county in which each is located. Based on the 2022 ACS, minority populations in four of the five BGs in Lawrence County exceeded the 50 percent threshold noted in CEQ guidance and all five BGs in Lawrence County and one of the two BGs in Lauderdale County had a minority percentage that exceeded the county percentages and are defined as the areas where the chance for disproportionate environmental and human health effects may be the greatest (Figure 3-40). As shown in Table 3-38, these minority percentages are due to high percentages of Black or African American populations.

3.16.1.3 Tribal Populations

According to BIA mapping, no tribal areas are known to exist within a 10-mile radius of the Project Site or TL Upgrade Areas (BIA 2023). As shown in Table 3-38, some individuals living in the Project area identify as either American Indian or Alaska Native. Based on the location of the Project area within the country, most of those individuals are likely American Indian rather than Alaska Native. According to the 2022 ACS, one BG in Lawrence County and both BGs in Lauderdale County had higher percentages of their population identifying as American Indian or Alaska Native as compared to their associated county. CT 9791 BG 1 had an estimated 6.9 percent American Indian or Alaska Native as compared to Lawrence County at 5.0 percent. CT 117 BG 2 and CT 118.02 BG 1 had an estimated 1.3 and 0.4 percent, respectively, as compared to Lauderdale County at 0.2 percent.

3.16.1.4 Limited English Proficiency Populations

Based on the 2022 ACS, CT 9791 BG 1 had 71 individuals (7.3 percent of the population aged five years or older) who reported speaking English less than well, all of which speak Spanish (USCB 2022j). Since this exceeds the five percent threshold noted in DOJ LEP guidance, this LEP language group should be offered translated project materials. CT 9792.01 BG 2 had eight individuals (one percent of the population aged five years or older) who reported speaking English less than well. Since this does not exceed the five percent threshold noted in DOJ LEP guidance, the need for translated project materials for this population is not warranted unless requested.

Table 3-38. Minority percentages and ethnicities in the Project area, counties, and state

Geography	% Minority	% White[1]	% Black / African Am.	% Am. Indian / Alaska Native	% Asian	% Native Hawaiian / Pacific Islander	% Some Other Race	% Two or More Races	% Hispanic / Latino[2]
Alabama	*35.4*	*64.6*	*26.2*	*0.3*	*1.4*	*<0.1*	*0.3*	*2.6*	*4.6*
Lawrence County	*23.7*	*76.3*	*10.2*	*5.0*	*0.3*	*<0.1*	*<0.1*	*5.6*	*2.5*
Minority EJ Threshold to Meet or Exceed	*26.1*								
CT 9791 BG 1	**85.5**	14.5	64.1	6.9	0.0	0.0	0.4	1.4	12.8
CT 9791 BG 2[a]	**28.4**	71.6	28.4	0.0	0.0	0.0	0.0	0.0	0.0
CT 9792.01 BG 1[b]	**55.9**	44.1	51.8	0.0	0.0	0.0	0.0	3.8	0.3
CT 9792.01 BG 2[a,b]	**68.7**	31.3	66.7	0.1	0.0	0.0	0.0	1.0	0.8
CT 9792.02 BG 1	**44.4**	55.6	39.2	0.5	0.0	0.0	0.0	4.7	0.0
Lauderdale County	*16.6*	*83.4*	*9.7*	*0.2*	*0.6*	*<0.1*	*0.1*	*2.9*	*3.0*
Minority EJ Threshold to Meet or Exceed	*18.3*								
CT 117 BG 2	4.4	95.6	1.7	1.3	0.0	0.0	0.0	1.4	0.0
CT 118.02 BG 1	**21.7**	78.3	16.1	0.4	1.1	0.0	0.0	0.8	3.3

Source: USCB 2022i
[1] Race percentages are provided for those reporting a particular race alone or in combination.
[2] This group is calculated separately from the other ethnicities and may include overlap from the other categories, because USCB does not consider Hispanic or Latino a "race."
[a] Project Site lies partially within CT 9791 BG 2 and CT 9792.01 BG 2.
[b] TL Upgrade Areas lie partially within CT 9792.01 BGs 1 and 2.
Emboldened BGs represent identified communities with EJ concerns as compared with the respective county percentage.

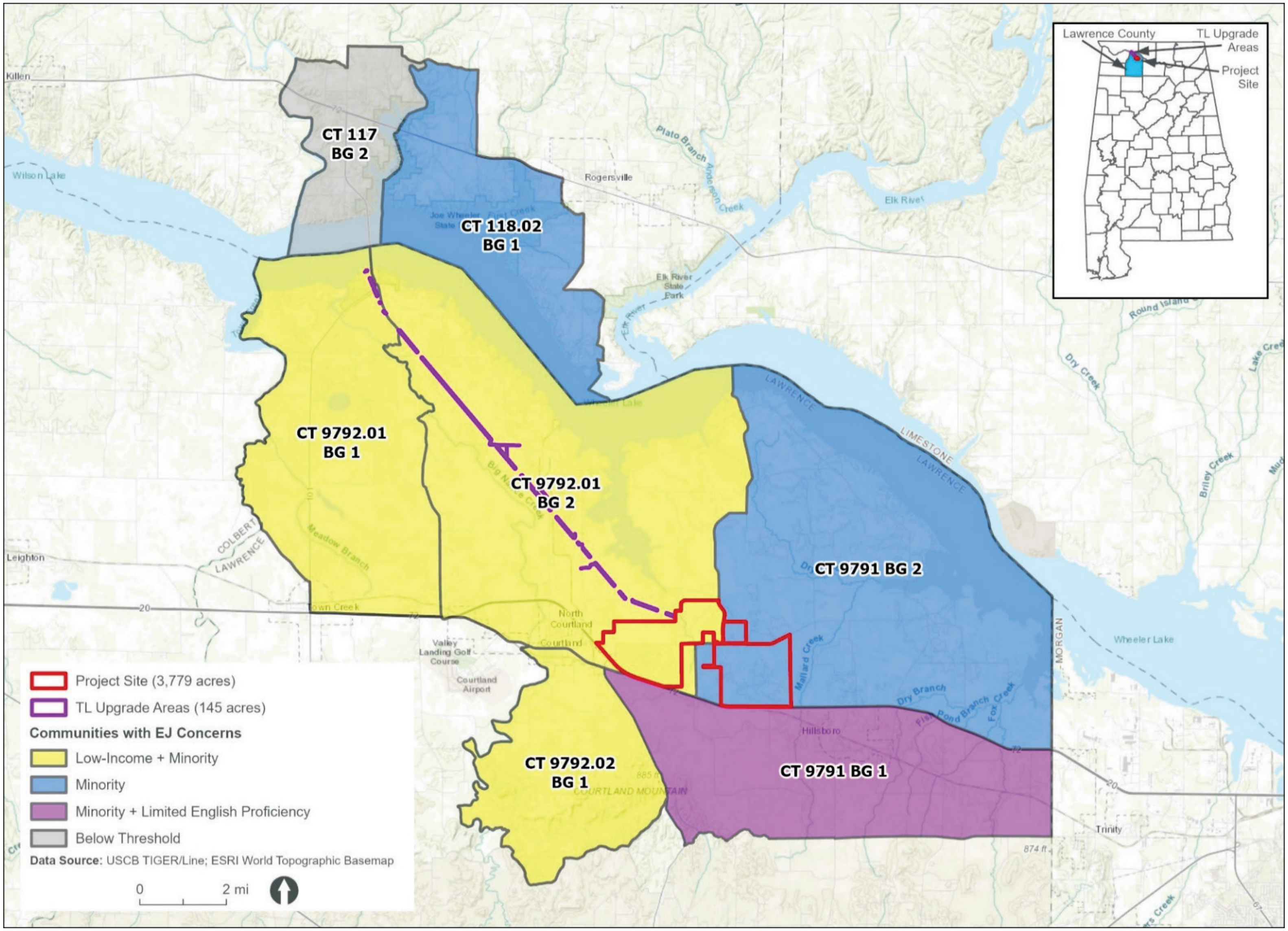

Figure 3-40. Communities with Environmental Justice Concerns in the vicinity of the Project Site and TL Upgrade Areas

3.16.1.5 Qualifying Communities with Environmental Justice Concerns

Additional data for the qualifying communities with EJ concerns (the five BGs in Lawrence County and one BG in Lauderdale County) is provided in Table 3-39, along with comparison data for the county and state. The top three areas of employment by industry for each of the qualifying BGs are provided in Table 3-36, based on the 2022 ACS. Educational services, and health care and social assistance; manufacturing; and retail trade are important industries for the area (USCB 2022d).

EJ indices, available from USEPA's online EJScreen tool, displayed the levels of environmental pollutants present among the six qualifying communities with EJ concerns (USEPA 2024b). These indicators were examined to determine the risk of negative health impacts for residents living within these BGs. The 13 indicators that were examined included $PM_{2.5}$, ozone, NO_2, diesel PM, toxic releases to air, traffic proximity, lead paint, Superfund proximity, Risk Management Program (RMP) facility proximity, hazardous waste proximity, underground storage tanks, wastewater discharge, and drinking water non-compliance. Indicator levels of 50 or greater were considered to have above average pollution levels (above the 50^{th} percentile as compared to the state).

The results of this examination indicated that most of the qualifying communities with EJ concerns in the area generally contained above average levels of pollution. Therefore, these groups may be at risk for disproportionate and cumulative negative health impacts.

Five of the six qualifying communities with EJ concerns examined scored above average pollution and indicated six or more environmental indicators above the 50^{th} percentile in comparison with the state. The qualifying communities with EJ concerns and the environmental indicator percentiles are shown in Table 3-40. Those with above average pollution levels (above the 50^{th} percentile) are emboldened. The highest percentile (90^{th}) in the qualifying communities with EJ concerns occurs in CT 9791 BG 1 and CT 9792.01 BG 2 for toxic releases to air and in CT 9792.01 BG 1 for drinking water non-compliance.

Table 3-39. Additional data for the qualifying communities with EJ concerns

Geography	% Minority	Poverty Ratio, Two Times U.S. Threshold	% Speak English Less than Well	% Pop. 65+	Median Age	% High School or Higher	% Occupied Housing Units, Renter Occupied	Median Year Housing Units Built	% Civ. Pop. 16+ in Labor Force	Unemploy. Rate	Per Capita Income ($)
Alabama	*35.4*	*34.8*	*1.1*	*18.4*	*39.3*	*87.7*	*30.3*	*1985*	*58.0*	*5.1*	*33,344*
Lawrence County	*23.7*	*37.5*	*0.6*	*18.6*	*42.7*	*82.7*	*20.6*	*1989*	*53.2*	*3.0*	*29,486*
CT 9791 BG 1	85.5	27.3	7.3	14.0	53.3	81.4	20.0	1991	64.0	3.4	32,994
CT 9791 BG 2	28.4	31.8	0.0	16.7	43.5	67.2	18.8	1994	68.9	0.0	30,883
CT 9792.01 BG 1[b]	55.9	52.8	0.0	15.3	33.6	80.5	18.5	1980	54.5	0.6	26,918
CT 9792.01 BG 2[a,b]	68.7	44.5	1.0	22.7	48.8	83.5	37.2	1979	40.9	6.8	24,181
CT 9792.02 BG 1	44.4	46.9	0.0	24.9	44.2	95.2	12.8	1982	38.5	2.2	21,432
Lauderdale County	*16.6*	*32.4*	*0.9*	*20.1*	*40.8*	*88.8*	*32.5*	*1979*	*58.1*	*3.6*	*32,678*
CT 118.02 BG 1	21.7	7.3	0.0	13.3	36.5	84.6	9.5	1997	59.2	3.9	45,428

Sources: USCB 2022a; USCB 2022c; USCB 2022g; USCB 2022h; USCB 2022i; USCB 2022j; USCB 2022k; USCB 2022l; USCB 2022m

[a] Project Site lies partially within CT 9791 BG 2 and CT 9792.01 BG 2.

[b] TL Upgrade Areas lie partially within CT 9792.01 BGs 1 and 2.

Table 3-40. EJ indices percentile comparisons to the state for the qualifying communities with EJ concerns

EJ Index	Lawrence County	CT 9791 BG 1	CT 9791 BG 2	CT 9792.01 BG 1[b]	CT 9792.01 BG 2[ab]	CT 9792.02 BG 1	Lauderdale County	CT 118.02 BG 1
$PM_{2.5}$	8	15	9	5	5	9	1	1
Ozone	**72**	**85**	**72**	**86**	**86**	**81**	**63**	30
NO_2	47	**69**	30	**73**	**52**	39	**60**	26
Diesel PM	45	**70**	**52**	**60**	**65**	**61**	**52**	21
Toxic Releases to Air	**69**	**90**	**76**	**88**	**90**	**82**	40	40
Traffic Proximity	33	**61**	42	**51**	**59**	**51**	**56**	15
Lead Paint	46	**58**	23	**65**	**72**	**70**	**54**	15
Superfund Proximity	0	0	0	0	0	0	0	0
RMP Facility Proximity	38	**84**	**72**	0	0	0	**60**	0
Hazardous Waste Proximity	31	**81**	**68**	0	0	0	**54**	0
Underground Storage Tanks	43	**55**	24	43	47	**55**	**54**	17
Wastewater Discharge	35	**86**	**72**	39	**67**	23	47	14
Drinking Water Non-Compliance	**66**	0	—	**90**	0	0	**65**	0

Source: USEPA 2024b
[a] Project Site lies partially within CT 9791 BG 2 and CT 9792.01 BG 2.
[b] TL Upgrade Areas lie partially within CT 9792.01 BGs 1 and 2.
Emboldened values represent above average pollution levels (above the 50th percentile).
"—" indicates that no data is available.

3.16.2 Environmental Consequences

3.16.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed and there would be no changes to the Project area attributable to the Proposed Action; therefore, no disproportionate and adverse impacts on low-income or minority populations would occur.

3.16.2.2 Proposed Action Alternative

3.16.2.2.1 Project Site

The Project Site overlaps two BGs that are qualifying communities with EJ concerns. CT 9792.01 BG 2 qualifies as a low-income and minority community with EJ concerns based on surpassing the thresholds for percent of households below poverty level, poverty ratio, per capita income, and percent of minorities. CT 9791 BG 2 qualifies as a minority community with EJ concerns based on surpassing the threshold for percent of minorities. The Project Site is within one mile of two additional BGs that are qualifying communities with EJ concerns. CT 9791 BG 1 qualifies as a minority and LEP community with EJ concerns based on surpassing the thresholds for percent of minorities and LEP language groups. CT 9792.02 BG 1 qualifies as a low-income and minority community with EJ concerns based on surpassing the thresholds for percent of households below poverty level, poverty ratio, per capita income, and percent of minorities.

3.16.2.2.1.1 Construction-related Impacts to Communities with EJ Concerns

During construction, communities with EJ concerns would experience temporary and minor impacts to the ambient noise environment in the Project area. Several residences, churches, businesses, industrial buildings, and agricultural buildings would experience heightened noise during construction, primarily from pile-driving activities. Pile-driving for installation of PV arrays would occur over a six-to-12-month period. Construction would primarily occur during daylight hours, between sunrise and sunset, for five to seven days a week; therefore, the Project would not affect ambient noise levels at night during most of the construction period. Pile-driving within 5,000 feet of residences and churches would be scheduled during daylight hours Monday through Friday and occasionally on Saturdays when the schedule requires and outside of church services to minimize impacts to the residences and churches.

Construction related short-term adverse impacts to utilities, including installation of a service drop to provide construction power and potential planned electrical service outages, could occur when bringing the solar facility online. JWEMC would coordinate with customers if outages were necessary.

Transportation effects associated with construction activities would be concentrated on public roads in the immediate vicinity of the Project Site. Due to an increase in construction and worker traffic, there could be a temporary, moderate increase in traffic that is not likely to increase the risk to the public. Therefore, there would be minor, temporary effects related to increased traffic and driver safety. Use of mitigation measures, such as posting a flag person during heavy commute periods to manage traffic flow, prioritizing access for local residents, and implementing staggered work shifts during daylight hours, would minimize potential adverse impacts to traffic to minor levels.

3.16.2.2.1.2 Operation- and Maintenance-related Impacts to Communities with EJ Concerns

The most noticeable long-term impacts to communities with EJ concerns would be changes to visual resources and conversion of land use from agricultural land to industrial. Visual effects of the built facility would likely be moderate due to, in many instances, the unobstructed visibility of portions of the facility components.

The development of the solar facility would result in the long-term change in land use from primarily agricultural land dominated by cultivated crops to primarily industrial. Since the agricultural industry is not one of the top industries in the Project area, few people would be adversely affected economically by having less crop production in this area during the existence of this facility.

3.16.2.2.2 TL Upgrade Areas

The TL Upgrade Areas overlap two BGs that are qualifying communities with EJ concerns. CT 9792.01 BG 1 qualifies as a low-income and minority community with EJ concerns based on surpassing the thresholds for poverty ratio, per capita income, and percent of minorities. CT 9792.01 BG 2 qualifies as a low-income and minority community with EJ concerns based on surpassing the thresholds for percent of households below poverty level, poverty ratio, per capita income, and percent of minorities. The TL Upgrade Areas are within one mile of two additional BGs that are qualifying communities with EJ concerns. CT 9791 BG 2 and CT 118.02 BG 1 qualify as minority communities with EJ concerns based on surpassing the threshold for percent of minorities.

3.16.2.2.2.1 Construction-related Impacts to Communities with EJ Concerns

Noise-sensitive receptors near the TL Upgrade Areas would temporarily experience heightened noise during daylight hours primarily during pole drilling for the installation of four TL pole structures and the installation of OPGW by helicopter. Pole drilling activities and the installation of OPGW by helicopter would result in temporary, adverse noise effects.

The Project-related TL upgrade activities may result in short-term adverse impacts to local utilities such as electrical service due to brief outages. The additional electric system modifications to existing TVA substations may require a temporary electric service outage of L5832 and L5669, lasting a minimum of a few days. If outages on these or other TLs are required, TVA would work with JWEMC to provide alternative means of providing electrical service to the area to avoid service interruptions. TVA would also try to perform these outages at low-impact times, such as overnight, to maintain power service to JWEMC. If required, these potential outages would be dispersed over a relatively large area that the TL serves which could not be routed around. Therefore, impacts to the communities with EJ concerns would not be disproportionate, despite being adverse.

3.16.2.2.2.2 Operation- and Maintenance-related Impacts to Communities with EJ Concerns

The operation and maintenance of L5832 and L5669 is not anticipated to have any impacts to communities with EJ concerns.

3.16.2.2.3 Consideration of Existing Environmental Indicators

EJScreen data showed increased levels of pollutants of concern in most of the EJ-qualifying BGs in the area; therefore, these groups may be at risk for disproportionate and cumulative negative health impacts. Project activities likely would not further increase those values but could result in amplified cumulative impacts to communities with EJ concerns as a result of pre-existing environmental contaminants; however, these are expected to be mitigated through the application of BMPs.

In Lawrence County, all five of the EJ-qualifying BGs indicated ozone, diesel PM, and toxic releases to air; four of the EJ-qualifying BGs indicated traffic proximity; and three of the EJ-qualifying BGs indicated NO_2 above the 50th percentile in comparison with the state. Most potential air quality impacts associated with the Proposed Action would occur during construction. Construction activities would create emissions from construction equipment and vehicles, contracted employees' personal vehicles, and fugitive dust suspension from clearing, grading, and other activities. Through the employment of appropriate permits and BMPs, these activities are not expected to have any health consequences. Combustion of gasoline and diesel fuels by internal combustion engines (haul trucks and off-road vehicles) would generate local emissions of PM, NO_x, CO, volatile organic compounds, and SO_2. The total amount of these emissions would be small and, overall, would result in negligible air quality impacts.

Two of the EJ-qualifying BGs indicated RMP facility proximity and hazardous waste proximity above the 50th percentile in comparison with the state. A SPCC plan would be prepared prior to construction to prevent oil discharges during facility operations. During operations, bulk chemicals would be stored in storage tanks and other chemicals would be stored in returnable delivery containers. Chemical storage areas would be designed to contain leaks and spills. The transport, storage, handling, and use of chemicals would be conducted in accordance with applicable laws, ordinances, regulations, and standards. Waste collection and disposal would be conducted in accordance with applicable regulatory requirements to minimize health and safety effects. If necessary, Hillsboro Solar, LLC or the construction contractor would obtain a hazardous waste generator identification number from USEPA and the State of Alabama prior to generating any hazardous waste. Any adverse impacts due to hazardous waste are anticipated to be minor and temporary through the development and implementation of plans and programs to ensure safe handling, storage, and use of hazardous materials, described in Section 3.12.

Three of the EJ-qualifying BGs indicated wastewater discharge above the 50th percentile in comparison with the state. Wastewater potentially generated during construction or operations may include domestic sewage and wastewater from non-detergent equipment washing and dust control. Portable toilets or other temporary facilities would be used for the construction workforce. Water used for equipment washing and dust control would be handled in accordance with BMPs described in the CBMPP. With application of these BMPs, no adverse effects would be anticipated from wastewater generated during the Project; and communities with EJ concerns would not experience disproportionate effects.

3.16.2.3 Cumulative Impacts

Based on the analysis conducted, impacts resulting from construction of the Proposed Action Alternative would result in minor disproportionate and adverse impacts to communities with EJ concerns in the Project area. The development of the adjacent North Alabama Utility-Scale Solar Facility would similarly introduce up to 500 workers for approximately 24–36 months during construction. Nearby towns and cities provide sufficient infrastructure and resources to support the influx of workers during the construction period. Together with the Proposed Action, up to 1,000 workers could contribute to cumulative impacts to communities with EJ concerns during construction primarily due to increased noise, air pollutant and GHG emissions, and traffic, depending on the timing of that project. As with the past, present, and RFFAs, the Project would consider impacts to communities with EJ concerns within the Project boundaries and surrounding area. With proper planning, community input, and aligning goals with community desires, adverse cumulative impacts from the Project in relation to EJ would be mitigated. Beneficial socioeconomic cumulative impacts are anticipated for communities with EJ concerns due to the RFFAs and the Proposed Action increasing local employment during construction and operation of the facilities.

3.17 Unavoidable Adverse Environmental Impacts

The Proposed Action could cause some unavoidable adverse environmental impacts. Specifically, construction activities would temporarily increase noise, traffic, and health and safety risks and temporarily affect air quality, GHG emissions, and visual aesthetics in the Project Site vicinity. Construction activities would primarily be limited to daytime hours, which would minimize noise impacts. Temporary increases in traffic would be minimized or mitigated by instituting staggered work shifts during daylight hours. Temporary increases in health and safety risks would be minimized by implementation of the Project health and safety plan. Construction and operations would have minor, localized effects on soil erosion and sedimentation that would be minimized by soil stabilization and vegetation management measures. The Project would result in minor, temporary direct impacts to land use during construction and moderate, long-term direct impacts to land use during operation due to the loss of crop production because of the conversion of 2,846 acres of the Project Site from primarily agricultural land dominated by cultivated crops to industrial and forest. A long-term adverse effect to forest-dependent wildlife would result from the clearing of 95 acres of trees on the Project Site. However, eventual reforestation of the 1,348 acres of cropland on the Project Site that would not be developed would result in a large increase in plant diversity, resulting in a moderate beneficial impact. The Project is not likely to adversely affect any federally listed species and would have minimal to negligible impacts to state-listed species of conservation concern. In compliance with Section 7 of the ESA, TVA is consulting with USFWS on potential effects of the Proposed Action on federally listed bat species and final correspondence will be included with the final EIS.

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

Short-term uses are those that generally occur on a year-to-year basis. Examples are wildlife use of forage, timber management, recreation, and uses of water resources. Long-term productivity is the capability of the land to provide resources, both market and nonmarket, for future generations. In this context, long-term impacts to site productivity would be those that last beyond the life of the Project. The Proposed Action would adversely affect current short- and long-term uses of the Project Site by converting it from agricultural and undeveloped land to a solar power generation facility. The effects on long-term productivity would be minimal as existing land uses could be readily restored on the Project Site following the decommissioning and removal of the solar facility. See Section 2.2.4 for additional information on the decommissioning process.

3.19 Irreversible and Irretrievable Commitments of Federal Resources

An irreversible or irretrievable commitment of resources would occur when resources would be consumed, committed, or lost because of the Project. The commitment of a resource would be considered irretrievable when the Project would directly eliminate the resource, its productivity, or its utility for the life of the Project and possibly beyond. Construction and operation activities would result in an irretrievable and irreversible commitment of natural and physical resources. The implementation of the Proposed Action Alternative would involve irreversible commitment of fuel and resource labor required for the construction, maintenance, and operation of the solar facility. Because removal of the solar arrays and associated on-site infrastructure could be accomplished rather easily, and the facility would not irreversibly alter the site, the Project Site could be returned to its original condition or used for other productive purposes once it is decommissioned. Most of the solar facility components could also be recycled after the facility is decommissioned. Federal resources committed during the construction and operation of the Project would consist of the land and components associated with the Hillsboro III Solar substation, Brides Hill switching station, and Project-specific TL upgrades. These facilities typically have a long operational life and some of them could continue operating after the solar facility is decommissioned. See Section 2.2.4 for additional information on the decommissioning process.

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4.1.1 TVA Project Management

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4.2.1 TVA Contributors

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Appendix A – Water Resources-Related Supporting Information

Aquatic Ecology and Wetlands Assessment

Urban Grid Hillsboro Solar Project

Lawrence County, Alabama

July 12, 2024

Contents

Tables

Appendices

List of Acronyms and Abbreviations

AC	alternating current
ADEM	Alabama Department of Environmental Management
BMP	Best Management Practices
CWA	Clean Water Act
DWR	TDEC Division of Water Resources
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HD	Hydrologic Determination
HUC	Hydrologic Unit Code
kV	kilovolt
MW	megawatt
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NRCS	National Resources Conservation Service
NWI	National Wetland Inventory
NWP	Nationwide Permit
OHWM	Ordinary High-Water Mark
PEM	Palustrine emergent
PFO	Palustrine forested
Project	Hillsboro Solar Project
PSS	Palustrine scrub shrub
PUBH	Palustrine, unconsolidated bottom, permanently flooded
PWS	Professional Wetland Scientist
ROW	Right(s)-of-way
RPW	Relatively Permanent Water
SFHA	Special Flood Hazard Areas
SMZ	Streamside Management Zone
Study Area	Hillsboro Solar Study Area
TDEC	Tennessee Department of Environment & Conservation
TL	Transmission line
TN-QHP-IT	Tennessee Qualified Hydrologic Professional in Training
TVA	Tennessee Valley Authority
TVARAM	TVA Rapid Assessment Method
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. Geologic Survey
WOTUS	Waters of the U.S.
WQC	Water Quality Certification
WWC	Wet Weather Conveyance

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1 Introduction and Scope of Work

On behalf of Urban Grid, HDR Engineering, Inc. (HDR) conducted a wetlands delineation for a proposed solar photovoltaic facility known as Hillsboro Solar to be built in Lawrence County, Alabama (Project). Hillsboro Solar would be constructed within a Project Site of approximately 3,779 acres to develop the 200-megawatt alternating current solar facility. The Project Site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro (**Appendix A**, **Figure 1**). Hillsboro Solar would sell power to Tennessee Vally Authority (TVA) and would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which extends through the Project Site. TVA would modify approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL and may also improve associated access routes (TL Upgrade Areas). Together, the Project Site (3,779 acres) and the TL Upgrade Areas (145 acres) total 3,924 acres and are referred to herein as the Study Area

Wetlands are protected under Sections 404 and 401 of the Clean Water Act (CWA) and by Executive Order 11990 - Protection of Wetlands. The goal of the field delineation is to identify surface water and wetland resources within the Study Area likely to be considered jurisdictional by the U.S. Army Corps of Engineers (USACE) under Section 404 of CWA, which defines jurisdictional waters to include navigable waters, the perennial, intermittent, and ephemeral tributaries of truly navigable waters, and adjacent wetlands. The 1987 USACE Wetland Delineation Manual defines wetlands as areas that have positive indicators for hydrophytic vegetation, wetland hydrology, and hydric soils or as “areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions,” with special exceptions.

In accordance with TVA’s *Guidelines for Conducting Biological and Cultural Surveys and Impact Analyses* (TVA 2023), which are intended to prescribe the content of wetland reports for use in analysis and preparation of National Environmental Policy Act (NEPA) documents, HDR conducted field surveys to identify surface water and wetland resources within the Study Area, determine potential impacts, and recommend suitable mitigation measures. The results of this assessment are presented herein. Attached to this report are supporting figures (**Appendix A**); field data forms (USACE wetland data forms, TVA Rapid Assessment Method [TVARAM] forms, and Tennessee Department of Environment and Conservation [TDEC] Division of Water Resources forms) and Hydrologic Determination Field Data Sheets (**Appendix B**); and site photographs (**Appendix C**).

1.1 Study Area Location

The Project site is located just northwest of the Town of Hillsboro and approximately four miles south of Wheeler Reservoir (Tennessee River) in Lawrence County, Alabama (site coordinates are 34.665266°, -87.241323°). The TL Upgrade Areas extend from the Project site in a northwest direction to Wheeler Reservoir (from 34.679624°, -87.257913° to 34.795843°, -87.382893°). Study Area vicinity and topographic maps are included in **Appendix A, Figure 1** and **Figure 4**.

1.2 Study Area Description

The Study Area is situated in the Eastern Highland Rim ecoregion, which is part of the larger Level III Interior Plateau Ecoregion of Alabama (Level III; Griffith et al. 2001) and is within four different United States Geological Survey (USGS) Hydrologic Unit Code (HUC) 12 watersheds. These watersheds are McKieman Creek-Tennessee River (060300050801), Lower Big Nance Creek (060300050105), Red Branch-Spring Creek (060300021201), and Dry Creek-Mallard Creek (060300021106) (**Appendix A, Figure 3**).

1.2.1 Geology, Topography, and Land Use

Typical vegetation within this ecoregion includes oak-hickory forest, with some mixed mesophytic forest and areas of cedar glades. The area typically has deep, well-drained, reddish soils that are intensively farmed. Landforms in the region consist of limestone, chert, sandstone, siltstone, and shale. In addition, this region is characterized by caves, springs, and sinks (U.S. Environmental Protection Agency [USEPA] 2001).

The Project site predominantly consists of agricultural fields used for cotton, soybean, and corn production, and forested areas. Most forested stands are located on the eastern half of the Project site. The terrain is characterized as gently sloping, with elevations ranging from approximately 570 feet to 620 feet above mean sea level.

The TL Upgrade Area predominantly consists of agricultural fields used for soybean and corn production, open pasture, and maintained TVA rights-of-way (ROW). The terrain is characterized as gently sloping, with elevations ranging from approximately 550 feet to 590 feet above mean sea level (**Appendix A**, **Figure 4**).

1.2.2 Soils

According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey for Lawrence County, Alabama, 38 soil types are found within the Study Area (NRCS 2023). Approximately 15.9 percent of the Study Area is identified as predominantly hydric, while 11.8 percent is predominantly non-hydric. The remaining is considered non-hydric (**Appendix A, Figure 5**). **Table 1** presents a summary of soils within the Study Area.

Table 1 Summary of USDA NRCS Soils within the Study Area

Map Unit Symbol	Map Unit Name	Farmland Classification	Hydric	Acres of Study Area	Percent of Study Area
Aa	Abernathy-Emory fine sandy loams, 0 to 2 percent slopes	Prime farmland	Non-hydric	14.31	0.36
Ab	Abernathy fine sandy loam, undulating phase	Prime farmland	Predominately non-hydric	2.72	0.07
Ac	Abernathy-Emory silt	Prime farmland	Non-hydric	560.37	14.28

Map Unit Symbol	Map Unit Name	Farmland Classification	Hydric	Acres of Study Area	Percent of Study Area
	loams, 0 to 2 percent slopes				
Ad	Emory-Abernathy silt loams, 0 to 6 percent slopes	Prime farmland	Non-hydric	48.77	1.24
Af	Allen fine sandy loam, eroded, hilly phase	Not prime farmland	Predominately non-hydric	1.71	0.04
Bb	Baxter (Fullerton) gravelly silt loam, 6 to 12 percent slopes, eroded	Farmland of statewide importance	Non-hydric	48.09	1.23
Bc	Baxter cherty silt loam, hilly phase	Not prime farmland	Predominately non-hydric	2.16	0.05
Cu	Cumberland loam, 6 to 12 percent slopes, eroded	Prime farmland	Non-hydric	2.91	0.07
Cv	Cumberland loam, 2 to 6 percent slopes, eroded	Prime farmland	Non-hydric	663.08	16.90
Cw	Cumberland loam, 2 to 6 percent slopes	Prime farmland	Non-hydric	7.64	0.19
Da	Decatur silt loam, 2 to 6 percent slopes	Prime farmland	Non-hydric	3.82	0.10
Db	Decatur silty clay loam, 6 to 12 percent slopes, eroded	Farmland of statewide importance	Non-hydric	9.13	0.23
Dc	Decatur silty clay loam, 2 to 6 percent slopes, eroded	Prime farmland	Non-hydric	1,035.62	26.39
Dd	Decatur silty clay, 6 to 12 percent slopes, gullied	Farmland of statewide importance	Non-hydric	16.98	0.43
De	Decatur silty clay, 6 to 10 percent slopes, severely eroded	Not prime farmland	Non-hydric	326.12	8.31
Df	Decatur silty clay, 2 to 6 percent slopes,	Farmland of statewide importance	Non-hydric	135.83	3.46

Map Unit Symbol	Map Unit Name	Farmland Classification	Hydric	Acres of Study Area	Percent of Study Area
	severely eroded				
Dg	Dewey cherty silty clay loam, eroded, rolling phase	Farmland of statewide importance	Predominately non-hydric	23.15	0.59
Dh	Dewey cherty silty clay loam, eroded, undulating phase	Prime farmland	Predominately non-hydric	4.55	0.12
Ed	Etowah loam, eroded, undulating phase	Prime farmland	Predominately non-hydric	57.06	1.45
Ee	Etowah loam, undulating phase	Prime farmland	Predominately non-hydric	58.96	1.50
Ef	Etowah silt loam, undulating phase	Prime farmland	Predominately non-hydric	6.03	0.15
Eg	Etowah silty clay loam, 6 to 12 percent slopes, eroded	Not prime farmland	Non-hydric	12.56	0.32
Eh	Etowah silty clay loam, 2 to 6 percent slopes, eroded	Prime farmland	Non-hydric	4.25	0.11
Hf	Monongahela and Holston fine sandy loams, eroded, undulating phase	Prime farmland	Predominately non-hydric	10.68	0.27
Hh	Monongahela and Holston fine sandy loams, undulating phase	Prime farmland	Predominately non-hydric	50.37	1.28
Lb	Lindside silty clay loam	Prime farmland	Predominately non-hydric	49.22	1.25
Ma	Melvin silt loam	Not prime farmland	Predominantly hydric	25.96	0.66
Mb	Tyler and Monongahela fine sandy loams, eroded, undulating phase	Prime farmland	Predominately non-hydric	24.02	0.61
Mc	Tyler and Monongahela fine sandy loams, level phases	Prime farmland	Predominately non-hydric	52.69	1.34
Md	Tyler and Monongahela fine sandy	Prime farmland	Predominately non-hydric	3.07	0.08

Map Unit Symbol	Map Unit Name	Farmland Classification	Hydric	Acres of Study Area	Percent of Study Area
	loams, undulating phase				
Oa	Ooltewah fine sandy loam	Farmland of statewide importance	Predominantly hydric	37.04	0.94
Ob	Ooltewah silt loam	Farmland of statewide importance	Predominantly hydric	212.19	5.41
Ph	Prader silt loam	Not prime farmland	Predominantly hydric	1.64	0.04
Ra	Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded	Farmland of statewide importance	Predominantly hydric	341.24	8.70
Sa	Sequatchie fine sandy loam, eroded, undulating phase	Prime farmland	Predominately non-hydric	0.47	0.01
Sb	Sequatchie fine sandy loam, undulating phase	Prime farmland	Predominately non-hydric	1.33	0.03
To	Tupelo silt loam	Farmland of statewide importance	Predominately non-hydric	62.32	1.59
Tp	Tyler fine sandy loam	Prime farmland	Predominately non-hydric	1.49	0.04
Ud	Udorthents	Not prime farmland	Non-hydric	0.01	0.00
Wa	Waynesboro clay loam, severely eroded, rolling phase	Farmland of statewide importance	Predominately non-hydric	0.28	0.01

1.2.3 Floodplains

A review of Federal Emergency Management Agency (FEMA) National Flood Hazard FIRM Panel Nos. 01079C0120D, 01079C0140D, and 01079C0139D indicated that Special Flood Hazard Areas (SFHA) extend into the Study Area associated with Spring Creek and Wheeler Branch (FEMA 2023) (**Appendix A, Figure 6**). The SFHA are classified by FEMA as high-risk flood (AE) zones and are subject to inundation by the one-percent-annual-chance flood event being equaled or exceeded in any given year (i.e., 100-year flood) (FEMA 2020). Project development activities within the SFHA may require FEMA compliance as well as compliance with Executive Order 11988 (FEMA 2021).

1.2.4 CWA Section 303(d) Impaired Waters

HDR reviewed the Alabama Department of Environmental Management (ADEM) Impaired Waters §303(d) list (ADEM 2022a) and the Water Quality Layers 2022 map (ADEM 2022b) accessible online for records of impaired waters within the Study Area. Impaired Waters are defined as surface waters including segments of rivers, streams, lakes, reservoirs, and estuaries that do not fully support their currently designated use or uses (ADEM 2022c). The query found that a portion of Spring Creek, located approximately 100 feet from the proposed solar site, was listed as an impaired water on the 2020 Impaired Waters §303(d) list. Spring Creek was erroneously added to the 2016 list; however, it was delisted and removed from the ADEM 2022 list. There were no other records of §303(d) impaired waters within the Study Area.

2 Preliminary Wetland Review

2.1 Desktop Review

Prior to conducting field investigations, HDR environmental scientists reviewed available background information including:

- Aerial imagery via ESRI and Google Earth software (**Appendix A, Figure 2**),
- USGS HUC watersheds (**Appendix A, Figure 3**),
- USGS 7.5-minute quadrangle map (**Appendix A, Figure 4**),
- USDA NRCS Web Soil Survey (**Appendix A, Figure 5**),
- USGS National Hydrography Dataset (NHD) mapped streams (**Appendix A, Figure 6**), and
- U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI) mapped wetlands (**Appendix A, Figure 6**)
- FEMA floodplains (**Appendix A, Figure 6**)

2.2 Qualifications

HDR surveys were conducted by environmental scientists Lyranda Thiem (Tennessee Qualified Hydrologic Professional in Training [TN-QHP-IT]), Johanna Velasquez, Ethan Lawton, Rebekkah Riley (TN-QHP-IT), Paul Bright (TN-QHP-IT), Michael Inman, Jake Irvin (Professional Wetland Scientist [(PWS]), and Benjamin Burdette (TN-QHP). Surveys were carried out by HDR scientists with advanced degrees, training, and experience in accurate identification and assessment of wetland and upland vegetation species, soil profile and morphology, and hydrologic indicators influencing wetland occurrence. HDR staff also have experience in federal, state, and local wetland regulatory compliance obligations and NEPA process, as well as mitigation measures.

3 Waters and Wetlands Determination Methods

In December 2021, Urban Grid contracted AECOM to perform a survey of wetlands, streams, and other water bodies on the proposed Project site regulated under Section 404 of the CWA. The survey covered approximately 2,600 acres of the Project site. AECOM-delineated features are depicted on **Appendix A, Figure 7**.

On August 8th – 11th, August 14th – 15th, and October 9th – 11th, 2023, field surveys were conducted by HDR environmental staff to identify potential jurisdictional waters of the U.S. (WOTUS) within the Project. Initial field survey activities investigated a 3,960-acre site that extended beyond the limits of the current Study Area discussed herein. Preliminary design efforts for the Project aiming at avoiding and minimizing impacts reduced the Project site to 3,779 and thus the Study Area to 3,924 acres.

HDR's survey efforts also field-verified previously delineated wetlands, streams, and other water bodies delineated in 2021 by AECOM.

WOTUS were delineated according to the methodology and guidance described in USACE 1987 *Wetland Delineation Manual* (USACE 1987), USACE Post-Sackett Ruling (USACE 2023), and the USACE *Eastern Mountains and Piedmont Region (Version 2.0)* (Regional Supplement) (USACE 2012). Wetland features were classified according to the Cowardian naming convention (Cowardin et al. 1979). Streams were classified according to the guidance outlined in USACE Regulatory Guidance Letter 05-05 – Ordinary High-Water Mark (OHWM) Identification (USACE 2005) and the TDEC *Guidance for Making Hydrologic Determinations (Version 1.5)* (TDEC 2020). Jurisdictional WOTUS were flagged in the field and ESRI Field Maps was employed to map their boundaries with a mobile device. The mobile device's integrated GPS antenna was used to collect appropriate feature data in the field with sub-meter accuracy. Geographic Information System (GIS) software was used to analyze collected features, calculate areas, and generate figures. All point, line, and polygon data collected using the GPS receiver and displayed on figures provided in **Appendix A** are for review purposes only and do not represent a professional civil survey.

The TVARAM was used to determine the condition of each wetland at the time of assessment (TDEC 2019). This method produces a quantitative score on a scale of 1 – 100 that represents the relative condition of a wetland. Range and quality of categories are as follows:

0 – 29 = Category 1, low wetland function, condition, quality
30 – 59 = Category 2, good/moderate wetland function, condition, quality
60 – 100 = Category 3, superior wetland function, condition, quality

The USACE has the regulatory authority to issue preliminary and/or approved jurisdictional determinations based on the regulations in place at the time of their assessment. Therefore, the potential jurisdictional status of water bodies identified in this delineation and proposed jurisdictional determination reflect that of the Post-Sackett Ruling.

The determinations within this report are subject to review and approval by the USACE Nashville Regulatory District, and the final jurisdictional determinations are within the regulatory authority of the USACE and USEPA. Additionally, water bodies may be regulated by the ADEM Water Division and subject to Section 401 of the CWA.

4 Waters and Wetlands Descriptions

4.1 Streams

4.1.1 Relatively Permanent Waters with Perennial Flow

Streams S003, S004, S006, S008, S009, and S011 were identified as Relatively Permanent Waters (RPWs) that exhibit perennial surface water flow (**Appendix A, Figure 7**) (**Table 2**). S006 is Spring Creek and S008 is Wheeler Branch. According to the Cowardian Classification hierarchical structure (Cowardian et al. 1979), S003, S004, S009, and S011 are classified as riverine, unknown perennial features with an unconsolidated mud bottom (R5UB3), while S006 and S008 are riverine, upper perennial features with unconsolidated sand bottoms (R3UB2). OHWM indicators observed during the field assessment include a well-defined natural line impressed on the bank, shelving, absence of vegetation, disturbed and/or washed away leaf litter, sediment deposition, sediment sorting, and scour.

S003 and S004 are perennial streams found in the north-central portion of the Project site and flow into W006.

S006 (Spring Creek) is a perennial stream in the central portion of the Project site. S006 flows south to north through W008 and off-site to Swoop Pond.

S008 (Wheeler Branch) is a perennial stream in the central portion of the Project site that flows south to north and off-site. In the fall of 2023 and the spring of 2024, TVA aquatic biologists conducted stream sampling for rare aquatic fauna within the Project site. Two state-listed aquatic species were identified within S008 (Wheeler Branch): the Tuscumbia darter (*Etheostoma tuscumbia*), and round-rib elimia (*Elimia nassula*).

S009 is a perennial stream found in the north-central portion of the Project site west of County Road 420. S009 flows west into S008.

S011 is a perennial stream located in the central portion of the Project site south of County Road 387. S011 drains W017 and connects to S008 off-site.

4.1.2 Relatively Permanent Waters with Seasonal Flow

S001, S002, S005, S007, S010, and S012 were identified as RPWs that exhibit continuous seasonal surface flow to other RPWs on and off-site (**Appendix A, Figure 7**). According to the Cowardin Classification hierarchical structure (Cowardin et al. 1979), these streams are classified as riverine, intermittent features with mud bottom streambeds (R4SB5) (**Table 2**). OHWM indicators observed during the field assessment include a well-defined natural line impressed on the bank, disturbed or washed away leaf litter, absence of vegetation, sediment deposition, and scour.

Streams exhibiting RPW flow are briefly described below. All features are shown on **Figures 7.1 – 7.19** in **Appendix A**.

S001, S002, and S005 are intermittent streams found in the north-central portion of the Project site and flow into W006.

S007 is an intermittent stream found in the central portion of the Project site that flows into S006.

S010 is an intermittent stream found in the north-central portion of the Project site west of County Road 420. S010 drains W015 and flows into S009.

S012 is an intermittent stream found in the northwest portion of the TL Upgrade Area.

Table 2 Summary of Delineated Streams

Feature Identifier	Flow Regime	Cowardin Code[1]	TDEC HD Determination (Score)	Streamside Management Zone Category[2]	Latitude	Longitude	Presumed Jurisdiction		Linear Feet within Study Area
							Section 404	Section 401	
S001	Intermittent	R4SB5	Stream (22.5)	A	34.677254	-87.263872	Yes	Yes	376
S002	Intermittent	R4SB5	Stream (19)	A	34.677025	-87.263770	Yes	Yes	140
S003	Perennial	R5UB3	Stream (30)	A	34.677331	-87.262667	Yes	Yes	404
S004	Perennial	R5UB3	Stream (30)	A	34.677289	-87.261201	Yes	Yes	235
S005	Intermittent	R4SB5	Stream (27.5)	A	34.677163	-87.261350	Yes	Yes	154
S006	Perennial	R3UB2	Stream (36)	A	34.681058	-87.257495	Yes	Yes	2,436
S007	Intermittent	R4SB5	Stream (19)	A	34.674747	-87.253275	Yes	Yes	161
S008	Perennial	R3UB2	Stream (43.5)	B	34.666782	34.666782	Yes	Yes	5,541
S009	Perennial	R5UB3	Stream (35)	A	34.684110	-87.240742	Yes	Yes	256
S010	Intermittent	R4SB5	Stream (25)	A	34.683454	34.683454	Yes	Yes	510
S011	Perennial	R5UB3	Stream (30)	A	34.67029	-87.242739	Yes	Yes	45
S012	Intermittent	R4SB5	Stream (19)	A	34.677254	-87.263872	Yes	Yes	145
						Streams Total:			**10,403**

1. R3UB2: Riverine, upper perennial, unconsolidated bottom, sand.
   R4SB5: Riverine, intermittent, streambed, mud.
   R5UB3: Riverine, unknown perennial, unconsolidated bottom, mud.
2. A = Requires a 50-foot undisturbed natural buffer.
   B = Requires a 70-foot undisturbed natural buffer.

4.2 Wetlands

4.2.1 Emergent Wetlands

Many of the wetlands in the Study Area are within agricultural lands and are heavily impacted by agricultural practices and runoff. Emergent wetlands total approximately 17 acres and include wetlands W002b, W002c, W005a, W005c, W007, W009, W010, W027b, W030a, and W034 through W037 (**Appendix A, Figure 7**) (**Table 3**). These wetlands were identified as palustrine, emergent, persistent, (PEM1) (Cowardin et al. 1979) and are dominated by herb species consisting of bladder sedge (*Carex intumescens*), water purslane (*Ludwigia palustris*), spotted water hemlock (*Cicuta maculata*), buttonbush (*Cephalanthus occidentalis*), trumpet vine (*Campsis radicans*), barnyard grass (*Echinochloa crus-galli*), and blunt brown sedge (*Carex tribuloides*).

W002b and W002c are PEM wetlands located in an agricultural field. Primary and secondary wetland hydrology indicators at these wetlands include sediment deposits, drainage patterns, and geomorphic position. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. Vegetation found in the herb stratum of these wetlands includes bladder sedge, water purslane, common cocklebur (*Xanthium strumarium*), trumpet vine, and common sneezeweed (*Helenium autumnale*). The TVARAM score for both W002b and W002c is 61, ranking them as superior resource value wetlands.

W005a is an isolated PEM wetland in a soybean field. Primary and secondary wetland hydrology indicators at W005a include surface water, high water table, saturation, water marks, aquatic fauna, recent iron reduction in tilled soils, drainage patterns, and saturation visible on aerial imagery. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. Vegetation found in the herb stratum includes water purslane, Pennsylvania smartweed (*Persicaria pensylvanic),* blunt spikerush (*Eleocharis obtuse*), and soybean (*Glycine max*). The TVARAM score for W005a is 36, ranking it a moderate resource value wetland.

W005c is a PEM wetland connected to W005b. Primary and secondary wetland hydrology indicators at W005c include surface water, high water table, saturation, water marks, and drainage patterns. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. Vegetation found in the herb stratum includes water purslane, common rush (*Juncus effusus*), and Carex sp. The TVARAM score for W005c is 36, ranking it a moderate resource value wetland.

W007 is a PEM wetland located in a transmission ROW. Primary and secondary wetland hydrology indicators at W007 include high water table, saturation, water marks, aquatic fauna, drainage patterns, saturation visible on aerial imagery, and geomorphic position. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. Vegetation found in W007 includes buttonbush (*Cephalanthus occidentalis*), Pennsylvania smartweed, blunt spikerush, and Georgia bulrush (*Scirpus georgianus*). The TVARAM score for W007 is 62, ranking it a superior resource value wetland.

W009 and W010 are isolated PEM wetlands located in a corn field. Primary and secondary wetland hydrology indicators include surface water, water marks, drainage patterns, saturation visible on aerial imagery, and geomorphic position. Agricultural practices have resulted from excessive erosional runoff; thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Vegetation found in the herb stratum includes barnyard grass (*Echinochloa crus-galli*) and scarlet toothcup (*Ammannia coccinea*). The TVARAM score for both W009 and W010 is 37, ranking them as moderate resource value wetlands.

W027b is an isolated PEM wetland in an agricultural field. Primary and secondary wetland hydrology indicators at W027b include surface water, high water table, saturation, water marks, drainage patterns, and saturation visible on aerial imagery. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. Vegetation found in the herb stratum includes barnyard grass and scarlet toothcup. The TVARAM score for W027b is 20, ranking it a low resource value wetland.

W030a is a PEM wetland connected to W030b. Primary and secondary wetland hydrology indicators at W030a include surface water, high water table, saturation, water marks, and drainage patterns. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. The TVARAM score for W030a is 47, ranking it a moderate resource value wetland.

W034 is a PEM wetland located in the northwest portion of the TL Upgrade Area. Primary and secondary wetland hydrology indicators at W034 include oxidized rhizospheres on living roots, drainage patterns, and geomorphic position. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. Vegetation found in W034 includes water smartweed (*Polygonum hydropiperoides*), common rush, marsh dewflower (*Murdannia keisak*), and littleleaf buttercup (*Ranunculus abortivus*). The TVARAM score for W034 is 21, ranking it a low resource value wetland.

W035 is an isolated PEM wetland located in the northwest portion of the TL Upgrade Area. Secondary wetland hydrology indicators include geomorphic position and microtopographic relief. Agricultural practices have resulted from excessive erosional runoff; thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Vegetation found in the herb stratum includes whitegrass (*Leersia virginica*), Carolina foxtail (*Alopecurus carolinianus*), and Japanese stiltgrass (*Microstegium vimineum*). The TVARAM score for W035 is 18, ranking it a low resource value wetland.

W036 is a PEM wetland located in the southeast portion of the TL Upgrade Area. Secondary wetland hydrology indicators include oxidized rhizospheres on living roots, geomorphic position, and microtopographic relief. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile and prominent redoximorphic concentrations. Vegetation found in the herb stratum includes broadleaf cattail (*Typha latifolia*), shallow sedge (*Carex lurida*), and Pennsylvania smartweed. The TVARAM score for W036 is 43, ranking it a moderate resource value wetland.

W037 is a non-jurisdictional isolated PEM wetland located in the southeast portion of the TL Upgrade Area. Secondary wetland hydrology indicators include microtopographic relief. Soils within this wetland exhibit matrix colors with a chroma equal to or greater than 4; therefore, hydric soils are not present. Vegetation found in the herb stratum includes Carolina foxtail and Chinese bushclover (*Lespedeza cuneata*). The TVARAM score for W037 is 11, ranking it a low resource value wetland.

Wetlands W005a, W009, W010, W027b, W035, and W037 are not adjacent to or do not have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water; therefore, these wetlands were classified as isolated (see **Appendix B**).

4.2.2 Scrub-Shrub Wetlands

Scrub/shrub wetlands total approximately 13 acres and include Wetlands W004, W011, and W016 (**Appendix A, Figure 7**).

W004 is a PSS wetland in the eastern portion of the Project site located in an agricultural field. W004 was recently clear-cut and was not adjacent to or did not have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water; therefore, this wetland was classified as isolated. Primary and secondary wetland hydrology indicators observed during the field assessment included water-stained leaves and drainage patterns. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile, and prominent redoximorphic concentrations. Vegetation found in the sapling/shrub stratum includes green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*), while the herb stratum includes broadleaf cattail, fireweed (*Epilobium angustifolium*), common rush, and Pennsylvania smartweed. The TVARAM score for W004 is 46, ranking it a moderate resource value wetland.

W011 is a PSS wetland in the central portion of the Project site located in an agricultural field north of Alabama Highway 20. W011 was recently clear-cut and was not adjacent to or did not have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water; therefore, this wetland was classified as isolated. Primary and secondary wetland hydrology indicators observed during the field assessment included surface water, high water table, saturation, water marks, sediment deposits, drainage patterns, and geomorphic position. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile, and prominent redoximorphic concentrations. Vegetation found in the sapling/shrub stratum includes green ash, while the herb stratum includes barnyard grass, Pennsylvania smartweed, trumpet vine, and buttonbush. The TVARAM score for W011 is 43, ranking it a moderate resource value wetland.

W016 is a PSS wetland located in the central portion of the Project site north of Country Road 387. Primary and secondary wetland hydrology indicators water marks, water-stained leaves, drainage patterns, and geomorphic position. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile, and prominent redoximorphic concentrations. Vegetation found in the sapling/shrub stratum includes black willow, American sycamore (*Platanus occidentalis*), and elderberry (*Sambucus nigra*). Vegetation found in the herb stratum includes common rush, trumpet vine, and Georgia bulrush. The TVARAM score for W016 is 52, ranking it a moderate resource value wetland.

4.2.3 Forested Wetlands

Forested wetlands total approximately 314 acres and include Wetlands W001, W002a, W003, W005b, W006, W008, W012 through W015, W017 through W027a, W028, W029, W030b through W033, and W038 (**Appendix A, Figure 7**).

W001 is a PFO wetland in the eastern portion of the Project site located in an agricultural field north of Alabama Highway 20. W001 was not adjacent to or did not have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water; therefore, this wetland was classified as isolated. Primary and secondary wetland hydrology indicators observed during the field assessment included water marks, sediment deposits, water-stained leaves, and drainage patterns. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Vegetation found in the tree stratum includes willow oak (*Quercus phellos*), sweetgum (*Liquidambar styraciflua*), and sugarberry (*Celtis laevigata*). Vegetation found in the scrub layer includes red mulberry (*Morus rubra*), while the herb species include trumpet vine, common greenbrier (*Smilax rotundifolia*), and poison ivy (*Toxicodendron radicans*). The TVARAM score for W001 is 42, ranking it a moderate resource value wetland.

W002a is a PFO wetland in the northeastern portion of the Project site and continues off-site to the north. Primary and secondary wetland hydrology indicators observed during the field assessment included sediment deposits, water-stained leaves, aquatic fauna, drainage patterns, saturation visible on aerial imagery, and geomorphic position. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile, and prominent redoximorphic concentrations. Vegetation found in the tree stratum includes green ash and overcup oak (*Quercus lyrate*), while the scrub layer includes buttonbush. The TVARAM score for W002a is 61, ranking it a superior resource value wetland.

W003 is a PFO wetland in the eastern portion of the Project site located in an agricultural field. W003 was not adjacent to or did not have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water; therefore, this wetland was classified as isolated. Primary and secondary wetland hydrology indicators observed during the field assessment included surface water, high water table, saturation, water marks, sediment deposits, water-stained leaves, sparsely vegetated concave surface, and drainage patterns. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Vegetation found in the tree stratum includes willow oak and sugarberry. Vegetation found in the scrub layer includes sugarberry, green ash, and Chinese privet (*Ligustrum sinense*). The TVARAM score for W003 is 45, ranking it a moderate resource value wetland.

W005b and W012 are PFO wetlands in the southeastern portion of the Project site north of Alabama Highway 20. Primary and secondary wetland hydrology indicators observed during the field assessment included water marks, sediment deposits, water-stained leaves, surface soil cracks, moss trim lines, and drainage patterns. Hydric soil indicators include a depleted matrix within the upper 12 inches of the soil profile, and prominent redoximorphic concentrations. Vegetation found in the tree stratum includes sweetgum, willow oak red maple, and sugarberry. Vegetation found in the scrub layer includes American elm and sweetgum. The TVARAM score for W005b is 36 and W012 is 55, ranking them as moderate resource value wetlands.

W006 is a PFO wetland located in the north of the Project site and drain S001 through S005 and E003. Primary and secondary wetland hydrology indicators observed during the field assessment included surface water, high water table, saturation, water marks, sediment deposits, water-stained leaves, and drainage patterns. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Vegetation found in the tree and shrub stratums include black willow, elderberry, and Chinese privet. Vegetation found in the herb and woody vine layers include Pennsylvania smartweed, false nettle (*Boehmeria cylindrica*), and jewelweed (*Impatiens capensis*). The TVARAM score for W006 is 68, ranking it as superior resource value wetlands.

W008 is a PFO wetland located in the north of the Project site and drain S001 and S007. Primary and secondary wetland hydrology indicators observed during the field assessment included water marks, sediment deposits, water-stained leaves, and drainage patterns. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Mid-story and canopy species include sugarberry, black willow, box elder, sweetgum, and Chinese privet. Herbaceous and woody vine vegetation includes include Pennsylvania smartweed, false nettle, hop sedge, poison ivy, greenbrier, and pepper-vine. The TVARAM score for W008 is 81, ranking it as superior resource value wetlands.

Wetlands W013 through W015, and W017 are PFO wetlands located in the central portion the Project site and connect to S008. Within the Study Area W017 is comprised of two separate polygons; however, these areas are part of the same wetland system and are connected outside of the Study Area. Primary and secondary wetland hydrology indicators observed during the field assessment includes surface water, high water table, saturation, water marks, sediment deposits, water-stained leaves, and drainage patterns. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Mid-story and canopy species include sweetgum, green ash, willow oak, and sugarberry. Herbaceous and woody vine vegetation includes include Chinese privet, trumpet vine, greenbrier, and Japanese honeysuckle. The TVARAM score for W013 is 58 and W014 is 54, ranking them as moderate resource value wetlands. The TVARAM score for W015 is 77 and W017 is 60, ranking them as superior resource value wetlands.

W018 and W020 are large PFO wetlands located in the central portion of the Project site. Primary and secondary wetland hydrology indicators observed during the field assessment includes water marks, water-stained leaves, drainage patterns, and moss trim lines. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Vegetation found in the tree and shrub stratums of these wetlands include overcup oak, water oak, sweetgum, and Chinese privet. Vegetation found in the herb layer includes water oak, overcup oak, and trumpet vine. The TVARAM score for W018 is 54 and W020 is 51, ranking them as moderate resource value wetlands.

W019, W021, W022, W023, W027a, W028, and W029 are isolated PFO wetlands located in the central portion of the Project site. Primary and secondary wetland hydrology indicators observed during the field assessment includes water marks, water-stained leaves, drainage patterns, and moss trim lines. Vegetation found in the tree and shrub stratums of these wetlands include sugarberry, sweetgum, willow oak, American elm, and loblolly pine. Vegetation found in the herb and woody vine layers include trumpet vine, greenbier, muscadine, and poison ivy. The TVARAM score for W021 through W023 is 24 and W027a is 20, ranking them as low resource value wetlands. The TVARAM score for W019 is 54, W028 is 54, and W029 is 47, ranking them as moderate resource value wetlands.

W024 is a large PFO wetland located on the eastern portion of the Project site. Primary and secondary wetland hydrology indicators observed during the field assessment included drainage patterns, saturation visible on aerial imagery, and stunted or stressed plants. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Vegetation found in the tree stratum includes black willow and loblolly pine (*Pinus taeda*). Vegetation found in the scrub layer includes sugarberry. The TVARAM score for W024 is 66, ranking it a superior resource value wetland.

W025 is an isolated PFO wetland in the eastern portion of the Project site located west of Country Road 385. Primary and secondary wetland hydrology indicators observed during the field assessment included water-stained leaves, drainage patterns, and geomorphic position. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Vegetation found in the tree stratum includes sweetgum and loblolly pine. Vegetation found in the scrub layer includes sweetgum, while the herb species include fringed sedge (*Carex crinite*) and false nettle. The TVARAM score for W025 is 20, ranking it a low resource value wetland.

W026 is a PFO wetland connected to the eastern boundary of the Project site west of Country Road 385. Primary and secondary wetland hydrology indicators observed during the field assessment included drift deposits and drainage patterns. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Vegetation found in the tree and shrub stratums of these wetlands include loblolly pine, sugar berry, and blackgum. Vegetation found in the herb layer includes trumpet vine and tall goldenrod. The TVARAM score for W026 is 24, ranking it a low resource value wetland.

W030b and W031 through W033 are PFO wetlands in the southeastern portion of the Project site. Primary and secondary wetland hydrology indicators observed during the field assessment included drift deposits, water-stained leaves, and drainage patterns. Hydric soil indicators include a depleted matrix with prominent redox concentrations. Vegetation found in the tree and shrub stratums of these wetlands include willow oak, red maple, black willow, blackgum, American snowbell, and Chinese privet. Vegetation found in the herb layer includes greenbier, common rush, and lizard’s tail. The TVARAM score for W030b is 47, W031 is 38, W032 is 50, and W033 is 41, ranking them as moderate resource value wetlands.

W038 is a PFO wetland located in the northern portion of the Project site. Primary and secondary wetland hydrology indicators observed during the field assessment included water-stained leaves, moss trim lines, and geomorphic position.

Vegetation found in the tree and shrub stratums of these wetlands include loblolly pine, sugar berry, and blackgum. Vegetation found in the herb layer includes trumpet vine and tall goldenrod.

Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. The TVARAM score for W038 is 33, ranking it a moderate resource value wetland.

Table 3 Summary of Delineated Wetlands

Feature Identifier	Cowardin Code[1]	TVARAM Category (Score)	Latitude	Longitude	Presumed Jurisdiction		Acreage within Study Area
					Section 404	Section 401	
W001	PFO1C	Moderate (42)	34.672789	-87.284853	No	No	0.77
W002a	PFO1C	Superior (61)	34.677257	-87.279187	Yes	Yes	11.17
W002b	PEM1C	Superior (61)	34.677229	-87.280978	Yes	Yes	1.99
W002c	PEM1C	Superior (61)	34.676187	-87.279141	Yes	Yes	0.73
W003	PFO1C	Moderate (45)	34.674236	-87.277607	No	No	0.37
W004	PSS1C	Moderate (46)	34.669081	-87.279820	No	No	4.85
W005a	PEM1C	Moderate (36)	34.661672	-87.274335	No	No	0.14
W005b	PFO1C	Moderate (36)	34.660579	-87.275803	Yes	Yes	0.66
W005c	PEM1C	Moderate (36)	34.660210	-87.276262	Yes	Yes	0.34
W006	PFO1E	Superior (68)	34.677360	-87.262399	Yes	Yes	6.95
W007	PEM1E	Superior (62)	34.679907	-87.257720	Yes	Yes	0.40
W008	PFO1E	Superior (81)	34.677951	-87.254685	Yes	Yes	19.46
W009	PEM1C	Moderate (37)	34.665759	-87.269778	No	No	0.95
W010	PEM1C	Moderate (37)	34.662529	-87.268566	No	No	6.74
W011	PSS1E	Moderate (43)	34.661725	-87.256663	No	No	4.35
W012	PFO1B	Moderate (55)	34.657719	-87.263697	Yes	Yes	29.06
W013	PFO1C	Moderate (58)	34.676622	-87.245264	Yes	Yes	31.49
W014	PFO1C	Moderate (54)	34.679429	-87.240993	Yes	Yes	0.93
W015	PFO1C	Superior (77)	34.681051	-87.239420	Yes	Yes	13.71
W016	PSS1E	Moderate (52)	34.672679	-87.241693	Yes	Yes	3.66
W017	PFO1A	Superior (60)	34.666929	-87.241343	Yes	Yes	27.17
W018	PFO1C	Moderate (54)	34.662712	-87.232380	Yes	Yes	12.69
W019	PFO1C	Moderate (54)	34.659787	-87.231566	No	No	0.80
W020	PFO1E	Moderate (51)	34.667999	-87.226721	Yes	Yes	61.40
W021	PFO1E	Low (24)	34.662680	-87.224534	No	No	0.27
W022	PFO1E	Low (24)	34.661052	-87.224407	No	No	1.14
W023	PFO1E	Low (24)	34.663504	-87.222533	No	No	0.23
W024	PFO1E	Superior (66)	34.666299	-87.216795	Yes	Yes	70.03
W025	PFO1E	Low (20)	34.661776	-87.215706	No	No	0.08
W026	PFO1E	Low (24)	34.661962	-87.211583	Yes	Yes	0.42
W027a	PFO1E	Low (20)	34.659065	-87.228619	No	No	0.03
W027b	PEM1E	Low (20)	34.659096	-87.228305	No	No	0.30
W028	PFO1E	Moderate (54)	34.655010	-87.228494	No	No	1.59
W029	PFO1E	Moderate (47)	34.652476	-87.224766	No	No	1.94
W030a	PEM1E	Moderate (47)	34.651811	-87.222483	Yes	Yes	2.50
W030b	PFO1E	Moderate (47)	34.650055	-87.220404	Yes	Yes	12.32
W031	PFO1E	Moderate (38)	34.649660	-87.215051	Yes	Yes	3.92

Feature Identifier	Cowardin Code[1]	TVARAM Category (Score)	Latitude	Longitude	Presumed Jurisdiction		Acreage within Study Area
					Section 404	Section 401	
W032	PFO1E	Moderate (50)	34.654174	-87.211437	Yes	Yes	4.16
W033	PFO1E	Moderate (41)	34.650365	-87.211279	Yes	Yes	0.76
W034	PEM1C	Low (21)	34.788757	-87.379491	Yes	Yes	0.13
W035	PEM1C	Low (18)	34.765290	-87.359268	No	No	0.09
W036	PEM1C	Moderate (43)	34.695526	-87.288255	Yes	Yes	2.37
W037	PEM1C	Low (11)	34.682626	-87.267893	No	No	0.25
W038	PFO1E	Moderate (33)	34.677768	-87.232415	Yes	Yes	0.43
					Wetlands Total:		**343.74**

1. PEM1C: Palustrine, emergent, persistent, seasonally flooded wetland
PEM1E: Palustrine, emergent, persistent, seasonally flooded/saturated wetland
PSS1C: Palustrine, scrub-shrub, persistent, seasonally flooded wetland
PSS1E: Palustrine, scrub-shrub, persistent, seasonally flooded/saturated wetland
PFO1A: Palustrine, forested, broad-leaved deciduous, temporary flooded wetland
PFO1B: Palustrine, forested, broad-leaved deciduous, saturated wetland
PFO1C: Palustrine, forested, broad-leaved deciduous, seasonally flooded wetland
PFO1E: Palustrine, forested, broad-leaved deciduous, seasonally flooded/saturated wetland

4.3 Open Waters

Four open water features (P001 – P004) totaling approximately 1.98 acres (**Appendix A, Figure 7**) were identified as palustrine, unconsolidated bottom, permanently flooded (PUBH) according to the Cowardin et al. (1979) hierarchical structure (**Table 4**).

Table 4 Summary of Open Waters

Feature Identifier	Cowardian Classification[1]	Center Coordinates		Acreage within Study Area
		Latitude	Longitude	
P001	PUBH	34.681406	-87.255710	0.15
P002	PUBH	34.670131	-87.224201	1.32
P003	PUBH	34.788730	-87.379157	0.04
P004	PUBH	34.680367	-87.260103	0.47
			Open Waters Total:	**1.98**

1. PUBH: Palustrine Unconsolidated Bottom, Permanently Flooded.

4.4 Non-relatively Permanent Waters

Multiple ephemeral features were identified, which are not considered to be RPWs and are not expected to be subject to federal jurisdiction (**Appendix A, Figures 7.1 – 7.19**). In accordance with TVA guidelines, TDEC Hydrologic Determination (HD) methods were also used to classify surface waters. According to the TDEC Division of Water Resources (DWR) *Guidance for Making Hydrologic Determinations*, non-permanent waters with ephemeral flow that are only in direct response to precipitation runoff are classified as wet weather conveyances (WWC) (TDEC 2020). The features include non-RPW E001 through E021. These features were dry, did not exhibit an OHWM or a defined bed and bank, and may have had upland rooted plants growing in the bottom of the channel. These features only flow during wet weather events but can provide a hydrological connection between features and downstream waters.

These non-RPW WWC features total 5,168 linear feet within the Study Area. The majority of these features are located in agricultural fields, are erosional features, and result from both natural hydrology flows and irrigation practices. A summary of non-RPW WWC features is provided in **Table 5**.

Table 5 Summary of Non-relatively Permanent Waters

Feature Identifier	Cowardin Code[1]	TDEC HD Determination (Score)	Streamside Management Zone Category[2]	Latitude	Longitude	Presumed Jurisdiction		Linear Feet within Study Area
						Section 404	Section 401	
E001	R6	WWC (2.5)	BMPs	34.673293	-87.277160	No	No	708
E002	R6	WWC (6)	BMPs	34.666989	-87.279983	No	No	902
E003	R6	WWC (13.5)	BMPs	34.677142	-87.262239	No	No	70
E004	R6	WWC (11.5)	BMPs	34.671319	-87.257673	No	No	727
E005	R6	WWC (8)	BMPs	34.670483	-87.253309	No	No	393
E006	R6	WWC (17.5)	BMPs	34.683460	-87.241075	No	No	316
E007	R6	WWC (15.5)	BMPs	34.683254	-87.240927	No	No	79
E008	R6	WWC (18)	BMPs	34.683093	-87.240062	No	No	73
E009	R6	WWC (5)	BMPs	34.791799	-87.380965	No	No	104
E010	R6	WWC (3)	BMPs	34.781623	-87.375343	No	No	225
E011	R6	WWC (8.5)	BMPs	34.774520	-87.368285	No	No	110
E012	R6	WWC (7)	BMPs	34.770142	-87.364282	No	No	75
E013	R6	WWC (5.5)	BMPs	34.759997	-87.354015	No	No	112
E014	R6	WWC (5.5)	BMPs	34.755233	-87.349365	No	No	59
E015	R6	WWC (8.5)	BMPs	34.749284	-87.343022	No	No	174
E016	R6	WWC (11.5)	BMPs	34.742827	-87.336396	No	No	146
E017	R6	WWC (8.5)	BMPs	34.726701	-87.320019	No	No	159
E018	R6	WWC (5.5)	BMPs	34.669369	-87.288466	No	No	21
E019	R6	WWC (7)	BMPs	34.668518	-87.284965	No	No	237
E020	R6	WWC (8)	BMPs	34.667479	-87.237470	No	No	274
E021	R6	WWC (8)	BMPs	34.677068	-87.231181	No	No	204
Total Non-relatively Permanent Waters:								**5,168**

1. R6: Riverine, ephemeral.
2. BMPs = Best management practices.

4.5 Potential Waters of the U.S.

A total of 60 potential WOTUS, including 12 streams, 44 wetlands, and 4 areas of open water were identified within the Study Area, totaling approximately 10,403 linear feet of stream channel, 343.74 acres of wetlands, and 1.98 acres of open waters (**Appendix A, Figure 7**).

5 Regulatory

HDR's survey evaluated the potential federal jurisdiction under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. The determinations within this report are subject to review and approval by the USACE Nashville Regulatory District, and the final jurisdictional determinations are within the regulatory authority of the USACE, USEPA, and ADEM.

Depending on the final Project's design, a CWA Section 404 Permit and a Section 401 Water Quality Certification (WQC) may be required if potential impacts to on-site waters of the U.S. are unavoidable. Impacts to WOTUS of less than 0.5 acre associated with the proposed Project are anticipated to be authorized under the USACE Nationwide Permitting program. USACE Nationwide Permit (NWP) 51 for Land-Based Renewable Energy Generation Facilities, NWP 14 (Linear Transportation Project), or NWP 57 (Electric Utility Line and Telecommunications Activities). General processing time for NWPs is approximately 45 calendar days for review and approval. An Individual Permit will be required if the proposed Project impacts to WOTUS exceeds the impact thresholds allowed under an NWP.

6 Results Summary

Results from HDR's on-site field survey identified 12 streams with perennial and intermittent flow, 44 wetlands, 4 open waters, and 21 WWCs within the Study Area. These features include 10,403 linear feet of streams and 319 acres of wetlands within the Study Area (**Table 2** and **Table 3**), which are potentially WOTUS under Section 404 of the CWA. These features would likely be jurisdictional because they exhibit a hydrologic connection to a relatively permanent water. Approximately 5,168 linear feet of ephemeral features and 25 acres of wetlands are not anticipated to be jurisdictional. The USACE Regulatory Division can officially render a final jurisdictional determination for Section 404 requirements through the formal review process. Submittal of a Jurisdictional Determination and coordination with the USACE Nashville Regulatory District is recommended to verify that delineated drainage features are not jurisdictional WOTUS and to determine if Project activities would require a Section 404 permit.

TVA implements Streamside Management Zones (SMZs), which are areas covered with vegetation on both sides of perennial and intermittent streams and along margins of bodies of open water where precaution is used in carrying out construction activities to protect surface waters. The width of SMZs varies depending on the type of surface water, primary use of the surface water, topography, or existing features or land use. SMZ Category A is the protection level applicable to streams, springs, and sinkholes, and requires a 50-foot undisturbed natural buffer. Streams S001 – S007 and S009 –S012 have a Category A SMZ. SMZ Category B requires a 70-foot undisturbed natural buffer. Stream S008 (Wheeler Branch) has a Category B SMZ.

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Appendix A - Figures

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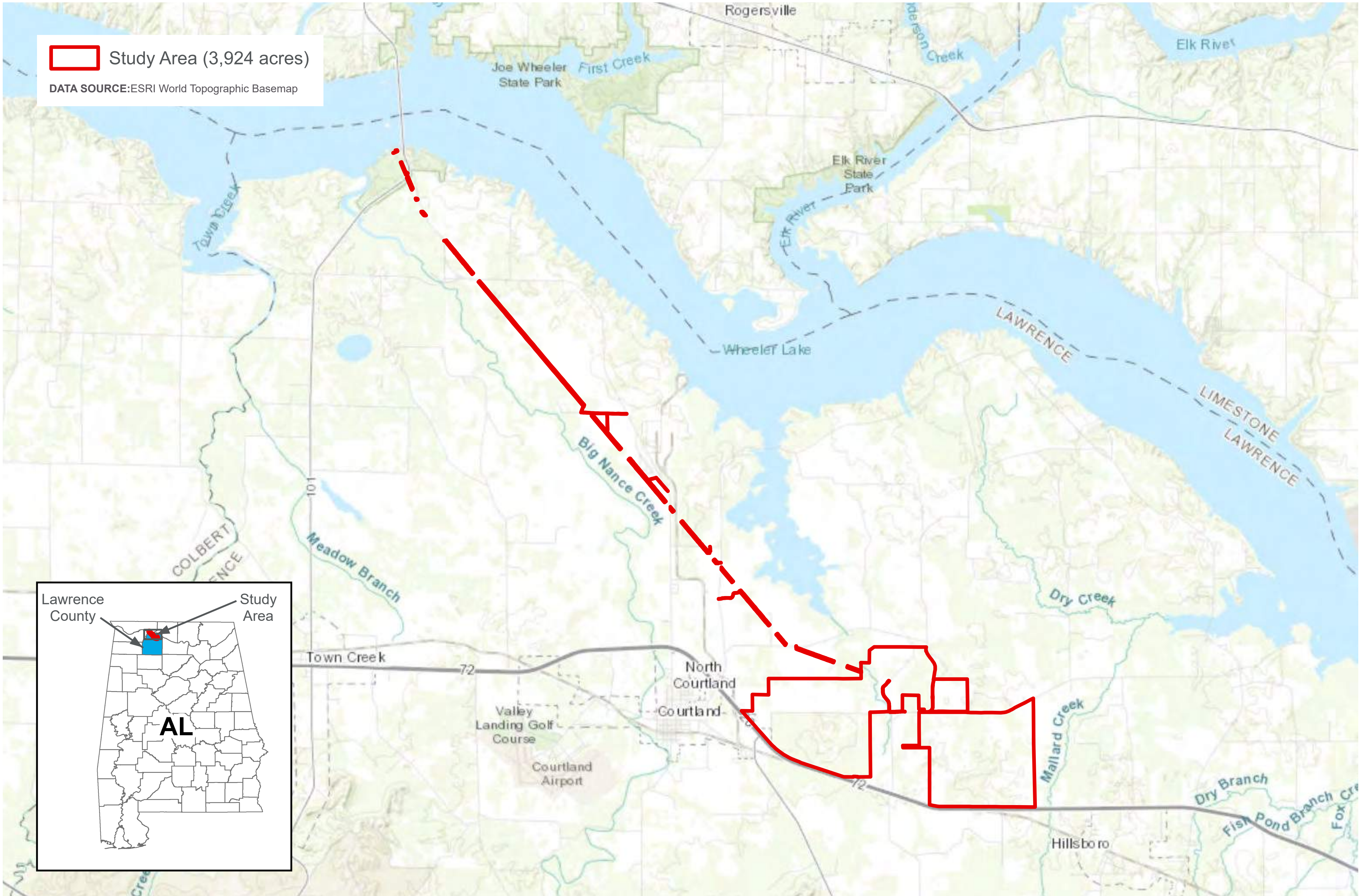

HDR URBANGRID

HILLSBORO SOLAR

PROJECT VICINITY

FIGURE 1

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HDR URBANGRID

HILLSBORO SOLAR

PROJECT AERIAL

FIGURE 2 - PAGE 1 OF 4

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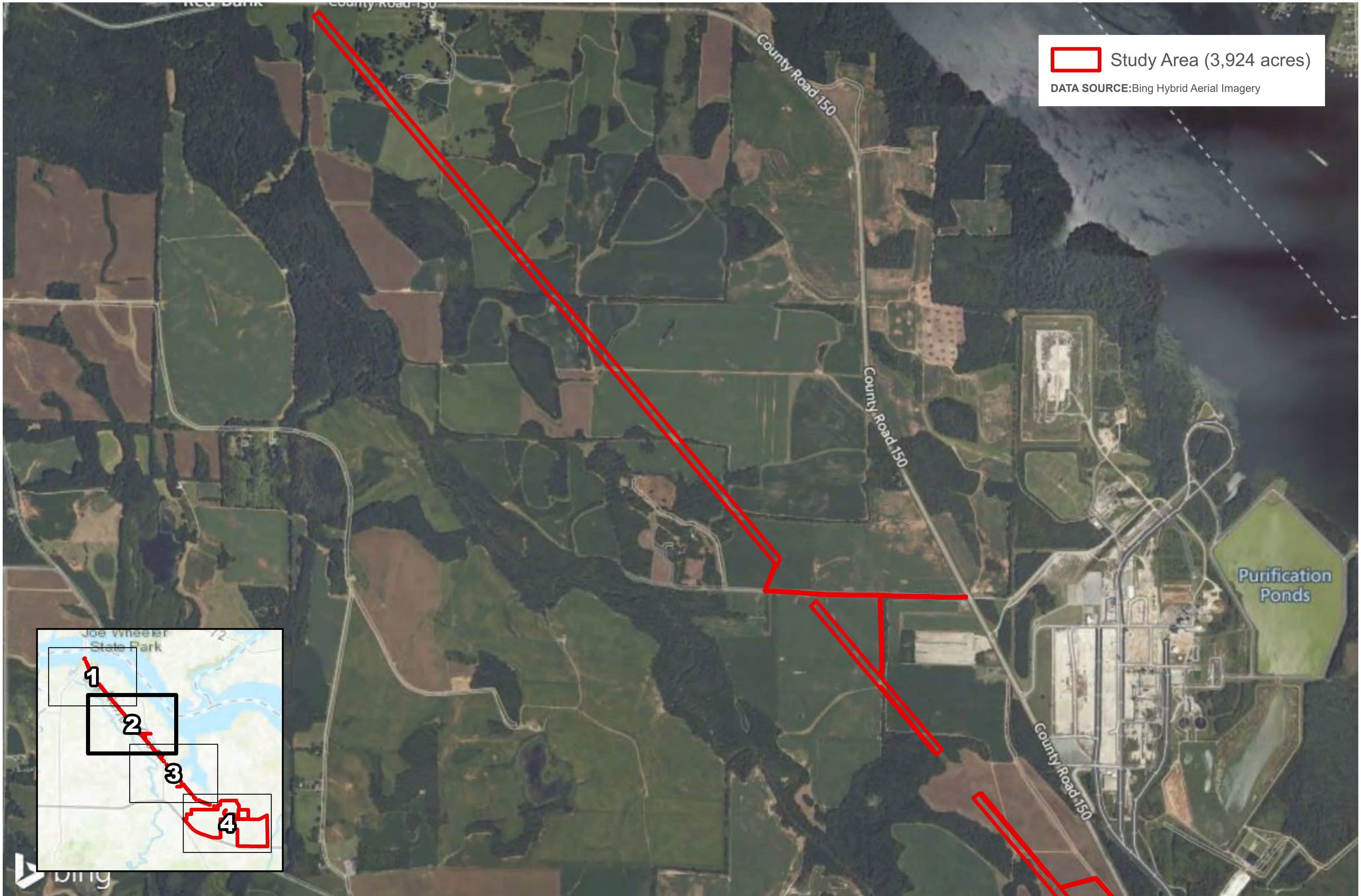

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PROJECT AERIAL

FIGURE 2 - PAGE 2 OF 4

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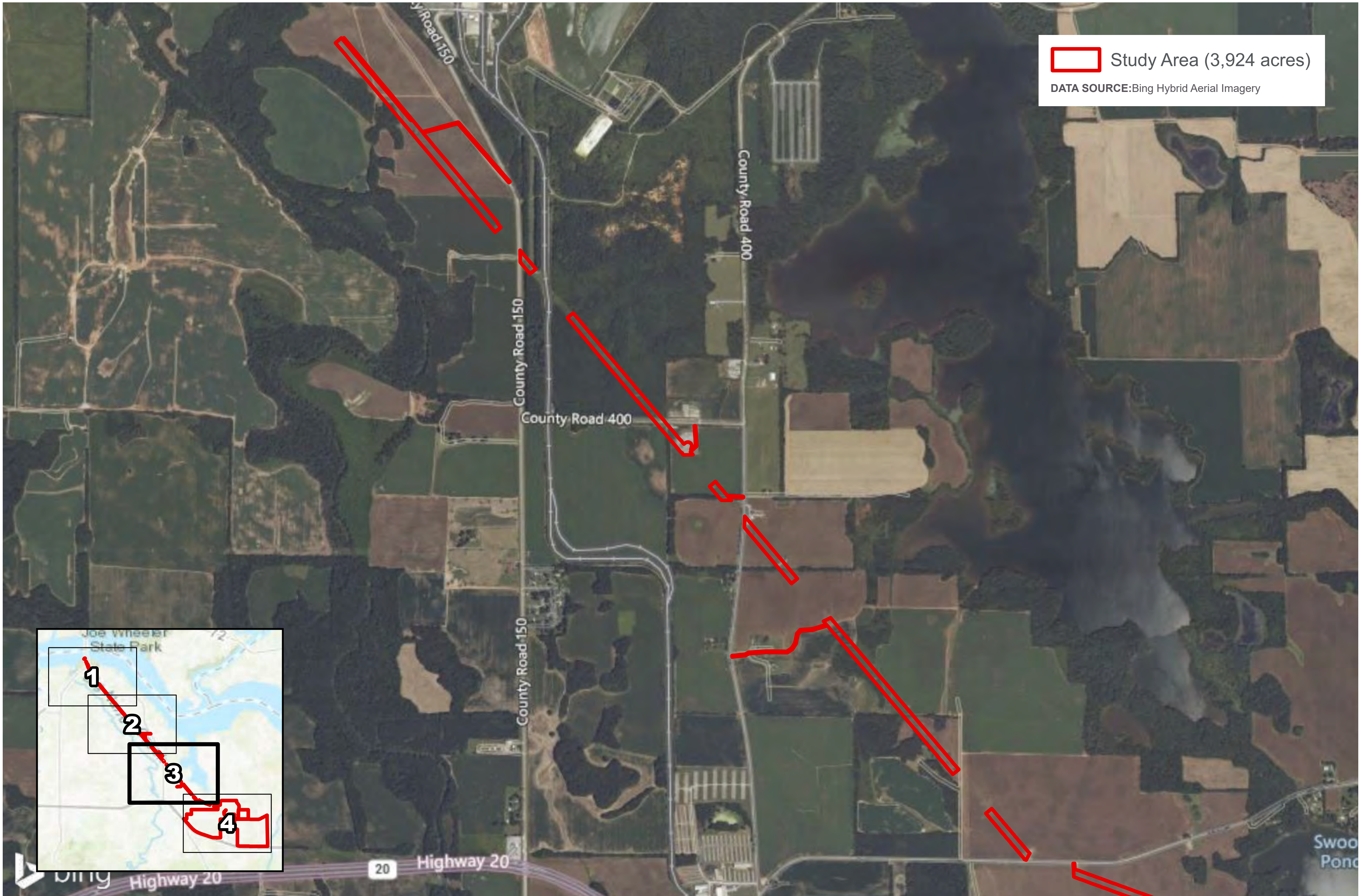

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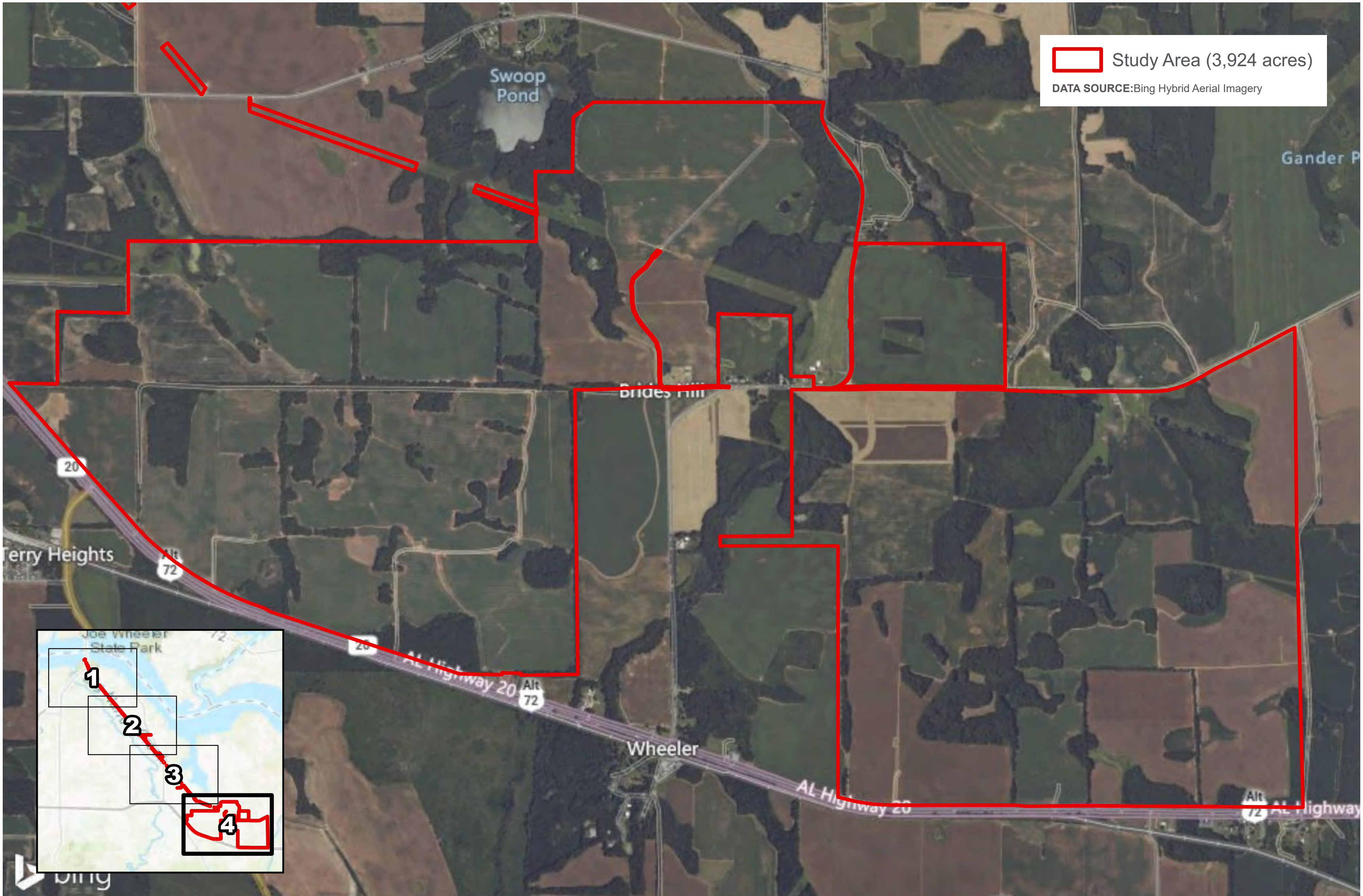
PROJECT AERIAL

FIGURE 2 - PAGE 3 OF 4



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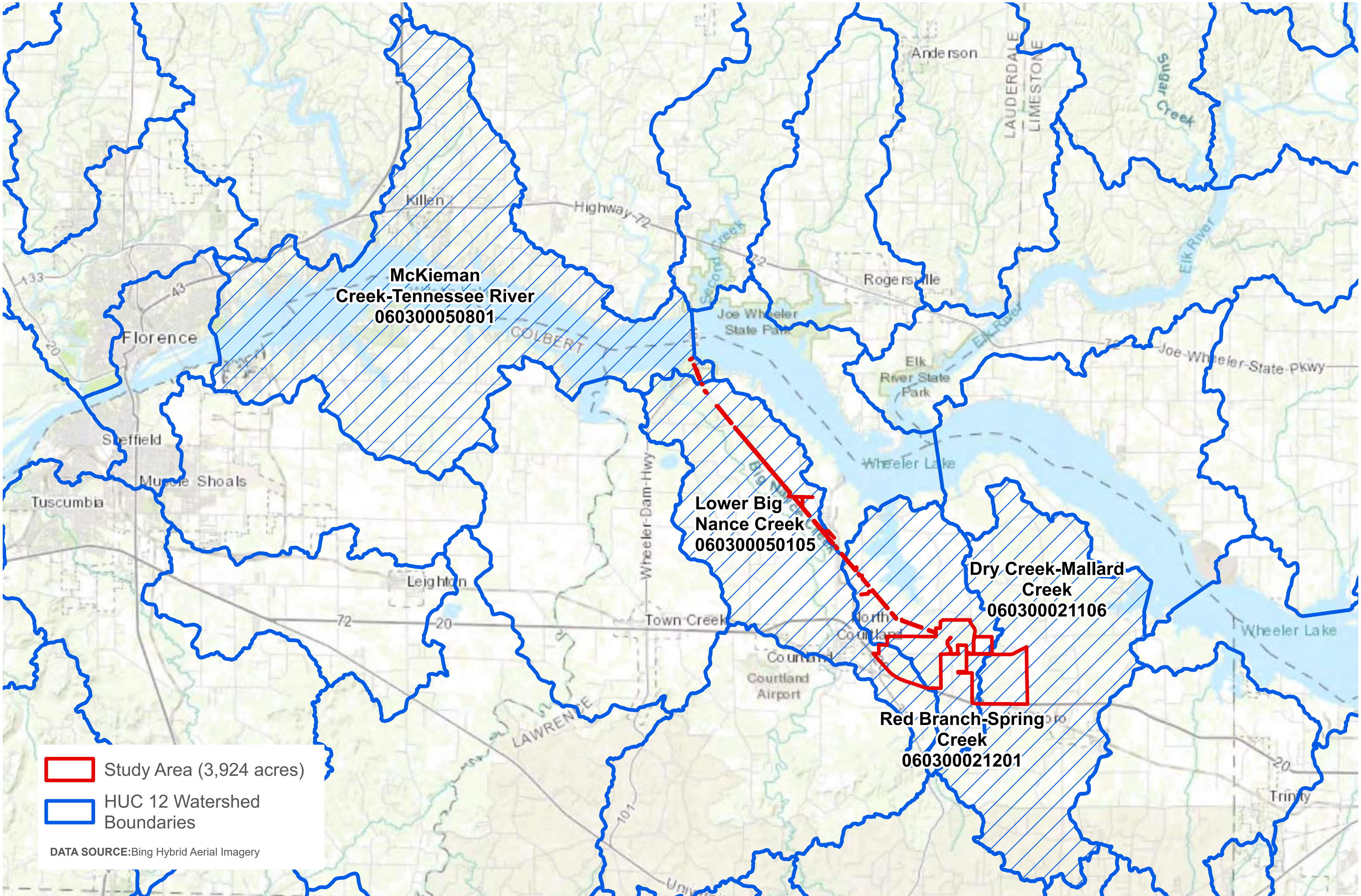
PROJECT AERIAL

FIGURE 2 - PAGE 4 OF 4



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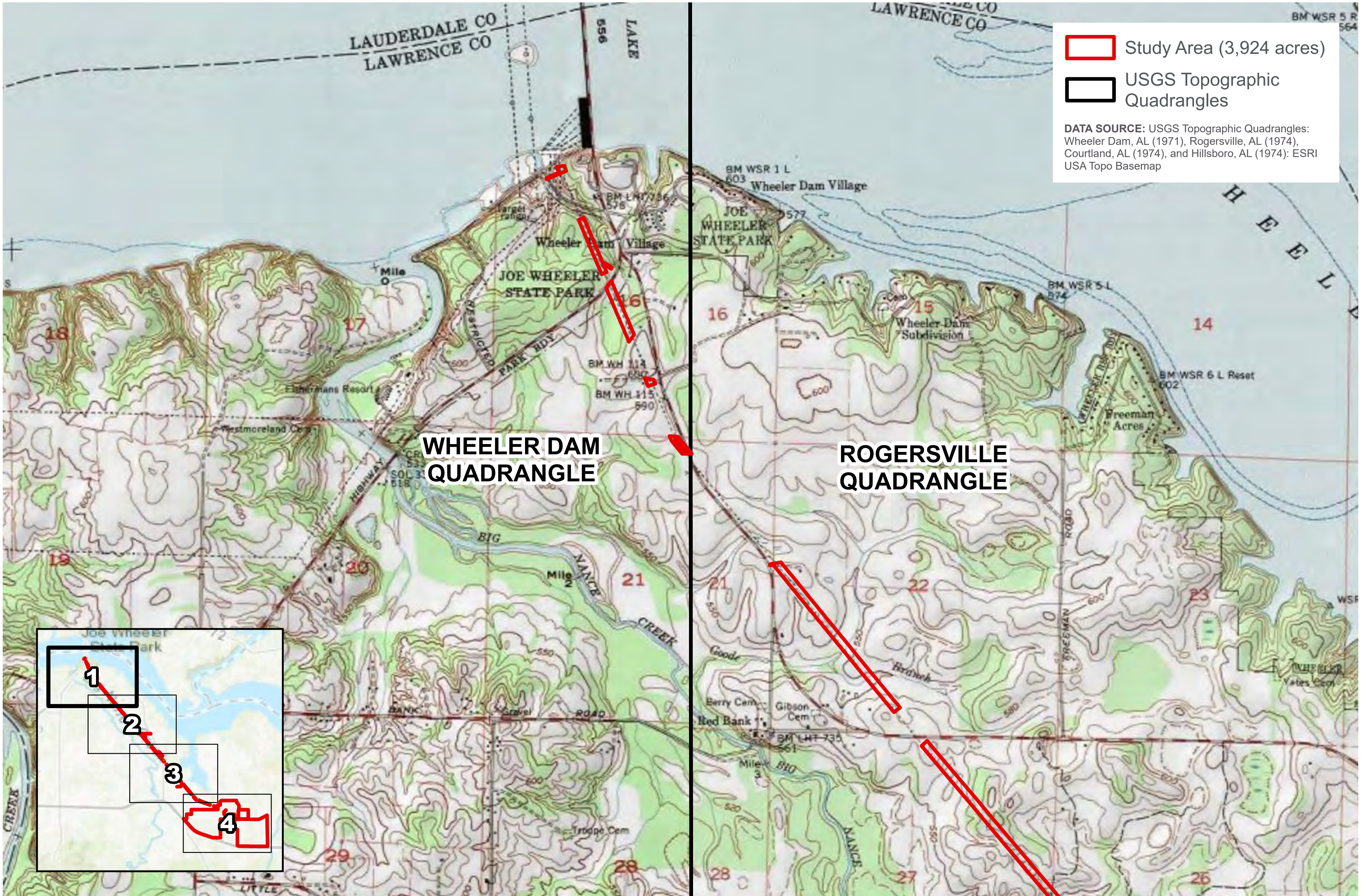
HUC12 WATERSHEDS

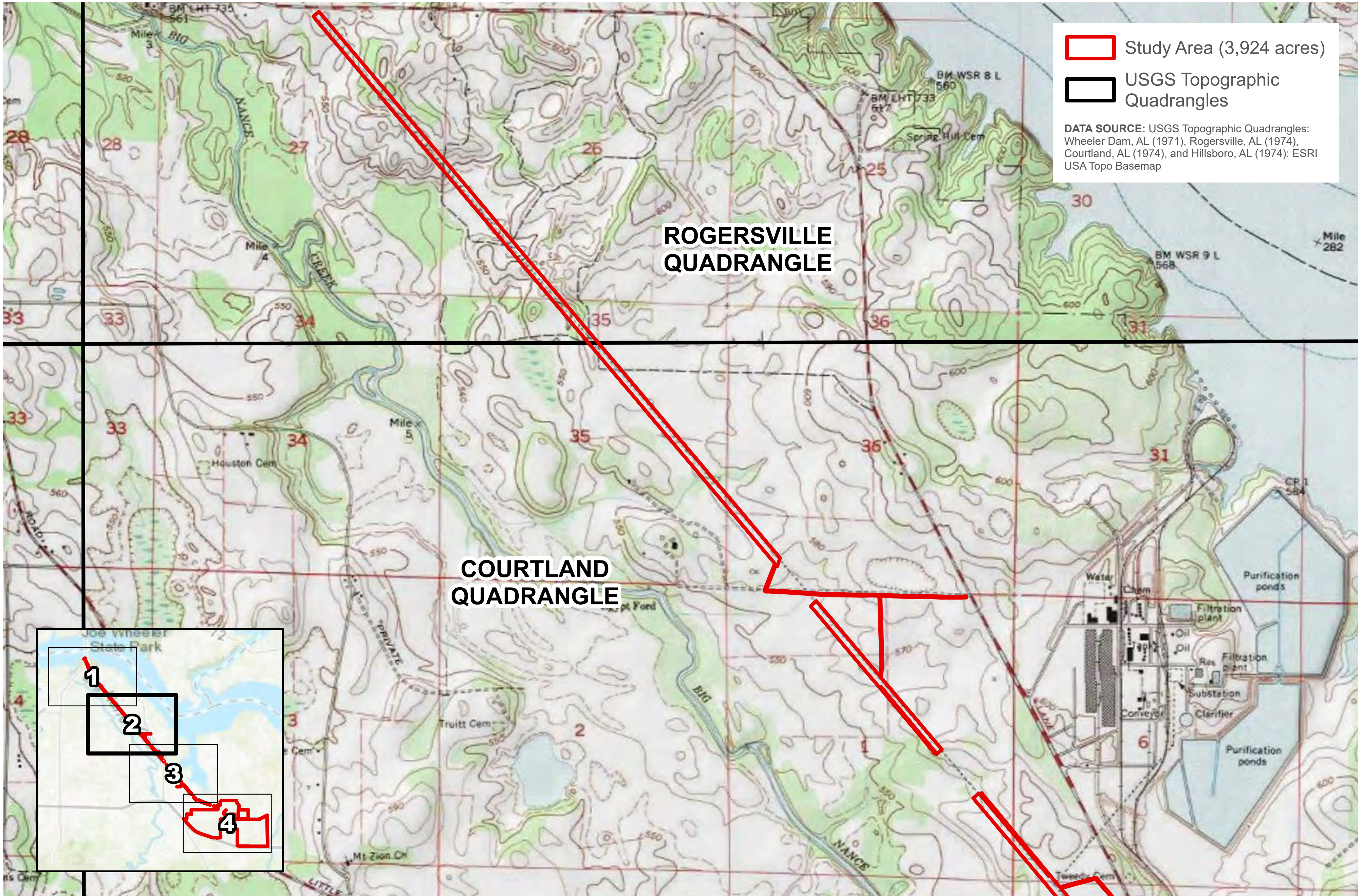
FIGURE 3



HILLSBORO SOLAR

USGS TOPOGRAPHIC QUADRANGLES

FIGURE 4 - PAGE 1 OF 4



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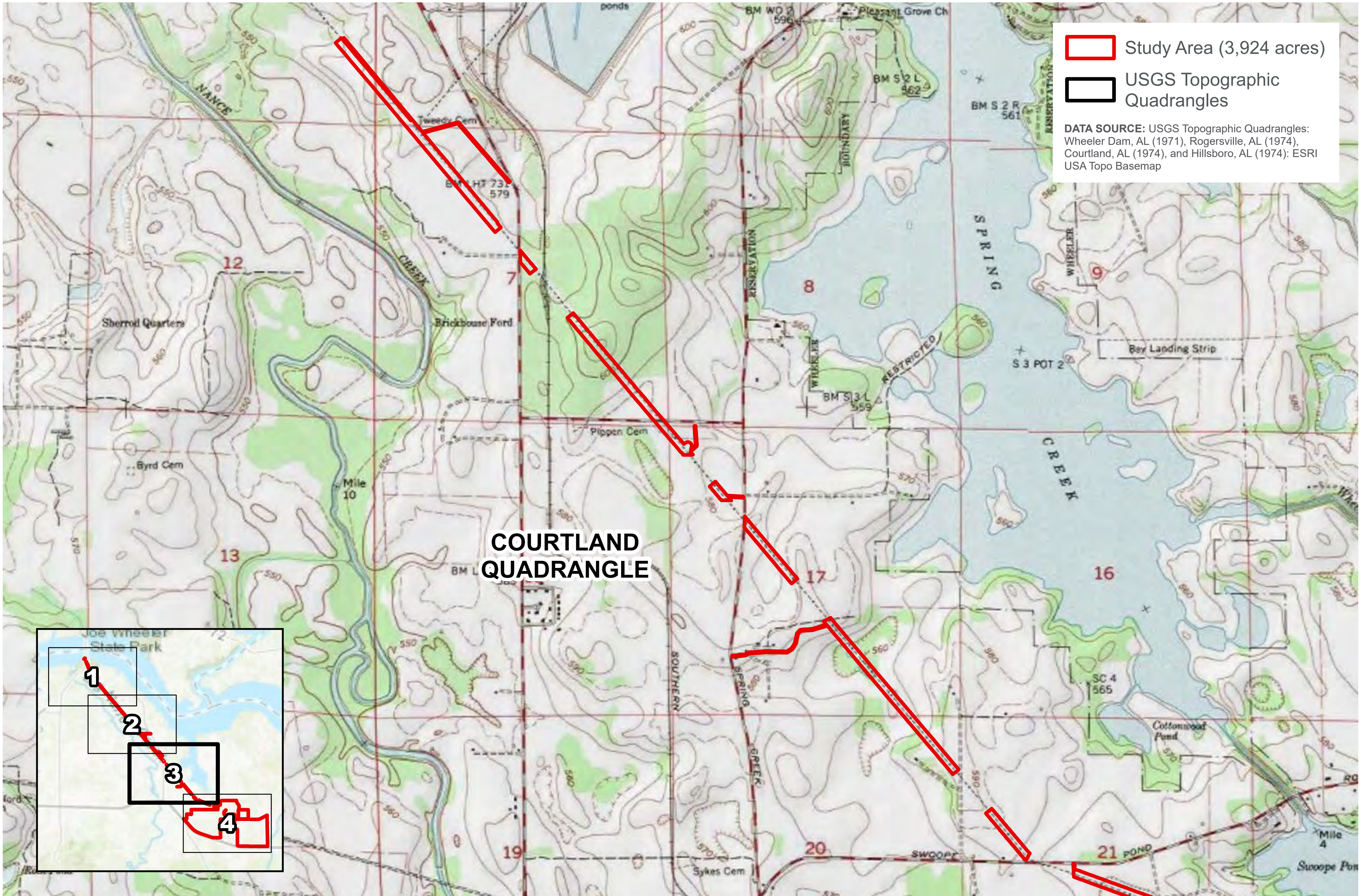
HILLSBORO SOLAR

USGS TOPOGRAPHIC QUADRANGLES

FIGURE 4 - PAGE 2 OF 4



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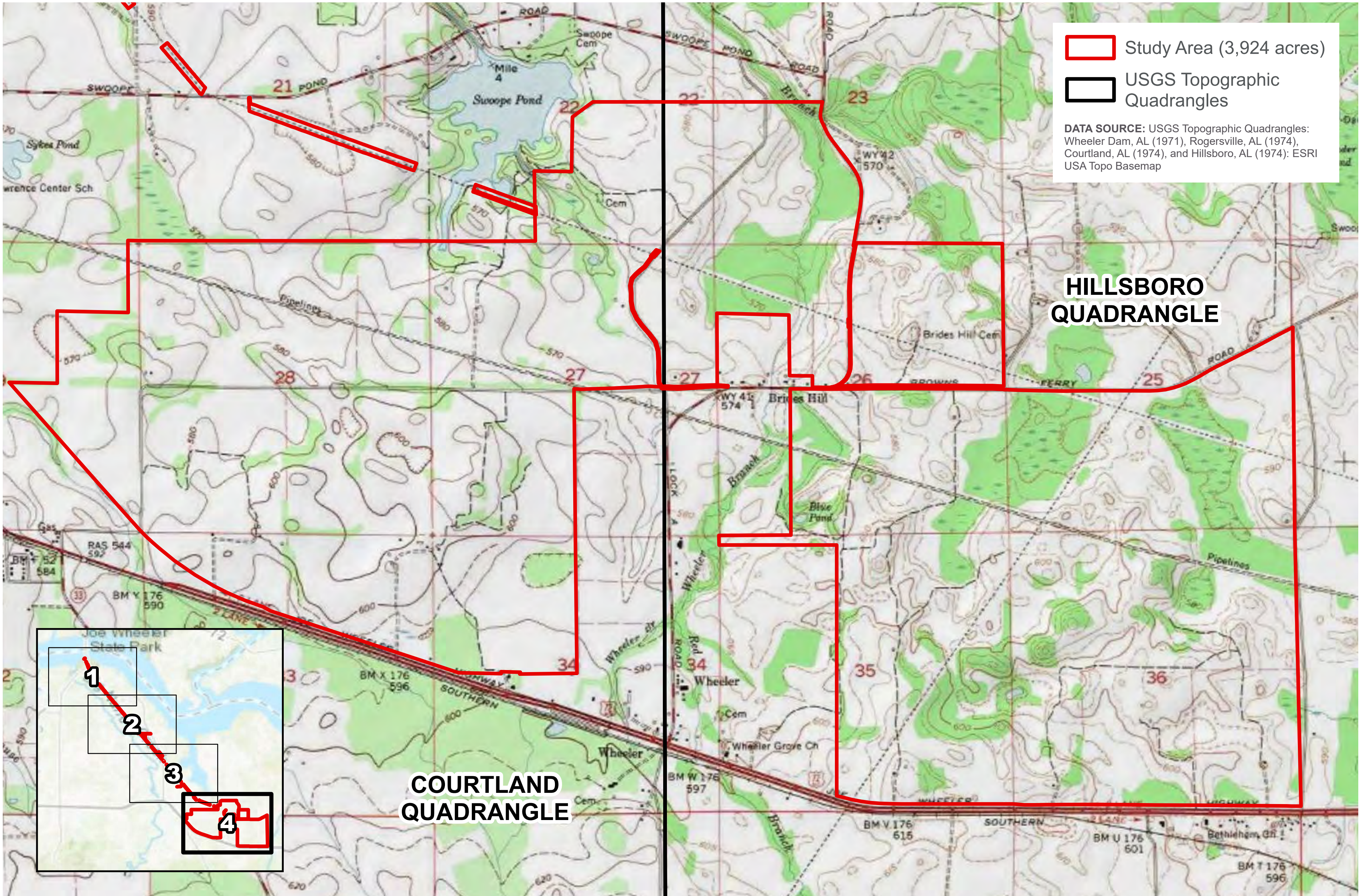
USGS TOPOGRAPHIC QUADRANGLES

FIGURE 4 - PAGE 3 OF 4



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USGS TOPOGRAPHIC QUADRANGLES

FIGURE 4 - PAGE 4 OF 4

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HILLSBORO SOLAR

NRCS SOIL SURVEY OF LAWRENCE COUNTY, AL

FIGURE 5 - PAGE 1 OF 4

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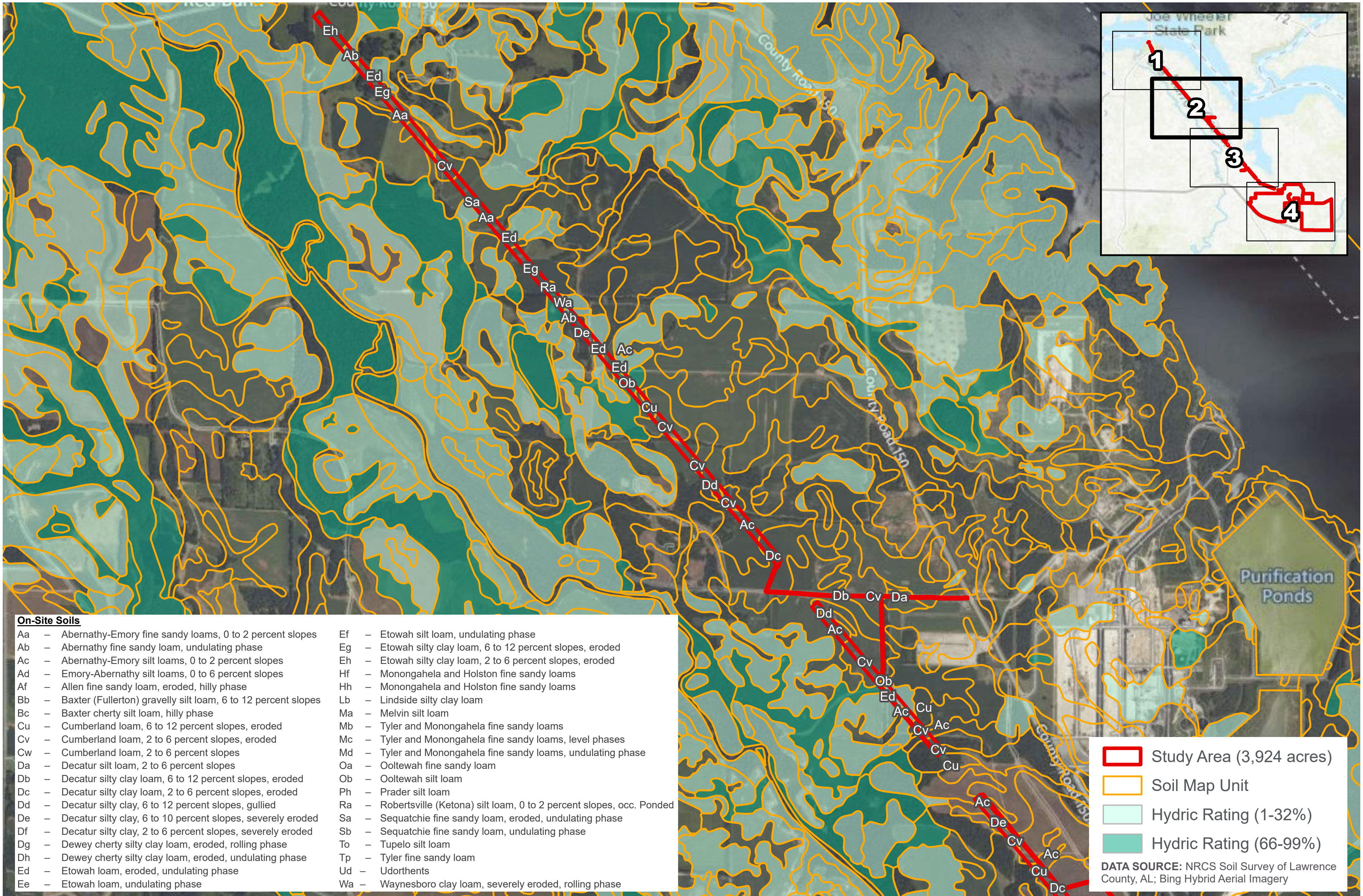

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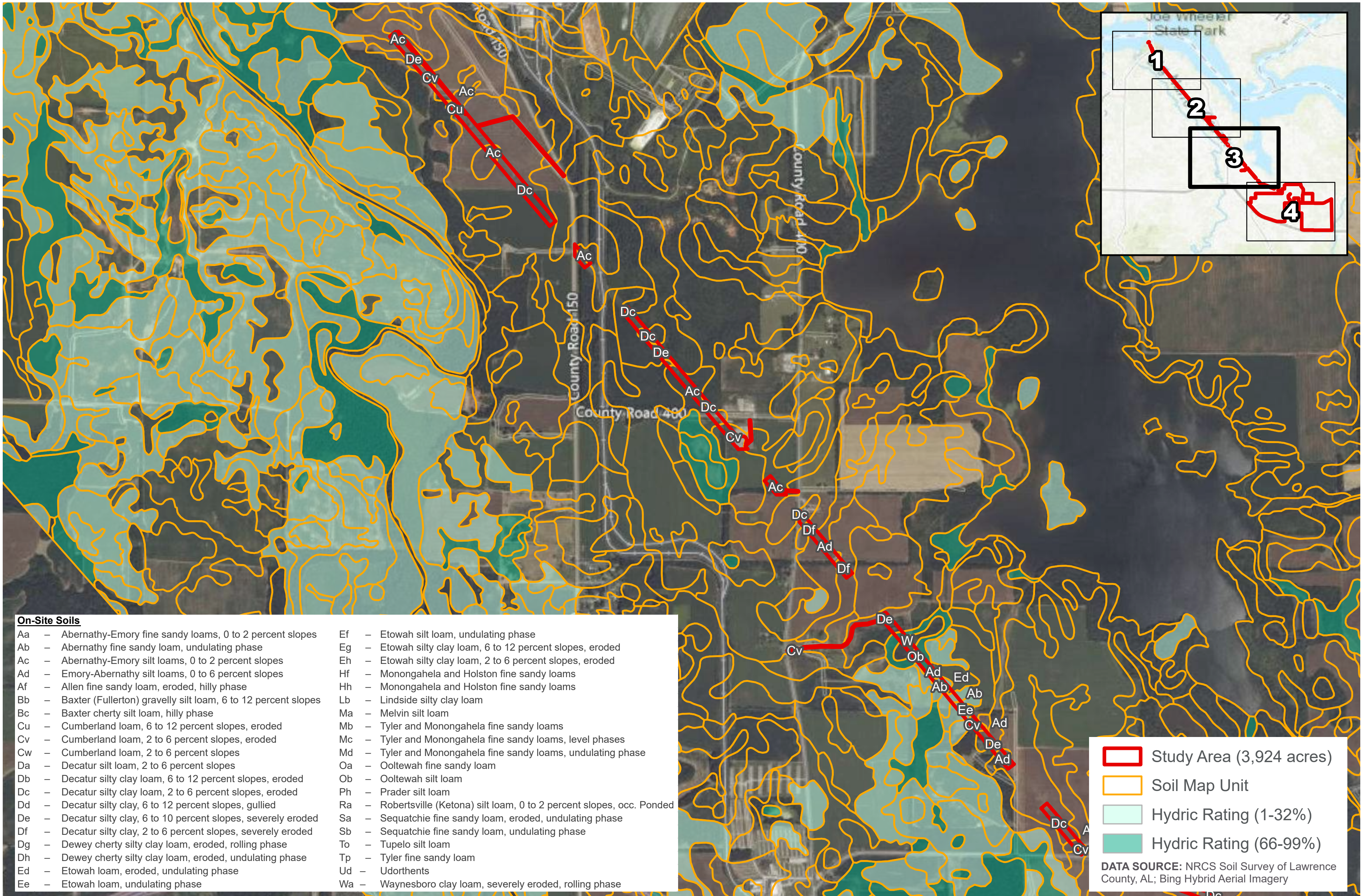
NRCS SOIL SURVEY OF LAWRENCE COUNTY, AL

FIGURE 5 - PAGE 2 OF 4



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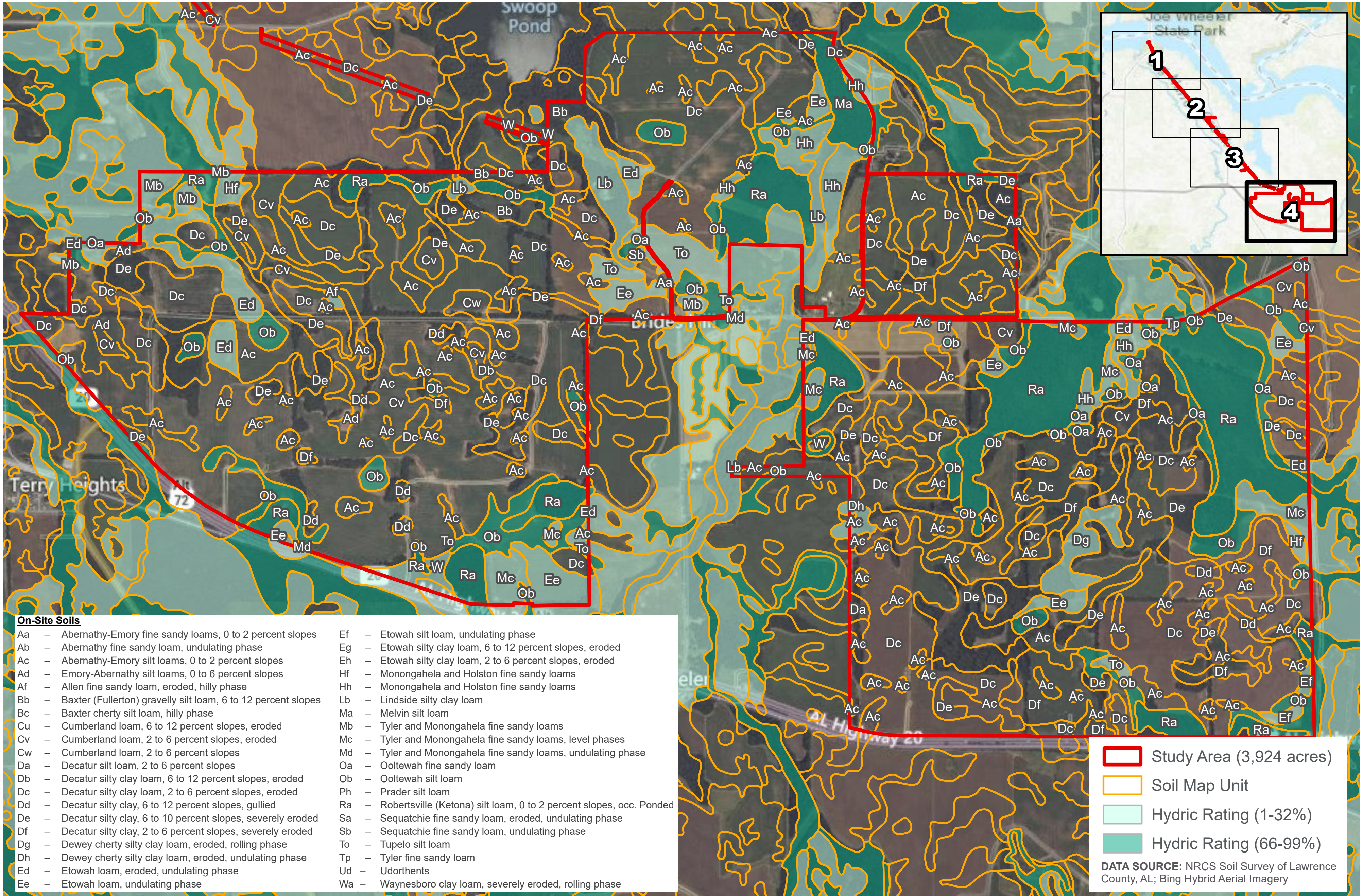
NRCS SOIL SURVEY OF LAWRENCE COUNTY, AL

FIGURE 5 - PAGE 3 OF 4



On-Site Soils

Aa	Abernathy-Emory fine sandy loams, 0 to 2 percent slopes	Ef	Etowah silt loam, undulating phase
Ab	Abernathy fine sandy loam, undulating phase	Eg	Etowah silty clay loam, 6 to 12 percent slopes, eroded
Ac	Abernathy-Emory silt loams, 0 to 2 percent slopes	Eh	Etowah silty clay loam, 2 to 6 percent slopes, eroded
Ad	Emory-Abernathy silt loams, 0 to 6 percent slopes	Hf	Monongahela and Holston fine sandy loams
Af	Allen fine sandy loam, eroded, hilly phase	Hh	Monongahela and Holston fine sandy loams
Bb	Baxter (Fullerton) gravelly silt loam, 6 to 12 percent slopes	Lb	Lindside silty clay loam
Bc	Baxter cherty silt loam, hilly phase	Ma	Melvin silt loam
Cu	Cumberland loam, 6 to 12 percent slopes, eroded	Mb	Tyler and Monongahela fine sandy loams
Cv	Cumberland loam, 2 to 6 percent slopes, eroded	Mc	Tyler and Monongahela fine sandy loams, level phases
Cw	Cumberland loam, 2 to 6 percent slopes	Md	Tyler and Monongahela fine sandy loams, undulating phase
Da	Decatur silt loam, 2 to 6 percent slopes	Oa	Ooltewah fine sandy loam
Db	Decatur silty clay loam, 6 to 12 percent slopes, eroded	Ob	Ooltewah silt loam
Dc	Decatur silty clay loam, 2 to 6 percent slopes, eroded	Ph	Prader silt loam
Dd	Decatur silty clay, 6 to 12 percent slopes, gullied	Ra	Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occ. Ponded
De	Decatur silty clay, 6 to 10 percent slopes, severely eroded	Sa	Sequatchie fine sandy loam, eroded, undulating phase
Df	Decatur silty clay, 2 to 6 percent slopes, severely eroded	Sb	Sequatchie fine sandy loam, undulating phase
Dg	Dewey cherty silty clay loam, eroded, rolling phase	To	Tupelo silt loam
Dh	Dewey cherty silty clay loam, eroded, undulating phase	Tp	Tyler fine sandy loam
Ed	Etowah loam, eroded, undulating phase	Ud	Udorthents
Ee	Etowah loam, undulating phase	Wa	Waynesboro clay loam, severely eroded, rolling phase

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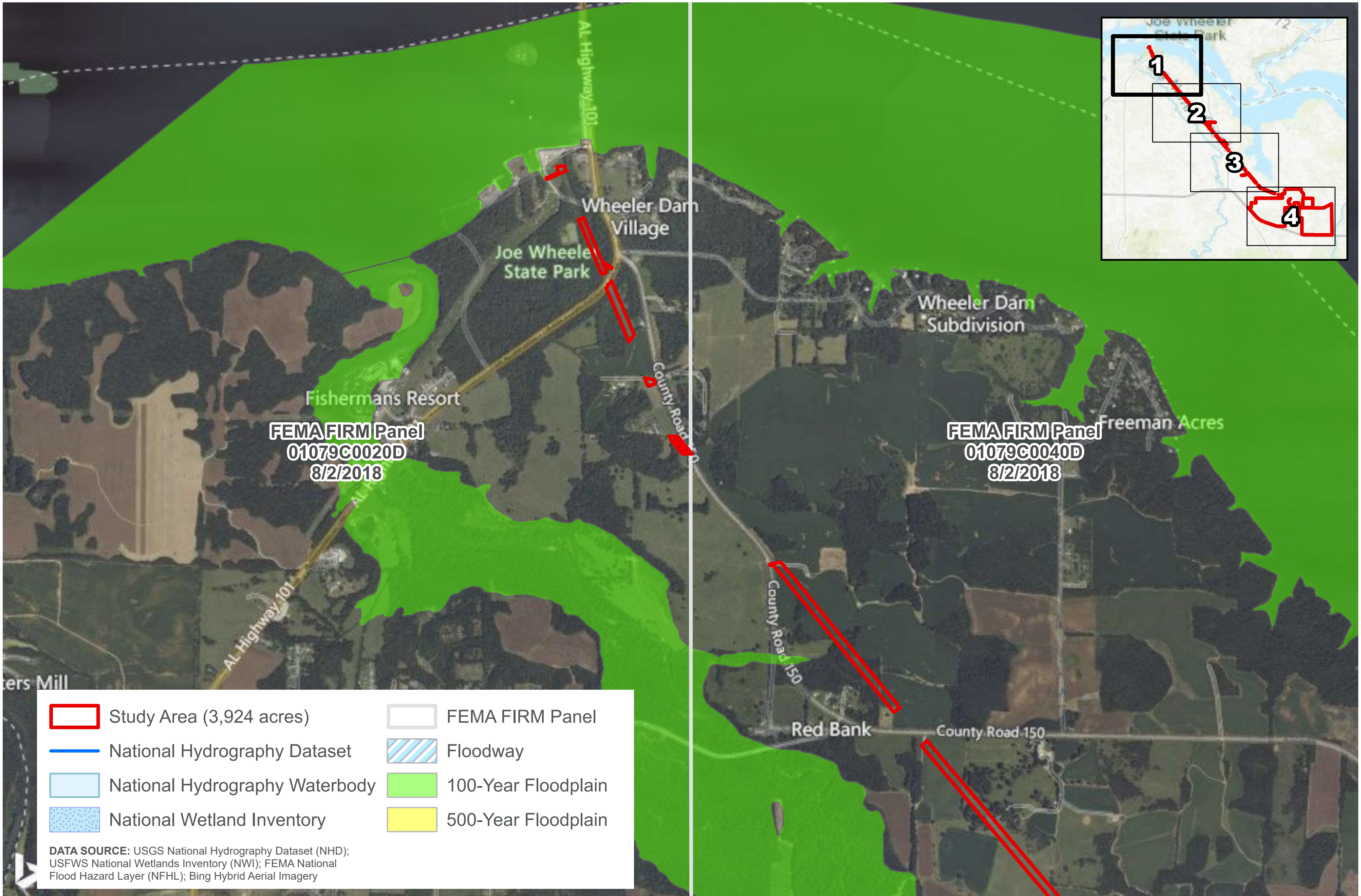
NRCS SOIL SURVEY OF LAWRENCE COUNTY, AL

FIGURE 5 - PAGE 4 OF 4



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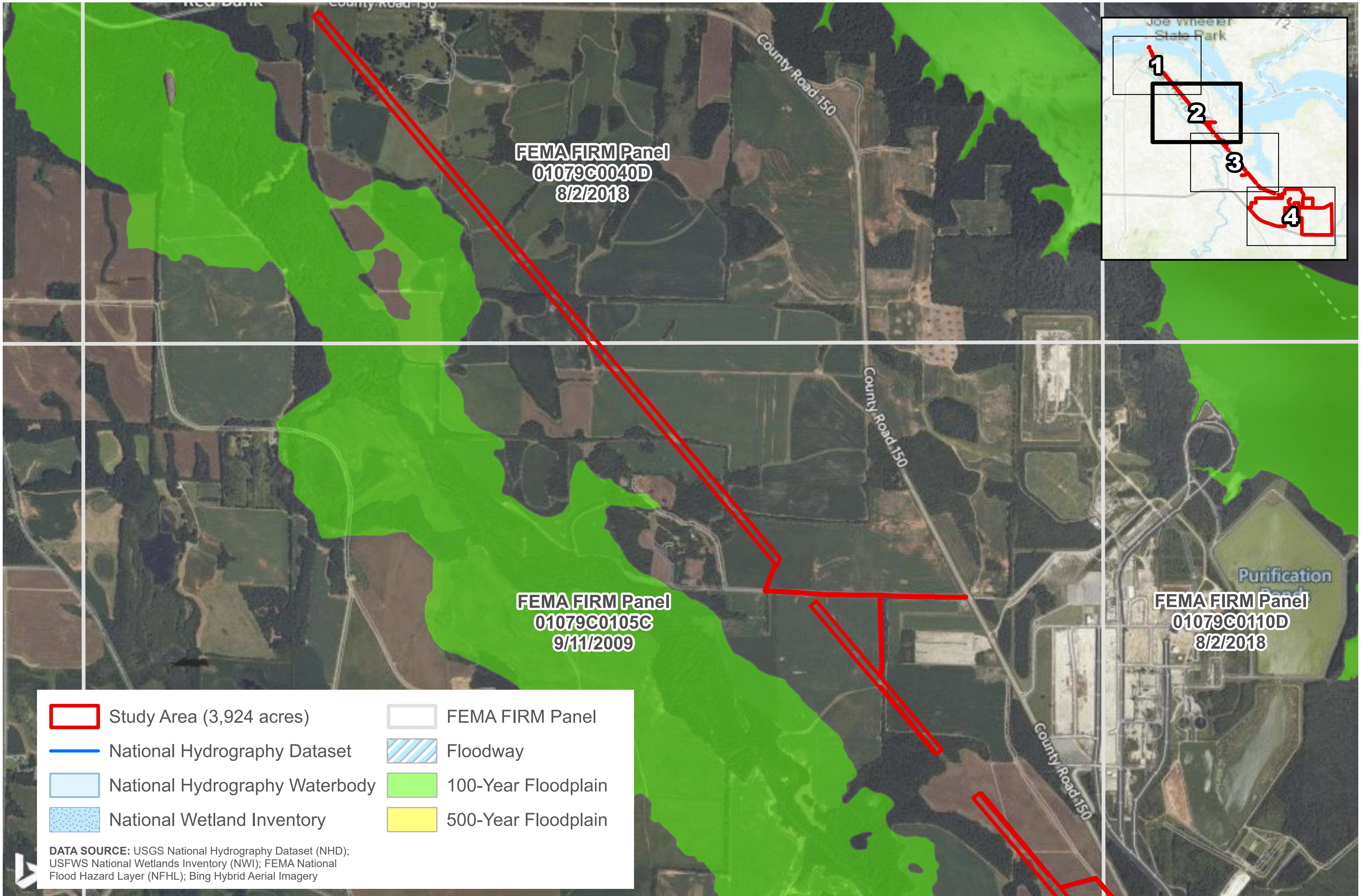
NHD, NWI, AND FEMA FLOOD ZONES

FIGURE 6 - PAGE 1 OF 4



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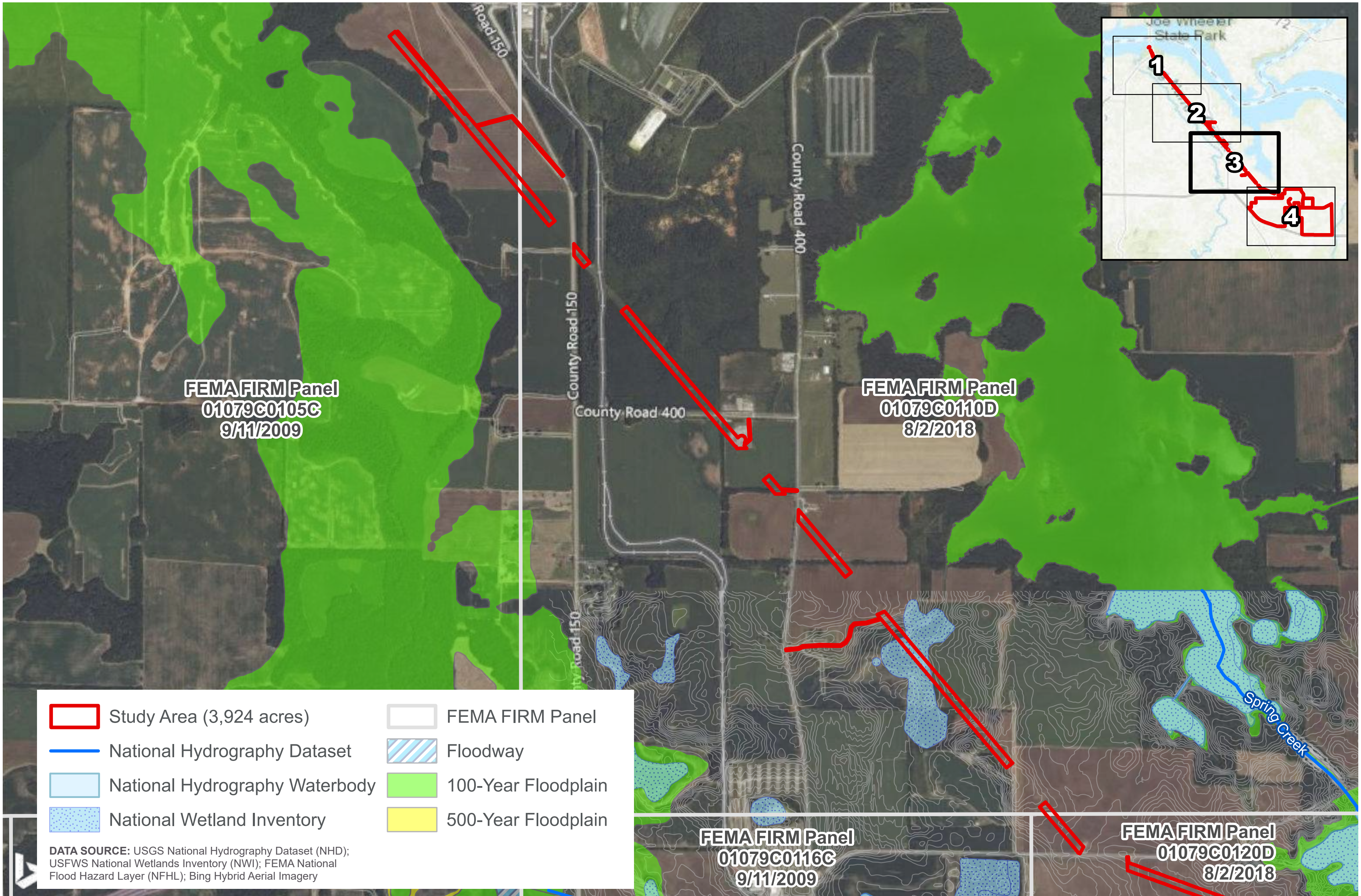
HILLSBORO SOLAR

NHD, NWI, AND FEMA FLOOD ZONES

FIGURE 6 - PAGE 2 OF 4

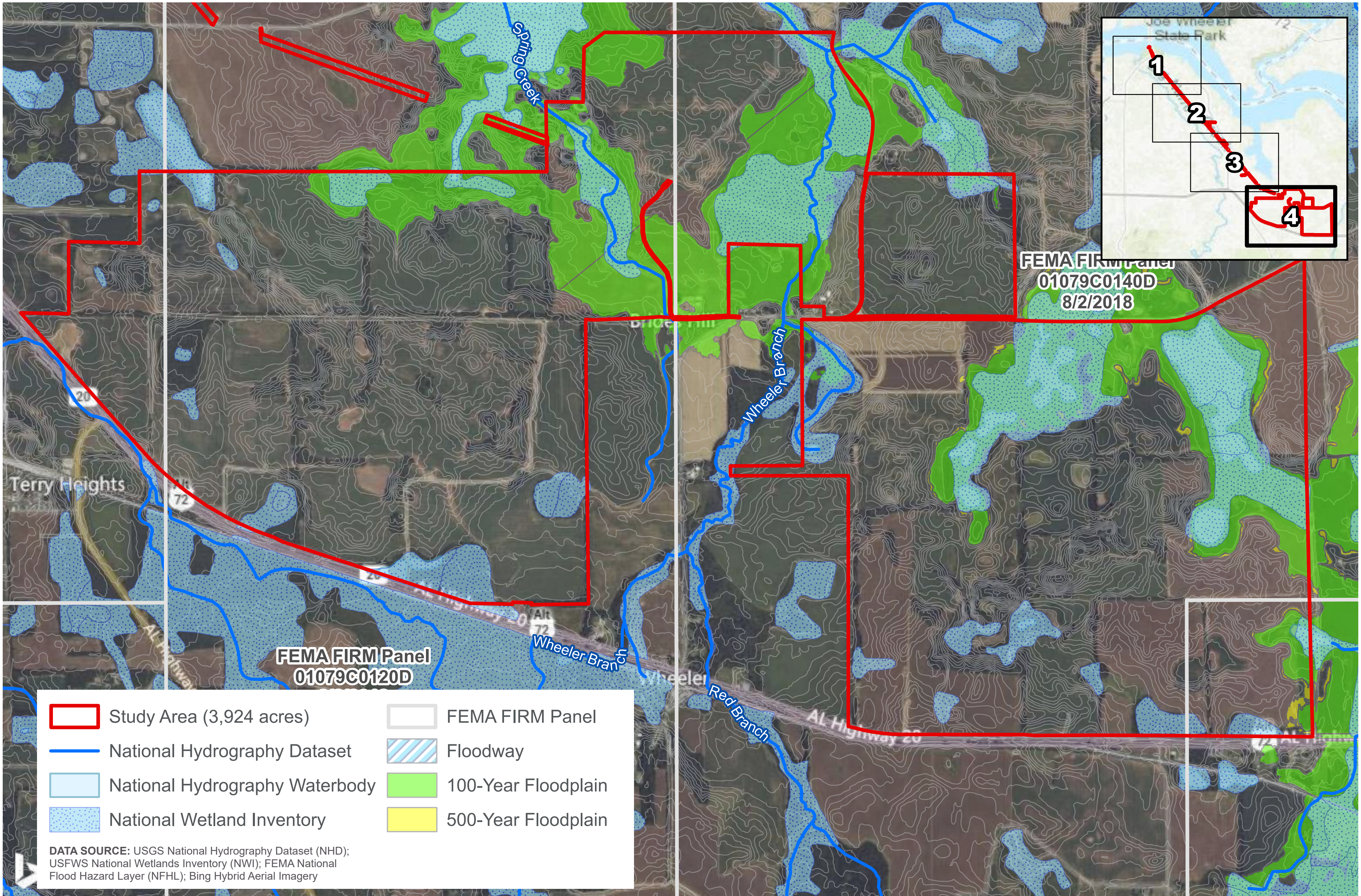


FDR URBAN GRID

HILLSBORO SOLAR

NHD, NWI, AND FEMA FLOOD ZONES

FIGURE 6 - PAGE 3 OF 4

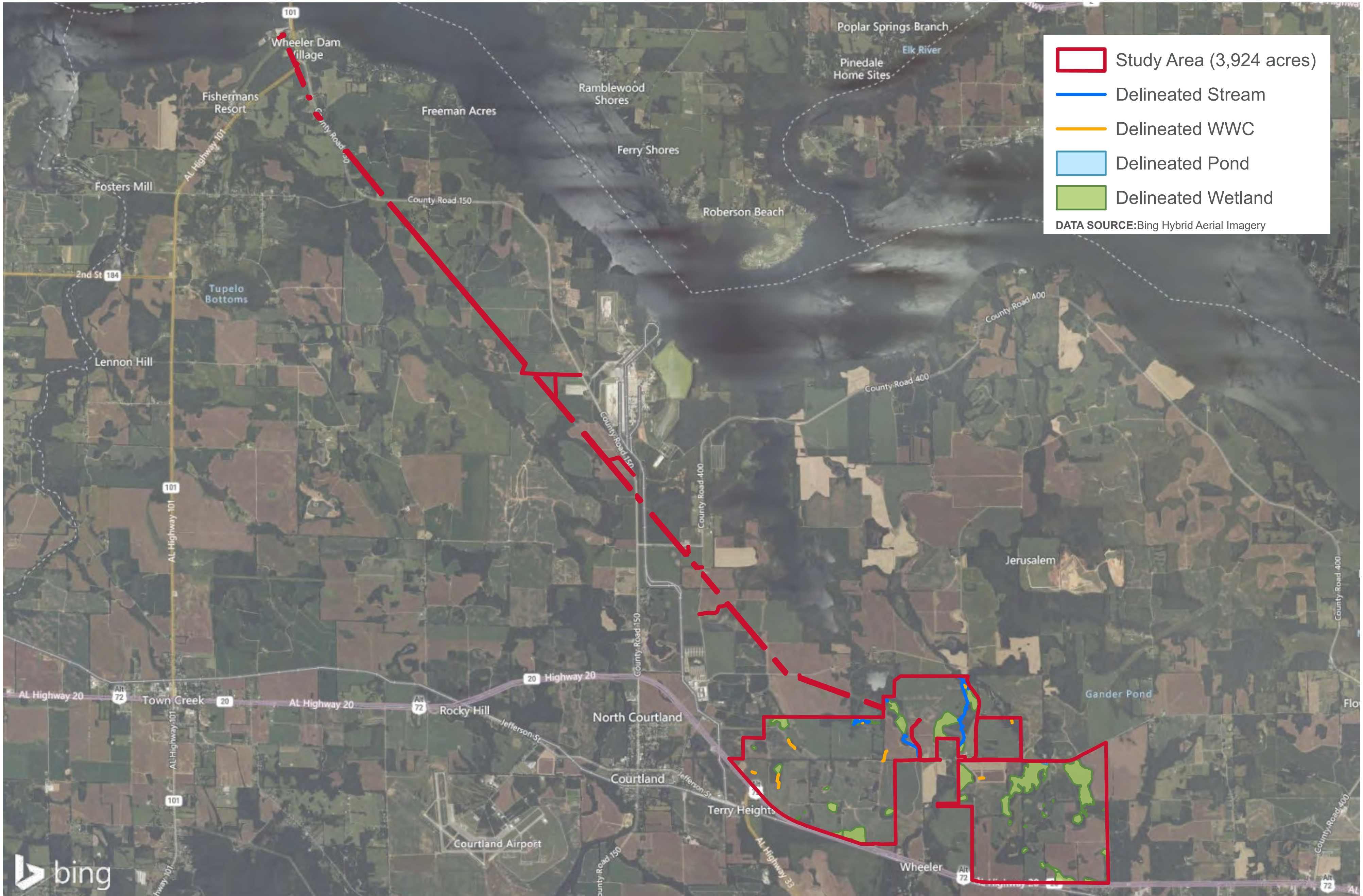


HDR URBAN GRID

HILLSBORO SOLAR

NHD, NWI, AND FEMA FLOOD ZONES

FIGURE 6 - PAGE 4 OF 4



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WETLAND AND STREAM DELINEATION OVERVIEW

FIGURE 7

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 5/28/2024

HILLSBORO SOLAR
WETLAND AND STREAM DELINEATION
FIGURE 7.1

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024

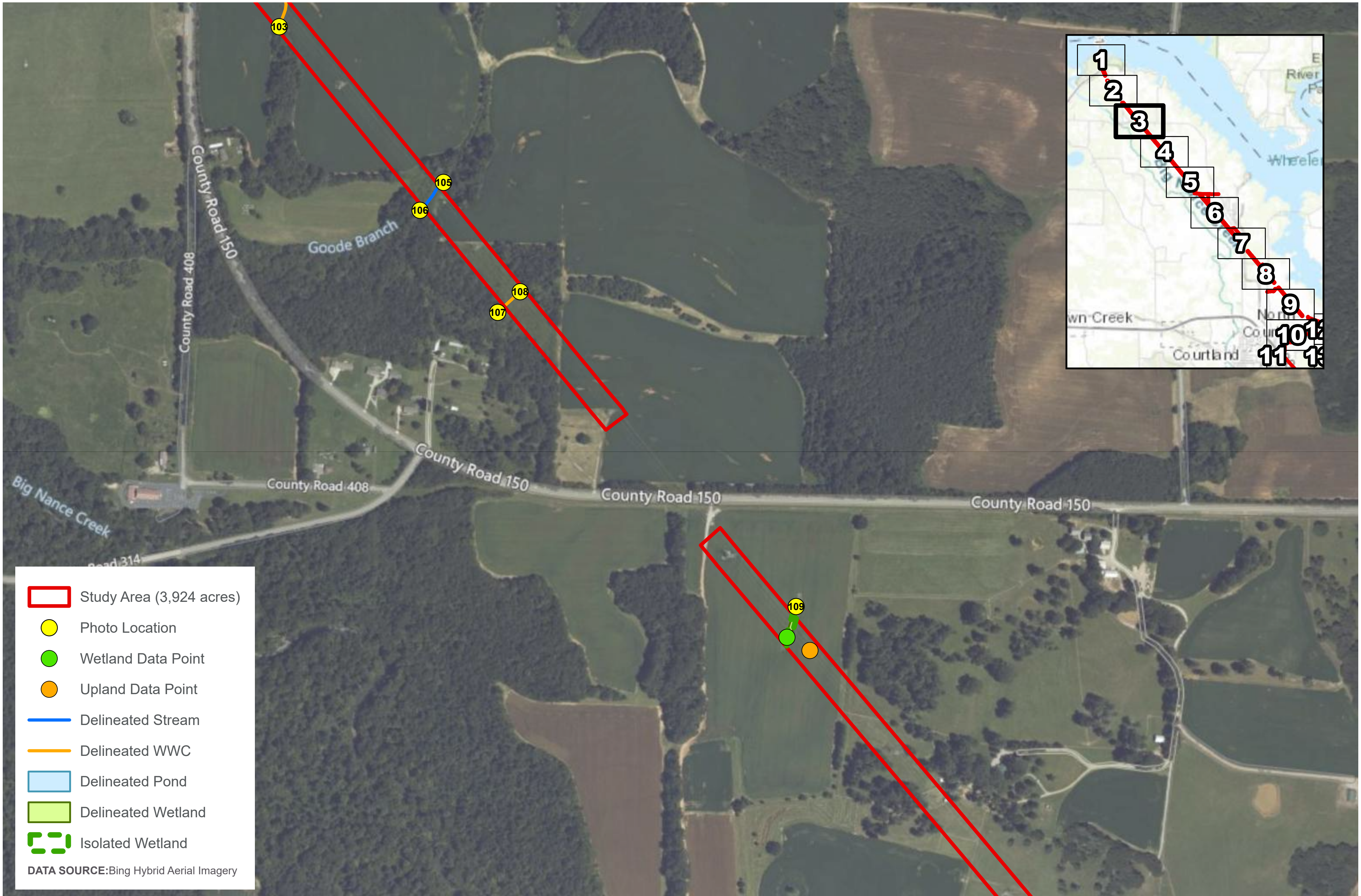
HDR URBANGRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.2

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.3

HDR URBAN GRID

0 700
Feet
N

HILLSBORO SOLAR

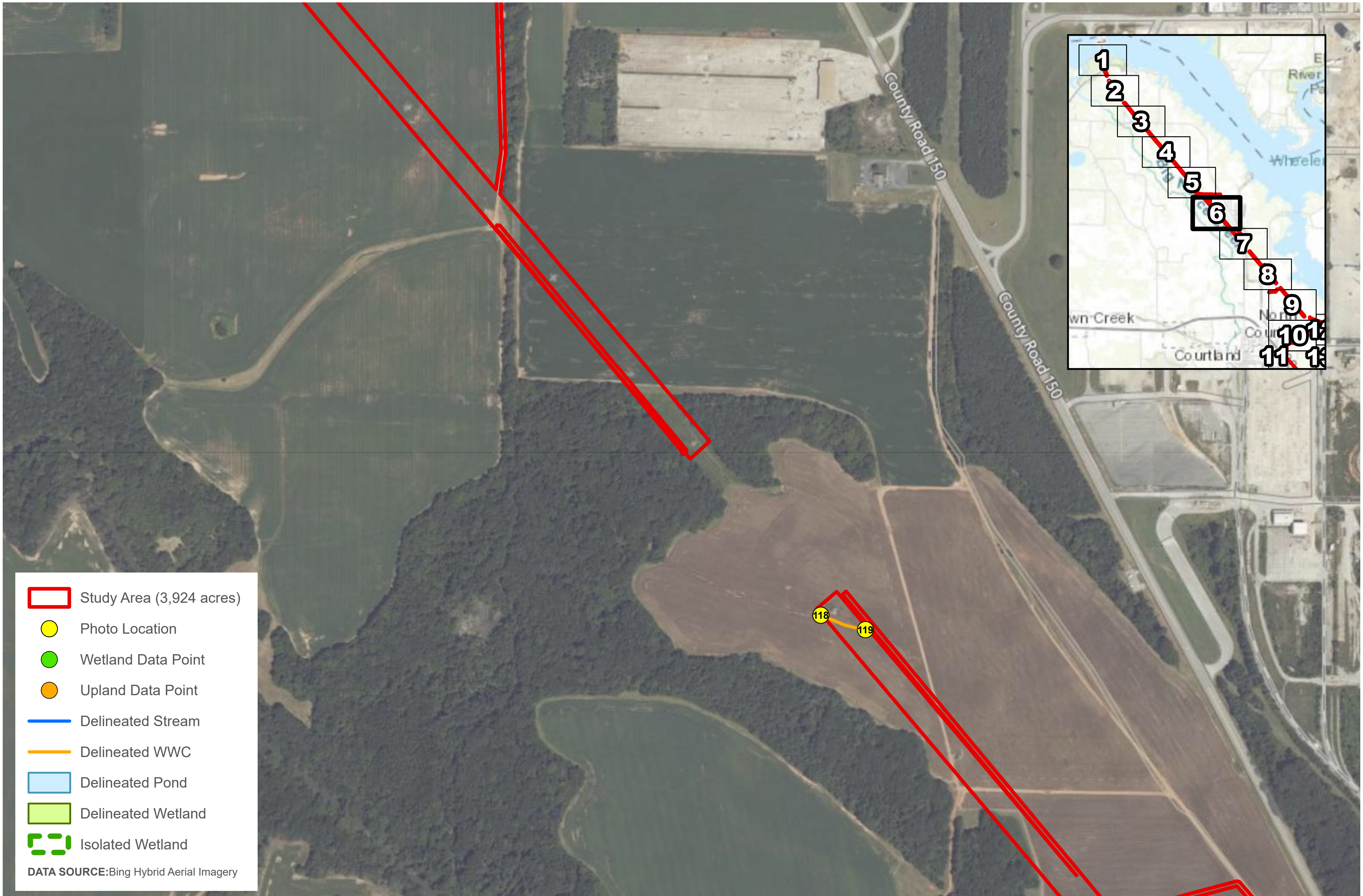
WETLAND AND STREAM DELINEATION

FIGURE 7.4

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024

HDR URBAN GRID

HILLSBORO SOLAR
WETLAND AND STREAM DELINEATION
FIGURE 7.5

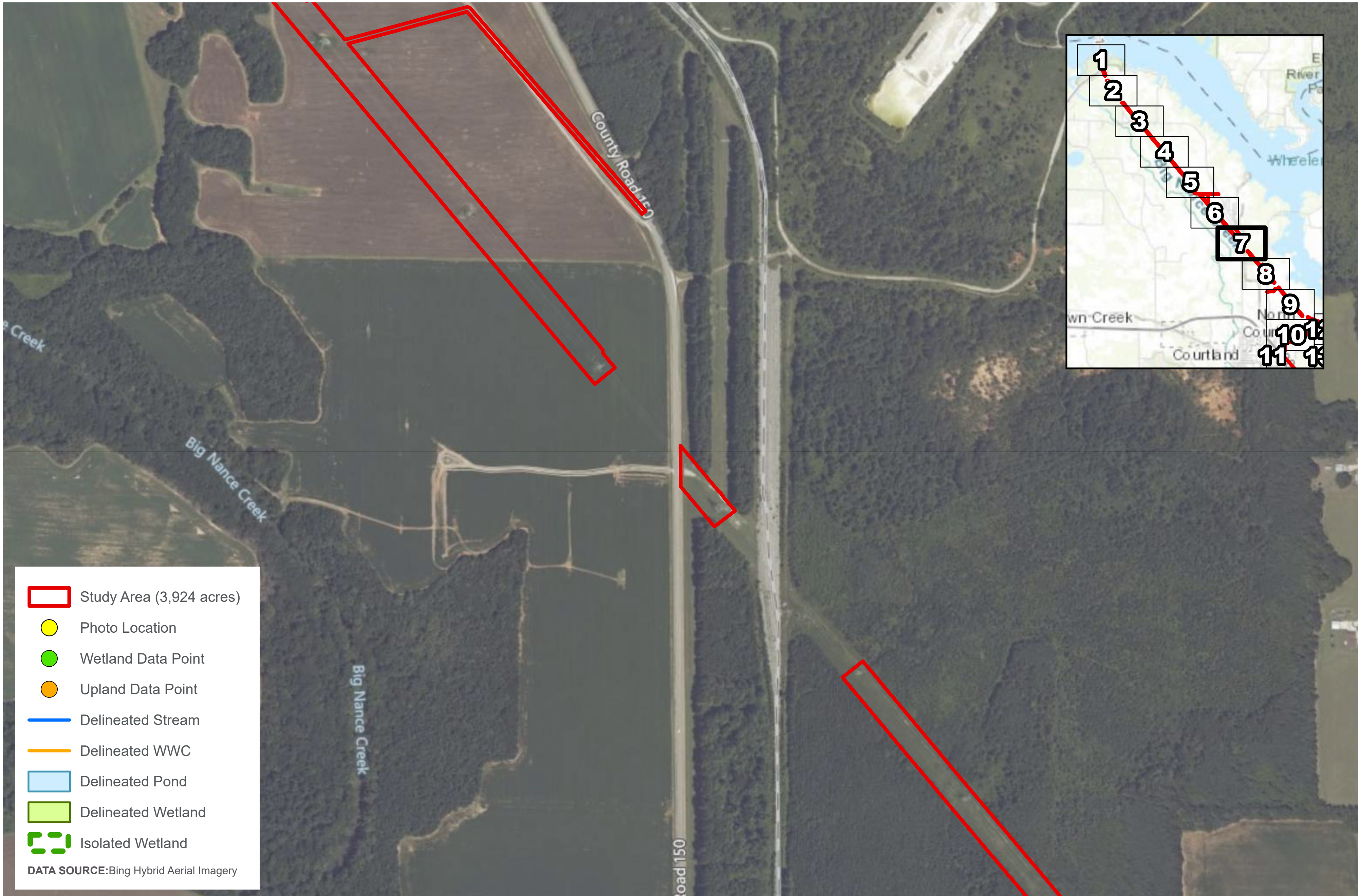


HDR URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.6



HDR URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.7

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024

HDR URBAN GRID

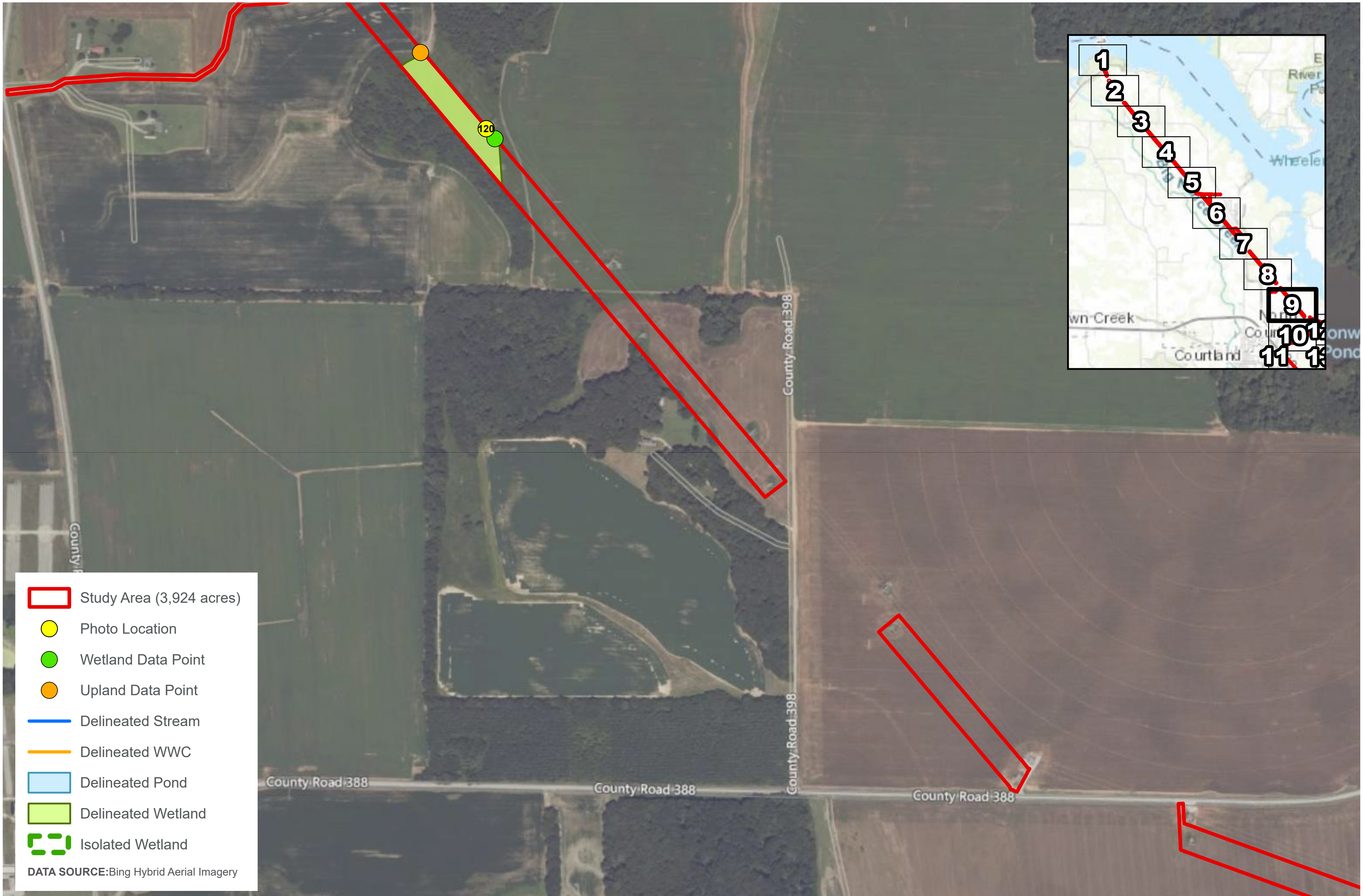
0 Feet 700 N

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.8

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



0 Feet 700

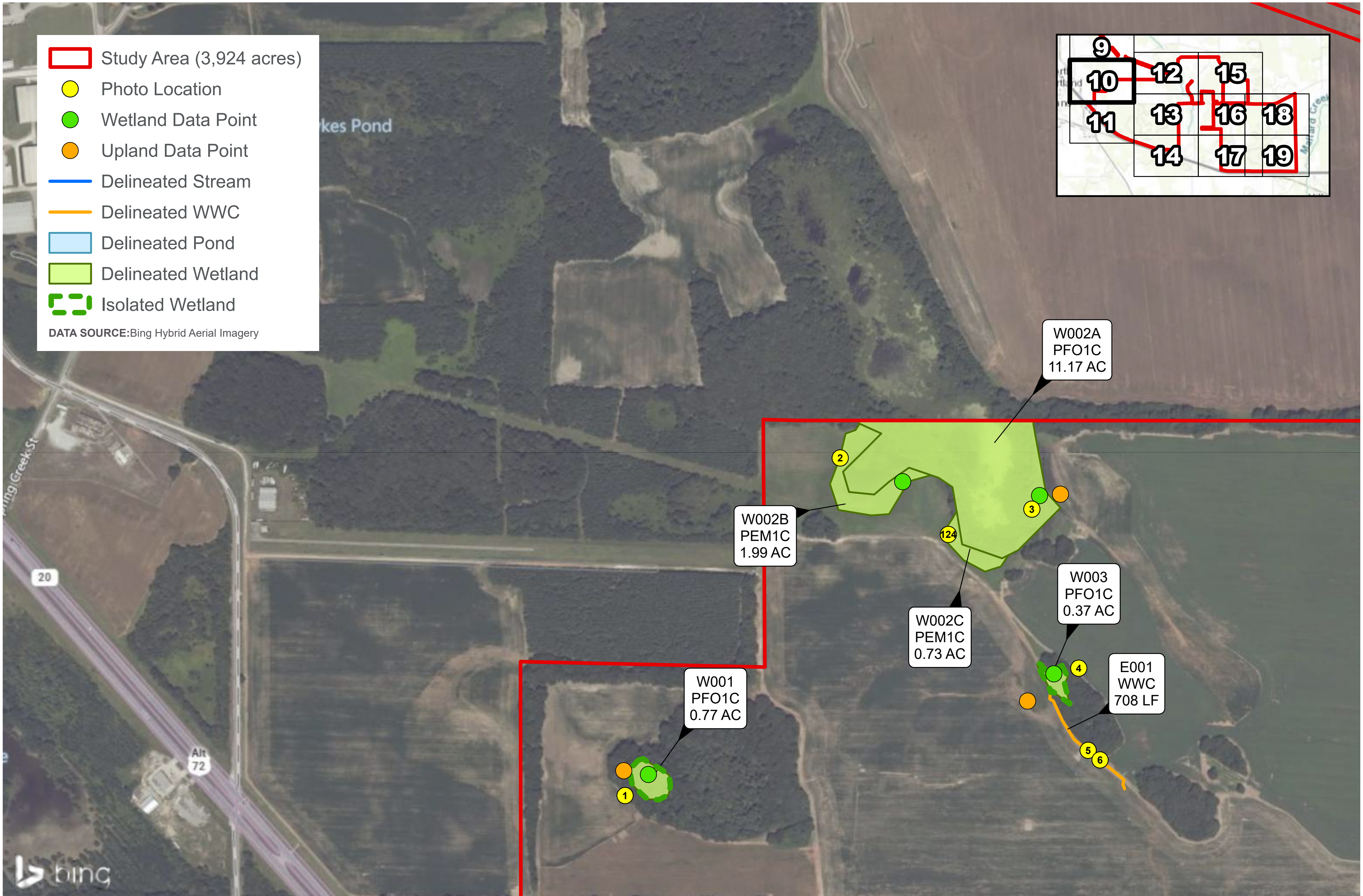
N

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.9

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

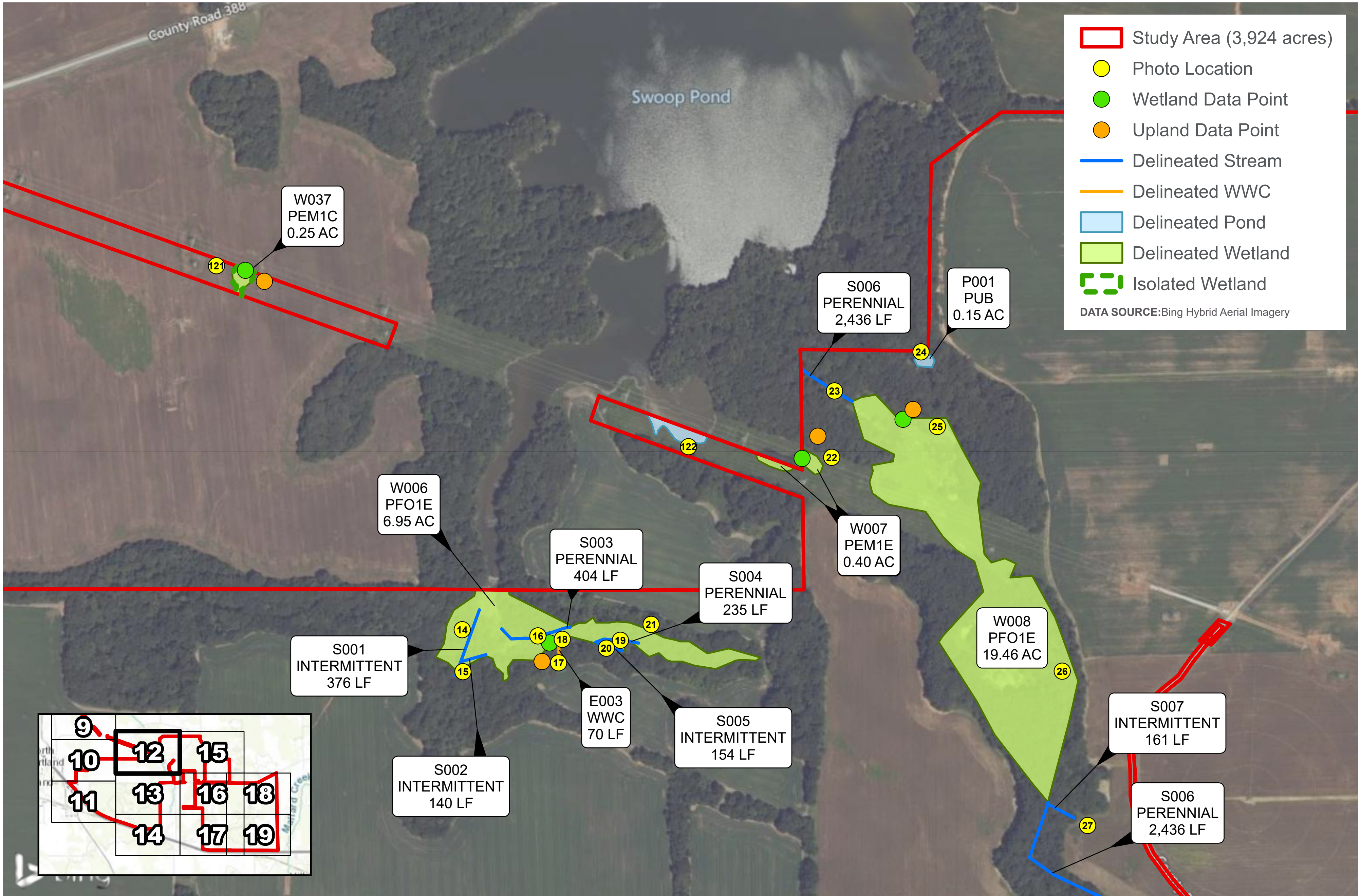
FIGURE 7.10

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.11

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



HDR

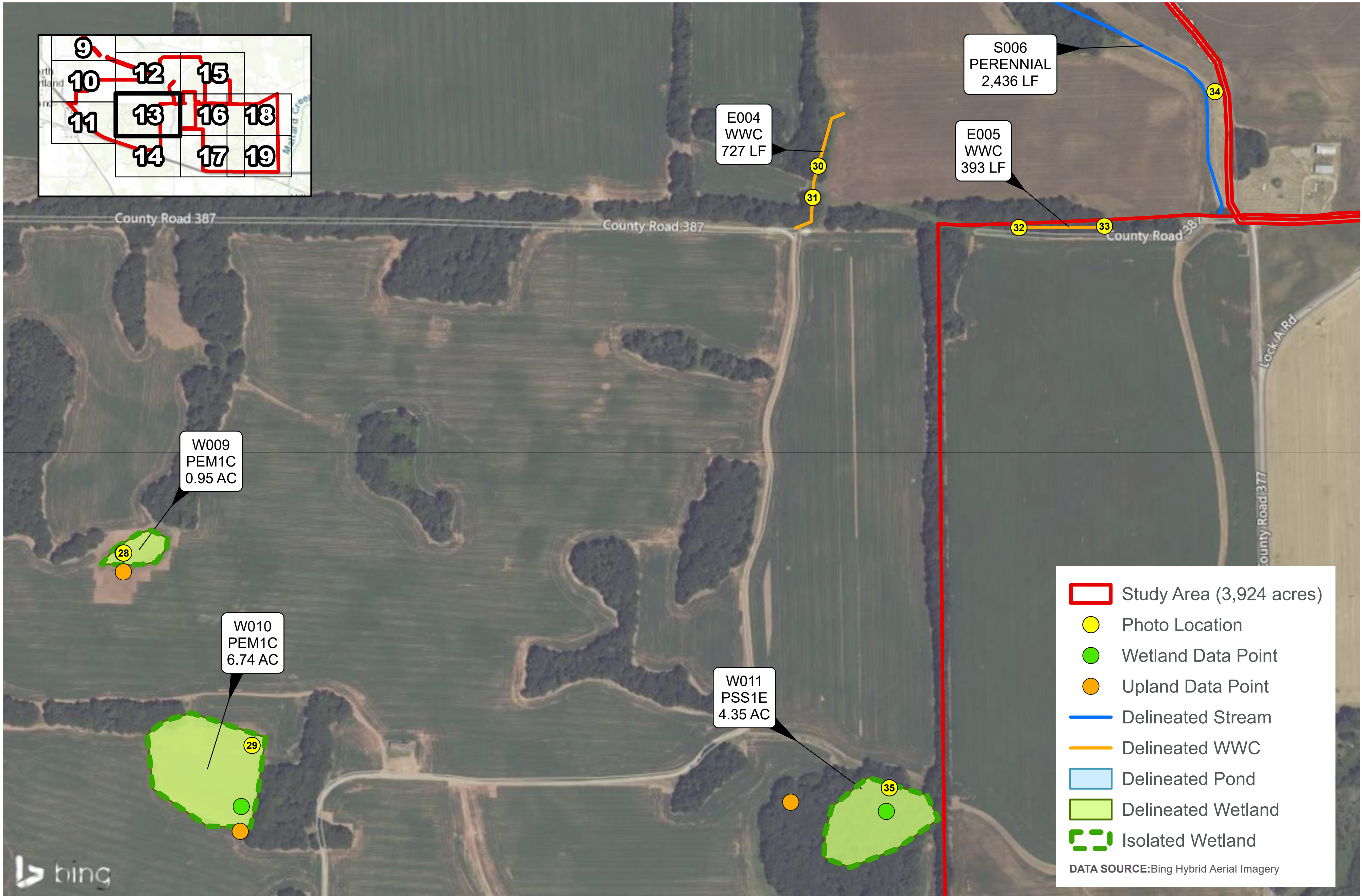
URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.12

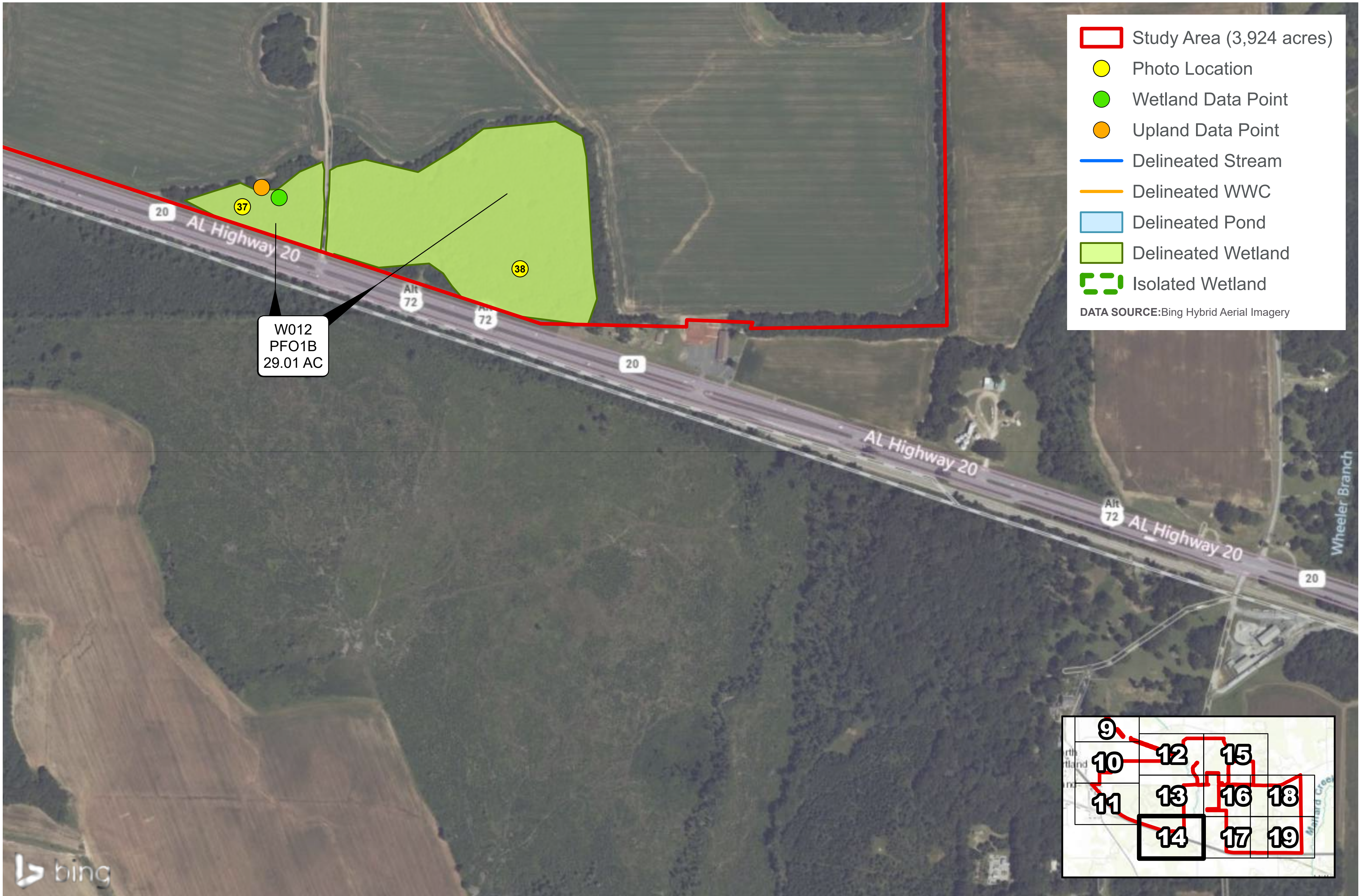
\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.13



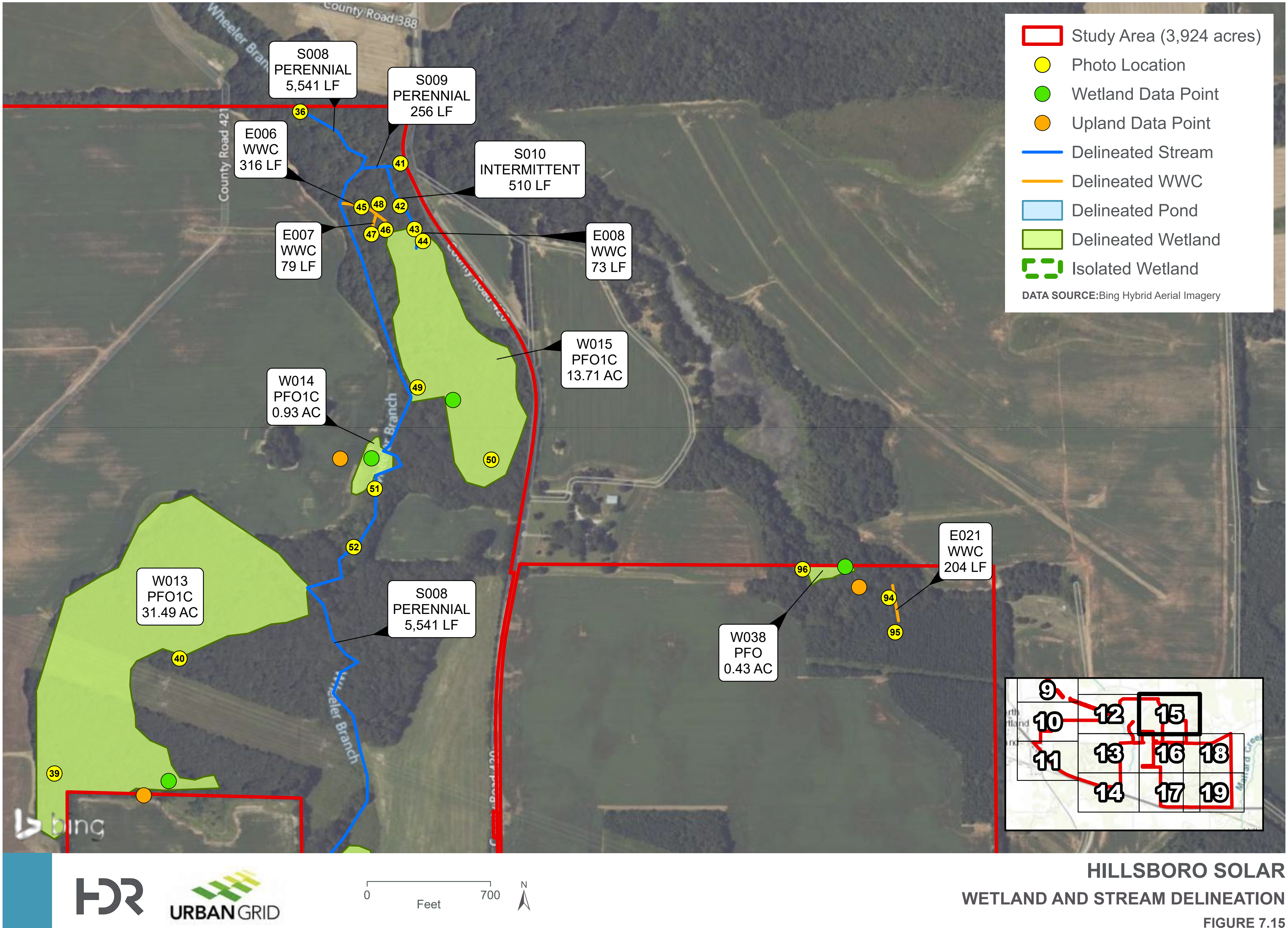
HDR URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.14

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



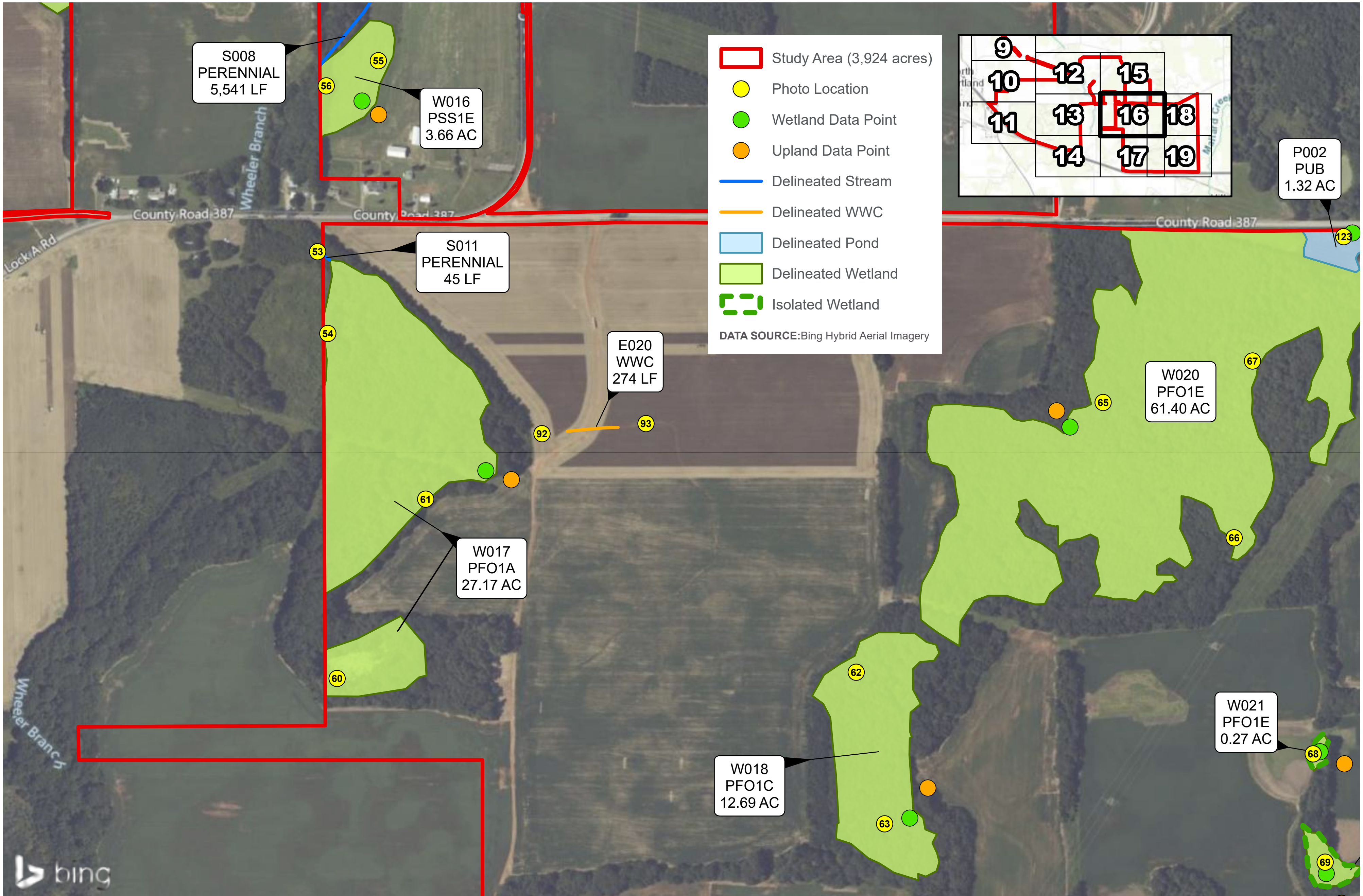
HDR URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.15

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



HDR URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.16

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024

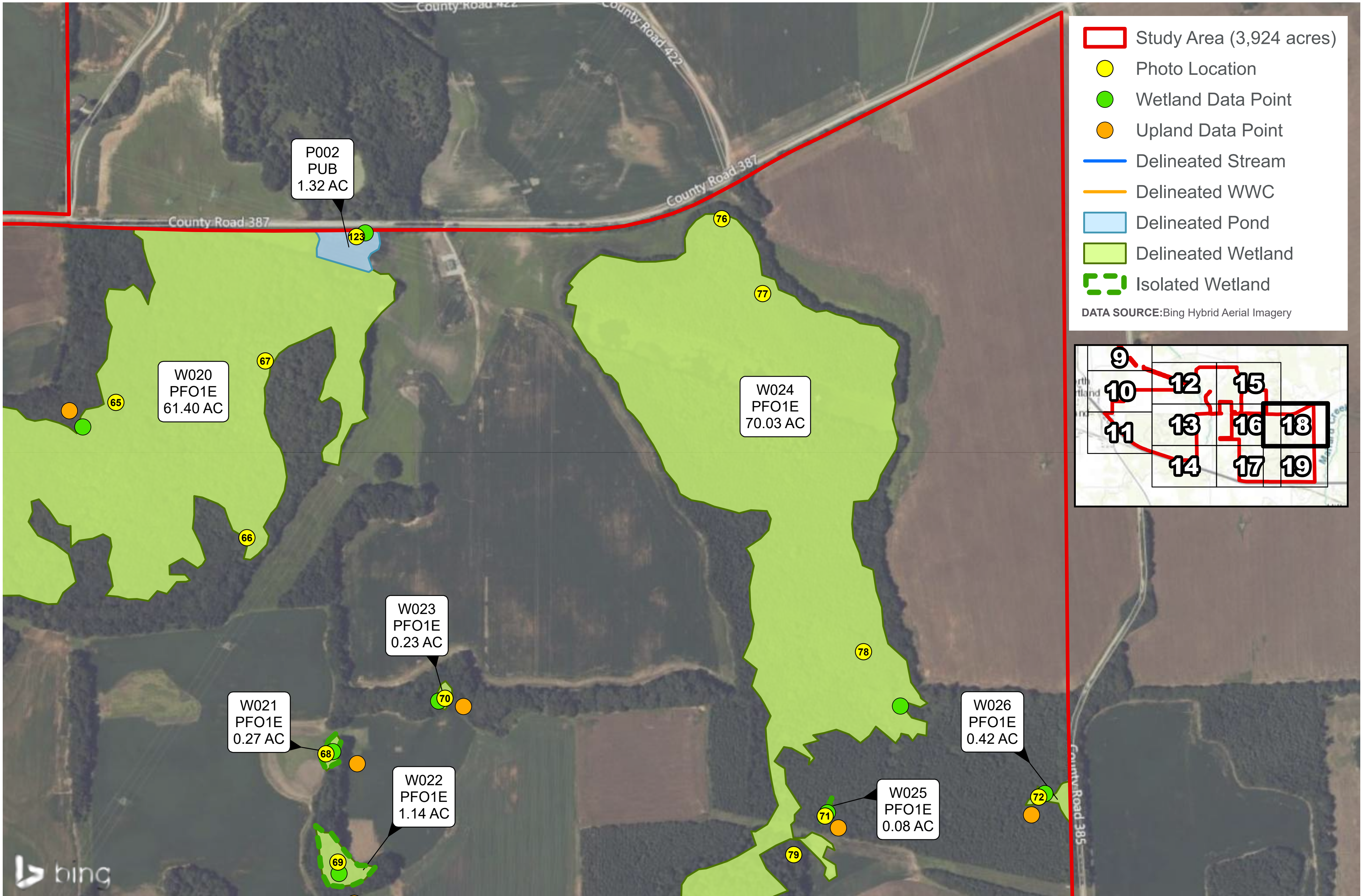
HDR URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.17

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024



HDR URBAN GRID

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.18

\\CLTSMAIN\GIS_DATA\GIS\PROJECTS\1197066_URBAN_GRID_SOLAR\10374212_HILLSBORO_SOLAR\7.2_WIP\MAP_DOCS\HILLSBOROSOLAR_TECHMEMO.APRX DATE: 7/10/2024

0 Feet 700

N

HILLSBORO SOLAR

WETLAND AND STREAM DELINEATION

FIGURE 7.19

B

Appendix B - Data Forms

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/7/2023

Applicant/Owner: Urban Grid State: AL Sampling Point: W001

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): Toe of Slope Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.672941 Long: -87.285334 Datum: NAD83

Soil Map Unit Name: Ad, Emory-Abernathy silt loams NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are “Normal Circumstances” present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes X	No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
This data point is representative of W001. Per the USACE’s antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Multiple heavy rain events within the past 7 days. No water present during the growing season. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Wetland 001 is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

____	Surface Water (A1)	____	True Aquatic Plants (B14)
____	High Water Table (A2)	____	Hydrogen Sulfide Odor (C1)
____	Saturation (A3)	____	Oxidized Rhizospheres on Living Roots (C3)
X	Water Marks (B1)	____	Presence of Reduced Iron (C4)
X	Sediment Deposits (B2)	____	Recent Iron Reduction in Tilled Soils (C6)
____	Drift Deposits (B3)	____	Thin Muck Surface (C7)
____	Algal Mat or Crust (B4)	____	Other (Explain in Remarks)
____	Iron Deposits (B5)		
____	Inundation Visible on Aerial Imagery (B7)		
X	Water-Stained Leaves (B9)		
____	Aquatic Fauna (B13)		

Secondary Indicators (minimum of two required)

____	Surface Soil Cracks (B6)
____	Sparsely Vegetated Concave Surface (B8)
X	Drainage Patterns (B10)
____	Moss Trim Lines (B16)
____	Dry-Season Water Table (C2)
____	Crayfish Burrows (C8)
____	Saturation Visible on Aerial Imagery (C9)
____	Stunted or Stressed Plants (D1)
____	Geomorphic Position (D2)
____	Shallow Aquitard (D3)
____	Microtopographic Relief (D4)
____	FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W001

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	15	Yes	FAC
2. *Liquidambar styraciflua*	12	Yes	FAC
3. *Celtis laevigata*	8	No	FACW
4. *Quercus falcata*	5	No	FACU
5. *Maclura pomifera*	5	No	UPL
6.			
7.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover: 9	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus rubra*	3	No	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	3	=Total Cover	
50% of total cover: 2		20% of total cover: 1	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	80	Yes	FAC
2. *Smilax rotundifolia*	30	Yes	FAC
3. *Toxicodendron radicans*	15	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	125	=Total Cover	
50% of total cover: 63		20% of total cover: 25	

Woody Vine Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	8	x 2 = 16
FAC species	152	x 3 = 456
FACU species	8	x 4 = 32
UPL species	5	x 5 = 25
Column Totals:	173 (A)	529 (B)

Prevalence Index = B/A = 3.06

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 4/6	100					Loamy/Clayey	
12-20	7.5YR 4/6	80	10YR 2/1	20	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/7/2023

Applicant/Owner: Urban Grid State: AL Sampling Point: W002a

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.676749 Long: -87.277989 Datum: NAD83

Soil Map Unit Name: Mb, Tyler and Monongahela fine sandy loams, eroded, undulating phase NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ significantly disturbed? Are “Normal Circumstances” present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present? Yes X No ____		
Wetland Hydrology Present? Yes X No ____		

Remarks:
This data point is representative of W002. Per the USACE’s antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
		____ Surface Soil Cracks (B6)
____ Surface Water (A1)	____ True Aquatic Plants (B14)	____ Sparsely Vegetated Concave Surface (B8)
____ High Water Table (A2)	____ Hydrogen Sulfide Odor (C1)	X Drainage Patterns (B10)
____ Saturation (A3)	____ Oxidized Rhizospheres on Living Roots (C3)	____ Moss Trim Lines (B16)
____ Water Marks (B1)	____ Presence of Reduced Iron (C4)	____ Dry-Season Water Table (C2)
X Sediment Deposits (B2)	____ Recent Iron Reduction in Tilled Soils (C6)	____ Crayfish Burrows (C8)
____ Drift Deposits (B3)	____ Thin Muck Surface (C7)	X Saturation Visible on Aerial Imagery (C9)
____ Algal Mat or Crust (B4)	____ Other (Explain in Remarks)	____ Stunted or Stressed Plants (D1)
____ Iron Deposits (B5)		X Geomorphic Position (D2)
____ Inundation Visible on Aerial Imagery (B7)		____ Shallow Aquitard (D3)
X Water-Stained Leaves (B9)		____ Microtopographic Relief (D4)
X Aquatic Fauna (B13)		X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____	
Water Table Present?	Yes ____	No X	Depth (inches): ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____	**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W002a

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	5	Yes	FACW
2. *Quercus lyrata*	3	Yes	OBL
3.			
4.			
5.			
6.			
7.			
	8	=Total Cover	
50% of total cover: 4		20% of total cover:	2
Sapling/Shrub Stratum (Plot size: 30)			
1. *Cephalanthus occidentalis*	40	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8
Herb Stratum (Plot size: 30)			
1. *Campsis radicans*	40	Yes	FAC
2. *Cicuta maculata*	30	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	20	Yes	FAC
2. *Campsis radicans*	15	Yes	FAC
3. *Brunnichia ovata*	15	Yes	FACW
4.			
5.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	73	x 1 =	73
FACW species	20	x 2 =	40
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	168 (A)		338 (B)

Prevalence Index = B/A = 2.01

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W002a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 4/2	90	7.5YR 4/6	10	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W002a
Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____
Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 2-10
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.676915 Long: -87.277556 Datum: NAD 83
Soil Map Unit Name: Monongahela and Holston fine sandy loams, eroded, undulating phase NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W002. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W002a

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Glycine max*	15	Yes	UPL
2. *Solidago altissima*	15	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover:	15	20% of total cover:	6

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	15	x 5 =	75
Column Totals:	30 (A)		135 (B)

Prevalence Index = B/A = 4.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W002a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	5YR 4/6	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-xxxx, Exp: Pending*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/7/2023

Applicant/Owner: Urban Grid State: AL Sampling Point: W002b

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.677211 Long: -87.280233 Datum: NAD83

Soil Map Unit Name: Mb, Tyler and Monongahela fine sandy loams, eroded, undulating phase NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X No ____		

Remarks:
This data form is representative of a review of W002. Soil disturbance is due to this feature being at the edge of a corn field. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)	
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)	
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)	
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)	
X Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)	
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)	
___ Iron Deposits (B5)		
___ Inundation Visible on Aerial Imagery (B7)		
___ Water-Stained Leaves (B9)		
___ Aquatic Fauna (B13)		

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____	
Water Table Present?	Yes ____	No X	Depth (inches): ____	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____	**Wetland Hydrology Present? Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W002b

Tree Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ludwigia palustris*	70	Yes	OBL
2. *Xanthium strumarium*	20	No	FAC
3. *Campsis radicans*	8	No	FAC
4. *Helenium autumnale*	8	No	FACW
5. *Carex intumescens*	5	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	111	=Total Cover	
50% of total cover:	56	20% of total cover:	23

Woody Vine Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	13	x 2 =	26
FAC species	28	x 3 =	84
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	111 (A)		180 (B)

Prevalence Index = B/A = 1.62

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W002b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 4/6	100					Loamy/Clayey	disturbed soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X **No** ___

Remarks:
This area is at the edge of a corn field and has disturbed soils.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/10/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W002b - Up

Investigator(s): Paul Bright, Ethan Lawton Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.677079 Long: -87.280229 Datum: NAD 83

Soil Map Unit Name: Monongahela and Holston fine sandy loams, eroded, undulating phase NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W002b. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___	
Water Table Present?	Yes ___	No X	Depth (inches): ___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___	**Wetland Hydrology Present? Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W002b - Up

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Glycine max*	75	Yes	UPL
2. *Solidago altissima*	10	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	=Total Cover	
50% of total cover:	43	20% of total cover:	17

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	75	x 5 =	375
Column Totals:	85 (A)		415 (B)

Prevalence Index = B/A = 4.88

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W002b - Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-20	5YR 4/6	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/7/2023

Applicant/Owner: Urban Grid State: AL Sampling Point: W002c - Wet

Investigator(s): Paul Bright Section, Township, Range: ______

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.676202 Long: -87.279317 Datum: NAD83

Soil Map Unit Name: Etowah loam, eroded, undulating phase NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data form is representative of a review of W002c. Soil disturbance is due to this feature being at the edge of a soybean field. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 1
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W002c - Wet

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	=Total Cover		
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 30)			
1. *Ludwigia palustris*	20	Yes	OBL
2. *Xanthium strumarium*	5	No	FAC
3. *Carex intumescens*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30 =Total Cover		
50% of total cover: 15		20% of total cover:	6

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	30 (A)		45 (B)

Prevalence Index = B/A = 1.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W002c - Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 4/6	100					Loamy/Clayey	disturbed soils
8-20	10YR 4/2	90	10YR 4/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:
This area is at the edge of a soybean field and has disturbed soils.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/10/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W002c - Up

Investigator(s): Paul Bright, Ethan Lawton Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.676139 Long: -87.279479 Datum: NAD 83

Soil Map Unit Name: Etowah loam, eroded, undulating phase NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This data point is representative of uplands adjacent to W002c. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W002c - Up

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Glycine max*	75	Yes	UPL
2. *Solidago altissima*	8	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	83	=Total Cover	
50% of total cover:	42	20% of total cover:	17

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	8	x 4 =	32
UPL species	75	x 5 =	375
Column Totals:	83 (A)		407 (B)

Prevalence Index = B/A = 4.90

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W002c - Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	5YR 4/6	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/7/2023
Applicant/Owner: Urban Grid State: AL Sampling Point: W003
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.674252 Long: -87.277644 Datum: NAD83
Soil Map Unit Name: Ooltewah silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W003. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Wetland 003 is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)	___ True Aquatic Plants (B14)
X High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
X Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
X Water Marks (B1)	___ Presence of Reduced Iron (C4)
X Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
X Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 6
Water Table Present?	Yes X	No ___	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W003

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis laevigata*	40	Yes	FACW
2. *Quercus phellos*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	50	=Total Cover	
50% of total cover:	25	20% of total cover:	10

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis laevigata*	20	Yes	FACW
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Ligustrum sinense*	2	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	32	=Total Cover	
50% of total cover:	16	20% of total cover:	7

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover:	15	20% of total cover:	6

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	8	Yes	FAC
2.			
3.			
4.			
5.			
	8	=Total Cover	
50% of total cover:	4	20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	48	x 3 =	144
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	120 (A)		292 (B)

Prevalence Index = B/A = 2.43

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W003

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Area has accumulated soil runoff from adjacent agricultural field.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/7/2023
Applicant/Owner: Urban Grid State: AL Sampling Point: W004
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.669831 Long: -87.279758 Datum: NAD83
Soil Map Unit Name: Ooltewah silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation X , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X No ____		

Remarks:
This data point is representative of W004. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. This wetland was recently cleared-cut. Wetland 004 is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
X Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W004

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	2	No	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover:	1
Sapling/Shrub Stratum (Plot size: 30)			
1. *Fraxinus pennsylvanica*	40	Yes	FACW
2. *Ulmus americana*	5	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9
Herb Stratum (Plot size: 30)			
1. *Persicaria pensylvanica*	60	Yes	FACW
2. *Epilobium angustifolium*	15	No	FAC
3. *Juncus effusus*	10	No	FACW
4. *Typha latifolia*	2	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	87	=Total Cover	
50% of total cover: 44		20% of total cover:	18
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	117	x 2 =	234
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	134 (A)		281 (B)

Prevalence Index = B/A = 2.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W004

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-1	7.5YR 4/3	90	7.5YR 4/6	10	C	M	Loamy/Clayey	
1-20	7.5YR 4/2	90	7.5YR 4/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/7/2023

Applicant/Owner: Urban Grid State: AL Sampling Point: W005a

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661736 Long: -87.274283 Datum: NAD83

Soil Map Unit Name: Ooltewah silt loam NWI classification: PUB

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
This data point is representative of W005 located within an agricultral field. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Wetland has been disturbed by agricultural activities and does not have a connection to a WOTUS, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)	___ True Aquatic Plants (B14)
X High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
X Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
X Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	X Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
X Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 6
Water Table Present?	Yes X	No ____	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W005a

Tree Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
=Total Cover			

50% of total cover: ____ 20% of total cover: ____

Sapling/Shrub Stratum (Plot size: 15)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
=Total Cover			

50% of total cover: ____ 20% of total cover: ____

Herb Stratum (Plot size: 5)

	Absolute % Cover	Dominant Species?	Indicator Status
1. *Persicaria pensylvanica*	90	Yes	FACW
2. *Ludwigia palustris*	25	No	OBL
3. *Eleocharis obtusa*	10	No	OBL
4. *Glycine max*	1	No	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
=Total Cover	126		

50% of total cover: 63 20% of total cover: 26

Woody Vine Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
=Total Cover			

50% of total cover: ____ 20% of total cover: ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	1	x 5 =	5
Column Totals:	126 (A)		220 (B)

Prevalence Index = B/A = 1.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W005a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-15	10YR 4/1	70	7.5YR 4/6	30	C	M	Loamy/Clayey	
15-20	10YR 5/1	60	7.5YR 4/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/8/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W005a

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661575 Long: -87.274544 Datum: NAD83

Soil Map Unit Name: Ooltewah silt loam NWI classification: PUB

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X		
Wetland Hydrology Present?	Yes ___	No X		

Remarks:
This data point is representative of uplands adjacent to W005. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W005a

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Glycine max*	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W005a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	98	7.5YR 4/6	2	C	M	Loamy/Clayey	
4-12	10YR 4/2	70	7.5YR 4/6	30	C	M	Loamy/Clayey	
12-20	10YR 4/3	60	7.5YR 3/4	40	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/11/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W006
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.677120 Long: -87.262375 Datum: NAD83
Soil Map Unit Name: Lindside silty clay loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ___
Hydric Soil Present? Yes X No ___		
Wetland Hydrology Present? Yes X No ___		

Remarks:
This data point is representative of W006. Climatic/hydrologic conditions were normal as determined by the Antecedent Pricipitation Tool.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)	___ True Aquatic Plants (B14)	
X High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)	
X Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)	
X Water Marks (B1)	___ Presence of Reduced Iron (C4)	
X Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)	
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)	
___ Iron Deposits (B5)		
___ Inundation Visible on Aerial Imagery (B7)		
X Water-Stained Leaves (B9)		
X Aquatic Fauna (B13)		

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes X	No ___	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W006

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	30	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	20	Yes	OBL
2. *Sambucus nigra*	20	Yes	FAC
3. *Ligustrum sinense*	10	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Persicaria pensylvanica*	15	Yes	FACW
2. *Boehmeria cylindrica*	10	Yes	FACW
3. *Impatiens capensis*	10	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	35	x 2 =	70
FAC species	40	x 3 =	120
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	135 (A)		280 (B)

Prevalence Index = B/A = 2.07

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is dominant.

SOIL

Sampling Point: W006

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/1	95	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
4-20	10YR 4/2	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/11/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W006

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): none Slope (%): 2-3

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.677087 Long: -87.262291 Datum: NAD83

Soil Map Unit Name: Baxter (Fullerton) gravelly silt loam, 6 to 12 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:
This data point is representative of uplands adjacent to W006. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W006

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Maclura pomifera*	25	Yes	UPL
2. *Celtis occidentalis*	10	Yes	FACU
3. *Acer rubrum*	5	No	FAC
4.			
5.			
6.			
7.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	50	Yes	FACU
2. *Celtis occidentalis*	3	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	53	=Total Cover	
50% of total cover: 27		20% of total cover:	11

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Polystichum acrostichoides*	10	Yes	FACU
2. *Ligustrum sinense*	10	Yes	FACU
3. *Boehmeria cylindrica*	2	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	22	=Total Cover	
50% of total cover: 11		20% of total cover:	5

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	30	Yes	FAC
2. *Parthenocissus quinquefolia*	10	Yes	FACU
3.			
4.			
5.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	35	x 3 =	105
FACU species	93	x 4 =	372
UPL species	25	x 5 =	125
Column Totals:	155 (A)		606 (B)

Prevalence Index = B/A = 3.91

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W006

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Loamy/Clayey	
6-20	10YR 4/3	90	10YR 4/6	10	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W007
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): toe of slope Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.679930 Long: -87.257784 Datum: NAD83
Soil Map Unit Name: Ooltewah silt loam NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
This data point is representative of W007. Climatic/hydrologic conditions were normal as determined by the Antecedent Pricipitation Tool.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- ____ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes X No X Depth (inches): 1
Saturation Present? Yes X No X Depth (inches): 0
(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W007

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cephalanthus occidentalis*	25	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	25	=Total Cover	
50% of total cover:	13	20% of total cover:	5

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Persicaria pensylvanica*	70	Yes	FACW
2. *Eleocharis obtusa*	60	Yes	OBL
3. *Scirpus georgianus*	8	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	138	=Total Cover	
50% of total cover:	69	20% of total cover:	28

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	93	x 1 =	93
FACW species	70	x 2 =	140
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	163 (A)		233 (B)

Prevalence Index = B/A = 1.43

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is dominant.

SOIL

Sampling Point: W007

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/2	90	7.5YR 4/6	10	C	M	Loamy/Clayey	Prominent redox concentrations
4-20	7.5YR 4/3	90	7.5YR 4/6	10	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W007
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): none Slope (%): 3-4
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.680144 Long: -87.257745 Datum: NAD83
Soil Map Unit Name: Baxter (Fullerton) gravelly silt loam, 6 to 12 percent slopes, eroded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No	
Hydrophytic Vegetation Present?		X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?		X	
Wetland Hydrology Present?		X	

Remarks:
This data point is representative of uplands adjacent to W007. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		X	
Water Table Present?		X	
Saturation Present? (includes capillary fringe)		X	

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W007

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lespedeza cuneata*	40	Yes	FACU
2. *Rubus argutus*	40	Yes	FACU
3. *Chamaecrista nictitans*	40	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	120	=Total Cover	
50% of total cover:	60	20% of total cover:	24

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover:	5	20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	10	x 3 = 30
FACU species	120	x 4 = 480
UPL species	0	x 5 = 0
Column Totals:	130 (A)	510 (B)

Prevalence Index = B/A = 3.92

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W007

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-3	7.5YR 3/3	100					Loamy/Clayey	
3-20	7.5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W008
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.680535 Long: -87.256088 Datum: NAD83
Soil Map Unit Name: Lindside silty clay loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ____
Hydric Soil Present?	Yes X No ____		
Wetland Hydrology Present?	Yes X No ____		

Remarks:
This data point is representative of W008. Climatic/hydrologic conditions were normal as determined by the Antecedent Pricipitation Tool.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
X Water Marks (B1)	___ Presence of Reduced Iron (C4)
X Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
X Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W008

Tree Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis laevigata*	15	Yes	FACW
2. *Salix nigra*	10	Yes	OBL
3. *Acer negundo*	10	Yes	FAC
4. *Liquidambar styraciflua*	5	No	FAC
5.			
6.			
7.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Sapling/Shrub Stratum (Plot size: 15)

	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	2	No	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover:	1

Herb Stratum (Plot size: 5)

	Absolute % Cover	Dominant Species?	Indicator Status
1. *Persicaria pensylvanica*	40	Yes	FACW
2. *Boehmeria cylindrica*	30	Yes	FACW
3. *Carex lupulina*	5	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	=Total Cover	
50% of total cover: 38		20% of total cover:	15

Woody Vine Stratum (Plot size: 30)

	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	20	Yes	FAC
2. *Nekemias arborea*	10	Yes	UPL
3. *Smilax rotundifolia*	8	Yes	FAC
4.			
5.			
	38	=Total Cover	
50% of total cover: 19		20% of total cover:	8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	15	x 1 = 15
FACW species	85	x 2 = 170
FAC species	43	x 3 = 129
FACU species	2	x 4 = 8
UPL species	10	x 5 = 50
Column Totals:	155 (A)	372 (B)

Prevalence Index = B/A = 2.40

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is dominant.

SOIL

Sampling Point: W008

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	95	10YR 3/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
2-10	10YR 4/2	80	10YR 3/6	20	C	M	Loamy/Clayey	Prominent redox concentrations
10-20	10YR 4/2	60	10YR 3/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W008
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): none Slope (%): 3-5
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.680570 Long: -87.255991 Datum: NAD83
Soil Map Unit Name: Lindside silty clay loam NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
This data point is representative of uplands adjacent to W008. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W008

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	30	Yes	FAC
2. *Quercus falcata*	15	Yes	FACU
3. *Celtis laevigata*	10	No	FACW
4. *Juniperus virginiana*	10	No	FACU
5.			
6.			
7.			
	65	=Total Cover	
50% of total cover: 33		20% of total cover: 13	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	40	Yes	FACU
2. *Carya tomentosa*	8	No	UPL
3. *Ulmus alata*	5	No	FACU
4. *Juniperus virginiana*	2	No	FACU
5.			
6.			
7.			
8.			
9.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover: 11	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	50	Yes	FAC
2. *Parthenocissus quinquefolia*	20	Yes	FACU
3. *Carex sp.*	3	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	73	=Total Cover	
50% of total cover: 37		20% of total cover: 15	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	30	Yes	FAC
2. *Parthenocissus quinquefolia*	20	Yes	FACU
3.			
4.			
5.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover: 10	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	113	x 3 =	339
FACU species	112	x 4 =	448
UPL species	8	x 5 =	40
Column Totals:	243 (A)		847 (B)

Prevalence Index = B/A = 3.49

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W008

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/4	100					Loamy/Clayey	
4-12	7.5YR 3/3	100					Loamy/Clayey	
12-20	5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Courtlard/Lawrence County Sampling Date: 8/8/2023

Applicant/Owner: Urban Grid State: AL Sampling Point: W009

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.665708 Long: -87.270080 Datum: NAD83

Soil Map Unit Name: Emory-Abernathy silt loams, 0 to 6 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:
This data point is representative of W009 and is subject to flooding. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Wetland 009 is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
X Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
X Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 6
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W009

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Echinochloa crus-galli*	100	Yes	FAC
2. *Ammannia coccinea*	10	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	110	=Total Cover	
50% of total cover:	55	20% of total cover:	22

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	110 (A)		310 (B)

Prevalence Index = B/A = 2.82

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W009

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	5YR 4/4	100					Loamy/Clayey	
12-20	5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Area has accumulated soil runoff from adjacent agricultural field.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/8/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W009

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): none Slope (%): 1-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.665875 Long: -87.270159 Datum: NAD83

Soil Map Unit Name: Cumberland loam, 2 to 6 percent slopes, eroded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:
This data point is representative of uplands adjacent to W009. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W009

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Zea mays*	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W009

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-20	5YR 4/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/8/2023
Applicant/Owner: Urban Grid State: AL Sampling Point: W010
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661964 Long: -87.267974 Datum: NAD83
Soil Map Unit Name: Ooltewah silt loam NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ___
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes X No ___		

Remarks:
This data point is representative of W010 and is subject to flooding. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. Wetland 010 is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 6
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W010

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Echinochloa crus-galli*	100	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		300 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W010

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	5YR 4/4	100					Loamy/Clayey	
12-20	5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Area has accumulated soil runoff from adjacent agricultural field.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/8/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W010
Investigator(s): Paul Bright Section, Township, Range:
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): none Slope (%): 1-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661607 Long: -87.267999 Datum: NAD83
Soil Map Unit Name: Ooltewah silt loam NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X	
Wetland Hydrology Present?	Yes ___ No X	

Remarks:
This data point is representative of uplands adjacent to W010. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W010

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Zea mays*	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W010

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-20	5YR 4/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/8/2023
Applicant/Owner: Urban Grid State: AL Sampling Point: W011
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661888 Long: -87.256436 Datum: NAD83
Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation X , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W011. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. W011 was recently clear-cut and is subject to ponding. Wetland 011 is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 4
Water Table Present?	Yes X	No ___	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W011

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Fraxinus pennsylvanica*	15	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	15	=Total Cover	
50% of total cover:	8	20% of total cover:	3
Herb Stratum (Plot size: 5)			
1. *Echinochloa crus-galli*	40	Yes	FAC
2. *Persicaria pensylvanica*	30	Yes	FACW
3. *Campsis radicans*	30	Yes	FAC
4. *Cephalanthus occidentalis*	25	No	OBL
5. *Mikania scandens*	5	No	FACW
6. *Alopecurus carolinianus*	3	No	FACW
7.			
8.			
9.			
10.			
11.			
	133	=Total Cover	
50% of total cover:	67	20% of total cover:	27
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	53	x 2 =	106
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	153 (A)		356 (B)

Prevalence Index = B/A = 2.33

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W011

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-4	5YR 4/3	100					Loamy/Clayey	
4-20	5YR 4/2	50	5YR 4/6	50	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/8/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W011
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661992 Long: -87.258133 Datum: NAD83
Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation X , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:
This data point is representative of uplands adjacent to W011. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. The area was recently clear-cut and now has ruts throughout.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)
____ High Water Table (A2)
____ Saturation (A3)
____ Water Marks (B1)
____ Sediment Deposits (B2)
____ Drift Deposits (B3)
____ Algal Mat or Crust (B4)
____ Iron Deposits (B5)
____ Inundation Visible on Aerial Imagery (B7)
____ Water-Stained Leaves (B9)
____ Aquatic Fauna (B13)
____ True Aquatic Plants (B14)
____ Hydrogen Sulfide Odor (C1)
____ Oxidized Rhizospheres on Living Roots (C3)
____ Presence of Reduced Iron (C4)
____ Recent Iron Reduction in Tilled Soils (C6)
____ Thin Muck Surface (C7)
____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
____ Surface Soil Cracks (B6)
____ Sparsely Vegetated Concave Surface (B8)
____ Drainage Patterns (B10)
____ Moss Trim Lines (B16)
____ Dry-Season Water Table (C2)
____ Crayfish Burrows (C8)
____ Saturation Visible on Aerial Imagery (C9)
____ Stunted or Stressed Plants (D1)
____ Geomorphic Position (D2)
____ Shallow Aquitard (D3)
____ Microtopographic Relief (D4)
____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 2
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Water was only observed in ruts.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W011

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carya tomentosa*	8	Yes	UPL
2. *Ligustrum sinense*	8	Yes	FACU
3. *Sambucus nigra*	5	No	FAC
4. *Salix nigra*	5	No	OBL
5.			
6.			
7.			
8.			
9.			
	26	=Total Cover	
50% of total cover:	13	20% of total cover:	6

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Eupatorium serotinum*	40	Yes	FAC
2. *Rubus argutus*	20	Yes	FACU
3. *Persicaria pensylvanica*	15	No	FACW
4. *Chamaenerion angustifolium*	15	No	FAC
5. *Scirpus georgianus*	8	No	OBL
6. *Eupatorium capillifolium*	5	No	FACU
7. *Phytolacca decandra*	3	No	FACU
8. *Typha latifolia*	3	No	OBL
9.			
10.			
11.			
	109	=Total Cover	
50% of total cover:	55	20% of total cover:	22

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Parthenocissus quinquefolia*	30	Yes	FACU
2. *Toxicodendron radicans*	5	No	FAC
3.			
4.			
5.			
	35	=Total Cover	
50% of total cover:	18	20% of total cover:	7

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	16	x 1 =	16
FACW species	15	x 2 =	30
FAC species	65	x 3 =	195
FACU species	66	x 4 =	264
UPL species	8	x 5 =	40
Column Totals:	170 (A)		545 (B)

Prevalence Index = B/A = 3.21

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W011

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	5YR 3/3	100					Loamy/Clayey	
4-20	5YR 4/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/9/2023
Applicant/Owner: Urban Grid State: AL Sampling Point: W012
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): toe of slope Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.658048 Long: -87.267274 Datum: NAD83
Soil Map Unit Name: Tupelo silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are “Normal Circumstances” present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present? Yes X No ___	
Wetland Hydrology Present? Yes X No ___	

Remarks:
This data form is representative of a review of W012. Per the USACE’s antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
X Water Marks (B1)
X Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

X Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
X Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W012

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	Yes	FAC
2. *Quercus phellos*	40	Yes	FAC
3. *Ulmus americana*	10	No	FACW
4. *Acer rubrum*	5	No	FAC
5.			
6.			
7.			
	95	=Total Cover	
50% of total cover: 48		20% of total cover:	19
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ulmus americana*	15	Yes	FACW
2. *Diospyros virginiana*	10	Yes	FAC
3. *Liquidambar styraciflua*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6
Herb Stratum (Plot size: 5)			
1. *Campsis radicans*	20	Yes	FAC
2. *Penthorum sedoides*	10	Yes	OBL
3. *Heterotheca subaxillaris*	3	No	UPL
4. *Carex tribuloides*	2	No	FACW
5. *Boehmeria cylindrica*	2	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	37	=Total Cover	
50% of total cover: 19		20% of total cover:	8
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	8	Yes	FAC
2.			
3.			
4.			
5.			
	8	=Total Cover	
50% of total cover: 4		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	29	x 2 =	58
FAC species	128	x 3 =	384
FACU species	0	x 4 =	0
UPL species	3	x 5 =	15
Column Totals:	170 (A)		467 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W012

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 4/3	98	7.5YR 4/6	2	C	M	Loamy/Clayey	
4-8	10YR 4/3	80	10YR 4/6	20	C	M	Loamy/Clayey	Distinct redox concentrations
8-16	10YR 5/2	70	10YR 4/6	30	C	M	Loamy/Clayey	Prominent redox concentrations
16-20	10YR 6/2	50	10YR 4/6	50	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** X **No** ____

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/9/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W012
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 2-10
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.658217 Long: -87.267606 Datum: NAD83
Soil Map Unit Name: Cumberland loam, 2 to 6 percent slopes, eroded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of uplands adjacent to W012. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W012

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus alata*	30	Yes	FACU
2. *Celtis laevigata*	20	Yes	FACW
3. *Quercus phellos*	15	No	FAC
4. *Liquidambar styraciflua*	10	No	FAC
5. *Ligustrum sinense*	10	No	FACU
6.			
7.			
	85	=Total Cover	
50% of total cover: 43		20% of total cover:	17
Sapling/Shrub Stratum (Plot size: 15)			
1. *Ulmus alata*	30	Yes	FACU
2. *Quercus phellos*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8
Herb Stratum (Plot size: 5)			
1. *Campsis radicans*	50	Yes	FAC
2. *Persicaria virginiana*	30	Yes	FAC
3. *Rubus argutus*	8	No	FACU
4. *Boehmeria cylindrica*	3	No	FACW
5. *Polystichum acrostichoides*	2	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	93	=Total Cover	
50% of total cover: 47		20% of total cover:	19
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	23	x 2 = 46
FAC species	115	x 3 = 345
FACU species	80	x 4 = 320
UPL species	0	x 5 = 0
Column Totals:	218 (A)	711 (B)

Prevalence Index = B/A = 3.26

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was observed at this site.

SOIL

Sampling Point: W012

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-1	7.5YR 4/2	80	7.5YR 4/6	20	C	M	Loamy/Clayey	
1-20	5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W013
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.674344 Long: -87.244716 Datum: NAD83
Soil Map Unit Name: Tupelo silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W013. Climatic/hydrologic conditions were normal as determined by the Antecedent Pricipitation Tool.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes X	No ___	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W013

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	50	Yes	FAC
2. *Fraxinus pennsylvanica*	40	Yes	FACW
3. *Quercus phellos*	20	No	FAC
4. *Celtis laevigata*	10	No	FACW
5.			
6.			
7.			
	120	=Total Cover	
50% of total cover: 60		20% of total cover:	24

Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	10	Yes	FAC
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Quercus phellos*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Herb Stratum (Plot size: 5)			
1. *Ligustrum sinense*	15	Yes	FACU
2. *Campsis radicans*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25	=Total Cover	
50% of total cover: 13		20% of total cover:	5

Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	20	Yes	FAC
2. *Lonicera japonica*	10	Yes	FACU
3.			
4.			
5.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.8% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	60	x 2 =	120
FAC species	120	x 3 =	360
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	205 (A)		580 (B)

Prevalence Index = B/A = 2.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is dominant.

SOIL

Sampling Point: W013

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100						
2-20	7.5YR 5/2	60	7.5YR 4/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? Yes X **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/15/23
Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W013
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.674363 Long: -87.245306 Datum: NAD83
Soil Map Unit Name: Tupelo silt loam NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
This data point is representative of uplands adjacent to W013. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was not found at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W013

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	50	Yes	FAC
2. *Liquidambar styraciflua*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14
Sapling/Shrub Stratum (Plot size: 15)			
1. *Quercus phellos*	10	Yes	FAC
2. *Liquidambar styraciflua*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4
Herb Stratum (Plot size: 5)			
1. *Campsis radicans*	10	Yes	FAC
2. *Ulmus americana*	2	No	FACW
3. *Parthenocissus quinquefolia*	2	No	FACU
4. *Smilax rotundifolia*	2	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	16	=Total Cover	
50% of total cover: 8		20% of total cover:	4
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W013

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 3/4	100						clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Hydric soil was not present at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W014
Investigator(s): Paul Bright Section, Township, Range:
Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.679457 Long: -87.240967 Datum: NAD83
Soil Map Unit Name: Lindside silty clay loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W014. Climatic/hydrologic conditions were normal as determined by the Antecedent Pricipitation Tool.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)	___ True Aquatic Plants (B14)
X High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
X Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
X Water Marks (B1)	___ Presence of Reduced Iron (C4)
X Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
X Water-Stained Leaves (B9)	
X Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes X	No ___	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W014

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	50	Yes	FAC
2. *Fraxinus pennsylvanica*	50	Yes	FACW
3. *Quercus phellos*	20	No	FAC
4. *Celtis laevigata*	10	No	FACW
5.			
6.			
7.			
	130	=Total Cover	
50% of total cover: 65		20% of total cover:	26

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	10	Yes	FAC
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Quercus phellos*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	20	Yes	FACU
2. *Campsis radicans*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	20	Yes	FAC
2. *Lonicera japonica*	10	Yes	FACU
3.			
4.			
5.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.8% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	120	x 3 =	360
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	220 (A)		620 (B)

Prevalence Index = B/A = 2.82

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is dominant.

SOIL

Sampling Point: W014

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100						
2-20	7.5YR 5/2	60	7.5YR 4/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/15/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W014

Investigator(s): Paul Bright Section, Township, Range: ____

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.679442 Long: -87.241300 Datum: NAD83

Soil Map Unit Name: Monongahela and Holston fine sandy loams, undulating phase NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ___ No X
Hydric Soil Present? Yes ___ No X
Wetland Hydrology Present? Yes ___ No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
This data point is representative of uplands adjacent to W014. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was not found at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W014

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	25	Yes	FAC
2. *Liquidambar styraciflua*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	10	Yes	FAC
2. *Liquidambar styraciflua*	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	10	Yes	FAC
2. *Ulmus americana*	2	No	FACW
3. *Parthenocissus quinquefolia*	2	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	14	=Total Cover	
50% of total cover: 7		20% of total cover:	3

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	8	Yes	FAC
2.			
3.			
4.			
5.			
	8	=Total Cover	
50% of total cover: 4		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W014

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Hydric soil was not present at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W015
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.680418 Long: -87.239447 Datum: NAD83
Soil Map Unit Name: Melvin silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
This data point is representative of W015. Climatic/hydrologic conditions were normal as determined by the Antecedent Pricipitation Tool.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 1
Water Table Present?	Yes X	No ____	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W015

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	50	Yes	FAC
2. *Fraxinus pennsylvanica*	50	Yes	FACW
3. *Quercus phellos*	20	No	FAC
4. *Celtis laevigata*	10	No	FACW
5.			
6.			
7.			
	130	=Total Cover	
50% of total cover:	65	20% of total cover:	26
Sapling/Shrub Stratum (Plot size: 15)			
1. *Liquidambar styraciflua*	10	Yes	FAC
2. *Fraxinus pennsylvanica*	10	Yes	FACW
3. *Quercus phellos*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover:	15	20% of total cover:	6
Herb Stratum (Plot size: 5)			
1. *Ligustrum sinense*	20	Yes	FACU
2. *Campsis radicans*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40	=Total Cover	
50% of total cover:	20	20% of total cover:	8
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	20	Yes	FAC
2. *Lonicera japonica*	10	Yes	FACU
3.			
4.			
5.			
	30	=Total Cover	
50% of total cover:	15	20% of total cover:	6

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 77.8% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	130	x 3 =	390
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	230 (A)		650 (B)

Prevalence Index = B/A = 2.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is dominant.

SOIL

Sampling Point: W015

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100						
2-20	7.5YR 5/2	60	7.5YR 4/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/11/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W016

Investigator(s): Michael Inman Section, Township, Range: ______

Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.672230 Long: -87.241467 Datum: NAD83

Soil Map Unit Name: Lindside silty clay loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?**	**Yes** X **No** ___
Hydric Soil Present?	Yes X No ___		
Wetland Hydrology Present?	Yes X No ___		

Remarks:
This data point is representative of W016. Climatic/hydrologic conditions were normal as determined by the Antecedent Pricipitation Tool.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)	
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)	
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)	
X Water Marks (B1)	___ Presence of Reduced Iron (C4)	
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)	
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)	
___ Iron Deposits (B5)		
___ Inundation Visible on Aerial Imagery (B7)		
X Water-Stained Leaves (B9)		
___ Aquatic Fauna (B13)		

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W016

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	25	Yes	OBL
2. *Platanus occidentalis*	10	Yes	FACW
3. *Sambucus nigra*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover:	23	20% of total cover:	9

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juncus effusus*	40	Yes	FACW
2. *Scirpus georgianus*	30	Yes	OBL
3. *Campsis radicans*	30	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	50	x 2 =	100
FAC species	40	x 3 =	120
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	145 (A)		275 (B)

Prevalence Index = B/A = 1.90

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** __

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is dominant.

SOIL

Sampling Point: W016

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100						
2-20	7.5YR 5/2	70	7.5YR 4/6	30	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:
Hydric soils are present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/11/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W016
Investigator(s): Michael Inman Section, Township, Range: ____
Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.672048 Long: -87.241335 Datum: NAD83
Soil Map Unit Name: Decatur silty clay loam, 2 to 6 percent slopes, eroded NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
This data point is representative of uplands adjacent to W016. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)
- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W016

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	=Total Cover		
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Chamaenerion angustifolium*	20	Yes	FAC
2. *Alopecurus sp.*	15	Yes	FAC
3. *Rubus argutus*	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40 =Total Cover		
50% of total cover: 20		20% of total cover: 8	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	35	x 3 =	105
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	40 (A)		125 (B)

Prevalence Index = B/A = 3.13

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was observed at this site.

SOIL

Sampling Point: W016

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 3/3	100					Loamy/Clayey	
3-20	7.5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro (W1-22-BES) City/County: Lawrence Sampling Date: 8/10/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W017

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2-10

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.666891 Long: -87.239349 Datum: WGS84

Soil Map Unit Name: Ra- Robertsville silt loam, Mc- Tyler and Monongahela fine sandy loams NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W017. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
X Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
X Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrologic indicators were present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W017

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	=Total Cover	
50% of total cover:	10	20% of total cover:	4
Sapling/Shrub Stratum (Plot size: 30)			
1. *Ilex decidua*	20	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover:	10	20% of total cover:	4
Herb Stratum (Plot size: 5)			
1. *Juncus effusus*	50	Yes	FACW
2. *Dichanthelium clandestinum*	40	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover:	45	20% of total cover:	18
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	130 (A)		320 (B)

Prevalence Index = B/A = 2.46

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
The vegetation passed the dominance tes and prevalence index.

SOIL

Sampling Point: W017

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/3	80	10YR 4/6	20	D	M		silty clay
8-18	10YR 7/2	80	10YR 4/6	20	D	M		silty clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:
Hydric soil was present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro (W1-22-BES_Upland) City/County: Lawrence Sampling Date: 8/10/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W017

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 2-10

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.6667 Long: 84.239158 Datum: WGS84

Soil Map Unit Name: Ac- Abernathy-Emoory silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:
This data point is representative of uplands adjacent to W017. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W017

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Sorgum halepense*	50	Yes	FACU
2. *Solidago altissima*	40	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover:	45	20% of total cover:	18
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	90 (A)		360 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W017

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	5YR 6/3	100						silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/9/23
Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W018
Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661737 Long: 87.231837 Datum: WGS84
Soil Map Unit Name: Ra- Robertsville silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W018. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was observed in the sample area.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W018

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus lyrata*	35	Yes	OBL
2. *Quercus nigra*	20	Yes	FAC
3. *Liquidambar styraciflua*	15	Yes	FAC
4.			
5.			
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	10	Yes	FAC
2. *Ligustrum sinense*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus nigra*	3	No	FAC
2. *Quercus lyrata*	3	No	OBL
3. *Campsis radicans*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	16	=Total Cover	
50% of total cover: 8		20% of total cover:	4

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
The vegetation in this sample site passed the dominance test.

SOIL

Sampling Point: W018

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100						
2-18	10YR 5/3	50	5YR 4/6	50	C	M		redox present
18-20	10YR 6/1	95	5YR 4/6	5				redox present; clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
X Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soil was present at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/9/23
Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W018
Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ___
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.662180 Long: 87.231514 Datum: WGS84
Soil Map Unit Name: Ra- Robertsville silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
This data point is representative of uplands adjacent to W018. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was not found at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W018

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Ambrosia artemisiifolia*	10	No	FACU
2. *Sambucus canadensis*	10	No	FAC
3. *Setaria pumila*	30	Yes	FAC
4. *Zea mays*	30	Yes	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80	=Total Cover	
50% of total cover:	40	20% of total cover:	16

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
The upland point was taken in a corn crop field.

SOIL

Sampling Point: W018

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 3/4	100						clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Hydric soil was not present at the sample site.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/9/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W019

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ______

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.659567 Long: 87.231770 Datum: WGS84

Soil Map Unit Name: Ob- Ooltewah silt loam; De- Decatur silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W019. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. This wetland is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W019

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis laevigata*	10	No	FACW
2. *Liquidambar styraciflua*	70	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	20	Yes	FAC
2. *Campsis radicans*	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	20	Yes	FAC
2. *Smilax rotundifolia*	20	Yes	FAC
3. *Vitis rotundifolia*	20	Yes	FAC
4.			
5.			
	60	=Total Cover	
50% of total cover: 30		20% of total cover:	12

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was present.

SOIL

Sampling Point: W019

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-20	5YR 3/4	80	10YR 5/2	20	D	M		clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soil was found at the site.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/9/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W019

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ___

Landform (hillside, terrace, etc.): ___ Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.659597 Long: 87.232097 Datum: WGS84

Soil Map Unit Name: Ob- Ooltewah silt loam NWI classification: ___

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W019. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W019

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Zea mays*	100	Yes	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
The upland point was taken in a corn crop field.

SOIL

Sampling Point: W019

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 3/4	100						clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Hydric soil was not found at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W020

Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.667487 Long: -87.229065 Datum: NAD 83

Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasioanlly ponded NWI classification: PFO6F

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?**	**Yes** x **No** ___
Hydric Soil Present?	Yes x No ___		
Wetland Hydrology Present?	Yes x No ___		

Remarks:
This data point is representative of W020. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
x Water Marks (B1)
___ Sediment Deposits (B2)
x Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
x Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
x Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
x Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W020

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	45	Yes	FAC
2. *Liquidambar styraciflua*	25	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14
Sapling/Shrub Stratum (Plot size: 30)			
1. *Quercus phellos*	15	Yes	FAC
2. *Ligustrum sinense*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4
Herb Stratum (Plot size: 30)			
1. *Quercus phellos*	2	No	FAC
2. *Smilax rotundifolia*	2	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	4	=Total Cover	
50% of total cover: 2		20% of total cover:	1
Woody Vine Stratum (Plot size: 30)			
1. *Vitis rotundifolia*	2	No	FAC
2.			
3.			
4.			
5.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover:	1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	91	x 3 =	273
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	96 (A)		293 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W020

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					Loamy/Clayey	fine silty loam
6-20	10YR 6/1	80	7.5YR 4/6	20	C	PL/M	Loamy/Clayey	fine silty loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? Yes x **No** ___

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W020

Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.667438 Long: -87.229090 Datum: NAD 83

Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: PFO1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____ , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No X

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No ____
Hydric Soil Present?	Yes ____	No x
Wetland Hydrology Present?	Yes x	No ____

Is the Sampled Area within a Wetland? **Yes** ____ **No** x

Remarks:
This data point is representative of uplands adjacent to W020. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W020

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	10	No	FACU
2. *Quercus bicolor*	10	No	FACW
3. *Qircus nigra*	25	Yes	FAC
4. *Quercus pellos*	15	Yes	FAC
5. *Aver rubrum*	10	No	FAC
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover:	14

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	10	Yes	FAC
2. *Ulmus americana*	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	15	Yes	FAC
2. *Quercus phellos*	5	Yes	FAC
3. *Nyssa sylvatica*	2	No	FAC
4. *Toxicodendron radicans*	2	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	24	=Total Cover	
50% of total cover: 12		20% of total cover:	5

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	84	x 3 =	252
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	114 (A)		332 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W020

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-3	7.5YR 4/4	100					Loamy/Clayey	silty loam
3-20	10YR 6/4	90	7.5YR 5/8	10	C	M	Loamy/Clayey	silty loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ____ **No** x

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W020
Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.670351 Long: -87.223929 Datum: NAD 83
Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: PFO6F
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?**	**Yes** x **No** ___
Hydric Soil Present?	Yes x No ___		
Wetland Hydrology Present?	Yes x No ___		

Remarks:
This data point is representative of W020. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes x	No ___	Depth (inches): 1
Water Table Present?	Yes x	No ___	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes x	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W020

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 30)			
1. *Cephalanthus occidentalis*	10	Yes	OBL
2. *Salix nigra*	10	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover:	10	20% of total cover:	4
Herb Stratum (Plot size: 30)			
1. *Cyperus rotundus*	95	Yes	FAC
2. *Xanthium strumarium*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		320 (B)

Prevalence Index = B/A = 2.67

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W020

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 4/2	95	10YR 4/6	5	C	PL/M	Loamy/Clayey	clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** _x_ **No** ___

Remarks:
Saturation at the surface

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W021
Investigator(s): L. Hues & J. Irvin Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.662692 Long: -87.224521 Datum: NAD 83
Soil Map Unit Name: Abernathy-Emory silt loams, 0 to 2 percent slopes NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes ___ No x	
Wetland Hydrology Present?	Yes x No ___	

Remarks:
This data point is representative of W021. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. This wetland is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
x Water Marks (B1)
___ Sediment Deposits (B2)
x Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
x Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
x Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): ___
Water Table Present? Yes ___ No x Depth (inches): ___
Saturation Present? Yes ___ No x Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? Yes X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W021

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	70	Yes	FAC
2. *Liquidambar styraciflua*	10	No	FAC
3. *Celtis occidentalis*	5	No	FACU
4. *Ulmus americana*	5	No	FACW
5.			
6.			
7.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover: 18	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	25	Yes	FAC
2. *Celtis occidentalis*	15	Yes	FACU
3. *Ulmus americana*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover: 9	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	1	No	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	1	=Total Cover	
50% of total cover: 1		20% of total cover: 1	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	2	No	FAC
2.			
3.			
4.			
5.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover: 1	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	108	x 3 =	324
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	138 (A)		424 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W021

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/4	100					Loamy/Clayey	silt loam
1-5	10YR 3/3	98	7.5YR 4/6	2	C	PL	Loamy/Clayey	silty clay loam
5-20	7.5YR 4/4	95	5YR 5/8	5	C	PL/M	Loamy/Clayey	silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/3

Applicant/Owner: Urban Grid State: AL Sampling Point: W021

Investigator(s): L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 2-4

Subregion (LRR or MLRA): LRR N Lat: 34.662638 Long: -87.224317 Datum: NAD 83

Soil Map Unit Name: Decatur silty clay loam, 2 to 6 percent slopes, eroded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** x
Hydric Soil Present?	Yes ____	No x	
Wetland Hydrology Present?	Yes ____	No x	

Remarks:
This data point is representative of uplands adjacent to W021. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)	
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)	
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)	
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)	
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)	
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)	
___ Iron Deposits (B5)		
___ Inundation Visible on Aerial Imagery (B7)		
___ Water-Stained Leaves (B9)		
___ Aquatic Fauna (B13)		

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W021

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraiciflua*	50	Yes	FAC
2. *Quercus falcata*	15	No	FACU
3. *Celtis occidentalis*	15	No	FACU
4. *Quercus nigra*	5	No	FAC
5.			
6.			
7.			
	85	=Total Cover	
50% of total cover:	43	20% of total cover:	17
Sapling/Shrub Stratum (Plot size: 30)			
1. *Morus rubra*	10	Yes	FACU
2. *Ulmus americana*	5	Yes	FACW
3. *Celtis occidentalis*	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover:	10	20% of total cover:	4
Herb Stratum (Plot size: 30)			
1. *Toxicodendron radicans*	10	Yes	FAC
2. *Morus rubra*	2	No	FACU
3. *Smilax rodundifolia*	2	No	FAC
4. *Celtis occidentalis*	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	16	=Total Cover	
50% of total cover:	8	20% of total cover:	4
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	12	Yes	FAC
2.			
3.			
4.			
5.			
	12	=Total Cover	
50% of total cover:	6	20% of total cover:	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	79	x 3 =	237
FACU species	49	x 4 =	196
UPL species	0	x 5 =	0
Column Totals:	133 (A)		443 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W021

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/4	100					Loamy/Clayey	silt loam
4-16	7.5YR 4/6	50	10YR 4/3	50	C	M	Loamy/Clayey	silty clay loam
16-20	7.5YR 4/6	98	5YR 4/6	2	C	PL	Loamy/Clayey	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present? **Yes** ____ **No** x

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W022

Investigator(s): L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.660902 Long: -87.224424 Datum: NAD 83

Soil Map Unit Name: Abernathy-Emory silt loams, 0 to 2 percent slopes NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes ___	No x	
Wetland Hydrology Present?	Yes x	No ___	

Remarks:
This data point is representative of W022. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. This wetland is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- x Water Marks (B1)
- ___ Sediment Deposits (B2)
- x Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- x Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W022

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	70	Yes	FAC
2. *Liquidambar styraciflua*	10	No	FAC
3. *Celtis occidentalis*	5	No	FACU
4. *Ulmus americana*	5	No	FACW
5.			
6.			
7.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover: 18	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	25	Yes	FAC
2. *Celtis occidentalis*	15	Yes	FACU
3. *Ulmus americana*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover: 9	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	1	No	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	1	=Total Cover	
50% of total cover: 1		20% of total cover: 1	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	2	No	FAC
2.			
3.			
4.			
5.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover: 1	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	10	x 2 = 20
FAC species	108	x 3 = 324
FACU species	20	x 4 = 80
UPL species	0	x 5 = 0
Column Totals:	138 (A)	424 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W022

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/4	100					Loamy/Clayey	silt loam
1-5	10YR 3/3	98	7.5YR 4/6	2	C	PL	Loamy/Clayey	silty clay loam
5-20	7.5YR 4/4	95	5YR 5/8	5	C	PL/M	Loamy/Clayey	silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/3

Applicant/Owner: Urban Grid State: AL Sampling Point: W022

Investigator(s): L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 2-4

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.660660 Long: -87.224362 Datum: NAD 83

Soil Map Unit Name: Dewey cherty silty clay loam, eroded, rolling phase NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	x	
Hydric Soil Present?		x
Wetland Hydrology Present?		x

Is the Sampled Area within a Wetland? **Yes** ___ **No** x

Remarks:
This data point is representative of uplands adjacent to W022. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		x	
Water Table Present?		x	
Saturation Present? (includes capillary fringe)		x	

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W022

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraiciflua*	50	Yes	FAC
2. *Quercus falcata*	15	No	FACU
3. *Celtis occidentalis*	15	No	FACU
4. *Quercus nigra*	5	No	FAC
5.			
6.			
7.			
	85	=Total Cover	
50% of total cover: 43		20% of total cover:	17

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus rubra*	10	Yes	FACU
2. *Ulmus americana*	5	Yes	FACW
3. *Celtis occidentalis*	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	10	Yes	FAC
2. *Morus rubra*	2	No	FACU
3. *Smilax rodundifolia*	2	No	FAC
4. *Celtis occidentalis*	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	16	=Total Cover	
50% of total cover: 8		20% of total cover:	4

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	12	Yes	FAC
2.			
3.			
4.			
5.			
	12	=Total Cover	
50% of total cover: 6		20% of total cover:	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	79	x 3 =	237
FACU species	49	x 4 =	196
UPL species	0	x 5 =	0
Column Totals:	133 (A)		443 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W022

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/4	100					Loamy/Clayey	silt loam
4-16	7.5YR 4/6	50	10YR 4/3	50	C	M	Loamy/Clayey	silty clay loam
16-20	7.5YR 4/6	98	5YR 4/6	2	C	PL	Loamy/Clayey	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W023
Investigator(s): L. Hues & J. Irvin Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.663434 Long: -87.222611 Datum: NAD 83
Soil Map Unit Name: Abernathy-Emory silt loams, 0 to 2 percent slopes NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation X, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?**	**Yes** x **No** ___
Hydric Soil Present?	Yes ___ No x		
Wetland Hydrology Present?	Yes x No ___		

Remarks:
This data point is representative of uplands adjacent to W23. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. This wetland is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
x Water Marks (B1)
___ Sediment Deposits (B2)
x Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
x Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
x Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W023

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	70	Yes	FAC
2. *Liquidambar styraciflua*	10	No	FAC
3. *Celtis occidentalis*	5	No	FACU
4. *Ulmus americana*	5	No	FACW
5.			
6.			
7.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover: 18	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	25	Yes	FAC
2. *Celtis occidentalis*	15	Yes	FACU
3. *Ulmus americana*	5	No	FACW
4.			
5.			
6.			
7.			
8.			
9.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover: 9	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	1	No	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	1	=Total Cover	
50% of total cover: 1		20% of total cover: 1	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	2	No	FAC
2.			
3.			
4.			
5.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover: 1	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	108	x 3 =	324
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	138 (A)		424 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W023

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/4	100					Loamy/Clayey	silt loam
1-5	10YR 3/3	98	7.5YR 4/6	2	C	PL	Loamy/Clayey	silty clay loam
5-20	7.5YR 4/4	95	5YR 5/8	5	C	PL/M	Loamy/Clayey	silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/3

Applicant/Owner: Urban Grid State: AL Sampling Point: W023

Investigator(s): L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 2-4

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.663383 Long: -87.222382 Datum: NAD 83

Soil Map Unit Name: Abernathy-Emory silt loams, 0 to 2 percent NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** x
Hydric Soil Present?	Yes ____	No x	
Wetland Hydrology Present?	Yes ____	No x	

Remarks:
This data point is representative of uplands adjacent to W023. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W023

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraiciflua*	50	Yes	FAC
2. *Quercus falcata*	15	No	FACU
3. *Celtis occidentalis*	15	No	FACU
4. *Quercus nigra*	5	No	FAC
5.			
6.			
7.			
	85	=Total Cover	
50% of total cover: 43		20% of total cover:	17

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Morus rubra*	10	Yes	FACU
2. *Ulmus americana*	5	Yes	FACW
3. *Celtis occidentalis*	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	10	Yes	FAC
2. *Morus rubra*	2	No	FACU
3. *Smilax rodundifolia*	2	No	FAC
4. *Celtis occidentalis*	2	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	16	=Total Cover	
50% of total cover: 8		20% of total cover:	4

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Smilax rotundifolia*	12	Yes	FAC
2.			
3.			
4.			
5.			
	12	=Total Cover	
50% of total cover: 6		20% of total cover:	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	79	x 3 =	237
FACU species	49	x 4 =	196
UPL species	0	x 5 =	0
Column Totals:	133 (A)		443 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W023

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/4	100					Loamy/Clayey	silt loam
4-14	7.5YR 4/6	50	10YR 4/3	50	C	M	Loamy/Clayey	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: bedrock

Depth (inches): 14

Hydric Soil Present? **Yes** ___ **No** x

Remarks:
Bedrock at 14"

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W024
Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.663340 Long: -87.214387 Datum: NAD 83
Soil Map Unit Name: Roberstville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: PFO1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ____	**Is the Sampled Area within a Wetland?**	**Yes** x **No** ____
Hydric Soil Present?	Yes x No ____		
Wetland Hydrology Present?	Yes x No ____		

Remarks:
This data point is representative of W024. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
x Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
x Saturation Visible on Aerial Imagery (C9)
x Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? Yes X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W024

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	30	Yes	OBL
2. *Pinus taeda*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7
Sapling/Shrub Stratum (Plot size: 30)			
1. *Cephalanthus occidentalis*	85	Yes	OBL
2. *Campsis radicans*	15	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	100	=Total Cover	
50% of total cover: 50		20% of total cover:	20
Herb Stratum (Plot size: 30)			
1. *Carex crinita*	5	Yes	OBL
2. *Bohemeria cylindrica*	5	Yes	FACW
3. *Diodia virginiana*	3	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	13	=Total Cover	
50% of total cover: 7		20% of total cover:	3
Woody Vine Stratum (Plot size: 30)			
1. *Campsis radicans*	2	No	FAC
2.			
3.			
4.			
5.			
	2	=Total Cover	
50% of total cover: 1		20% of total cover:	1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	120	x 1 =	120
FACW species	8	x 2 =	16
FAC species	22	x 3 =	66
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	150 (A)		202 (B)

Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W024

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	90	5YR 4/6	10	C	PL/M	Loamy/Clayey	silty loam
4-20	10YR 6/1	90	5Yr 4/6	10	C	PL	Loamy/Clayey	fine silty loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
X Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** x **No** ___

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	***OMB Control #: 0710-0024, Exp:11/30/2024*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 1014/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W024 - Up

Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 1-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.663252 Long: -87.214122 Datum: NAD 83

Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No x	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** x
Hydric Soil Present?	Yes ____	No x	
Wetland Hydrology Present?	Yes ____	No x	

Remarks:
This data point is representative of uplands adjacent to W024. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W024 - Up

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus laevis*	40	Yes	UPL
2. *Quercus phellos*	15	Yes	FAC
3. *Pinus taeda*	15	Yes	FAC
4. *Celtis occidentalis*	10	No	FACU
5.			
6.			
7.			
	80	=Total Cover	
50% of total cover: 40		20% of total cover:	16

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus laevis*	8	Yes	UPL
2. *Quercus nigra*	2	No	FAC
3. *Ailanthus altissima*	10	Yes	FACU
4. *Callicarpa americana*	10	Yes	FACU
5. *Pinus taeda*	5	No	FAC
6. *Prunus serotina*	5	No	FACU
7.			
8.			
9.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover:	1

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis rotundifolia*	40	Yes	FAC
2.			
3.			
4.			
5.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	82	x 3 =	246
FACU species	35	x 4 =	140
UPL species	48	x 5 =	240
Column Totals:	165 (A)		626 (B)

Prevalence Index = B/A = 3.79

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W024 - Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 5/4	100					Loamy/Clayey	silty loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W025

Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661738 Long: -87.215706 Datum: NAD 83

Soil Map Unit Name: Tyler and Monongahela fine sandy loams, level phases NWI classification: PFO1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?**	**Yes** x **No** ___
Hydric Soil Present?	Yes x No ___		
Wetland Hydrology Present?	Yes x No ___		

Remarks:
This data point is representative of W025. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
x Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- x Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W025

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus taeda*	5	Yes	FAC
2. *Diospyros virginiana*	5	Yes	FAC
3. *Liquidambar styraciflua*	5	Yes	FAC
4.			
5.			
6.			
7.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover: 3	

Sapling/Shrub Stratum (Plot size: 30)			
1. *Liquidambar styraciflua*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover: 1	

Herb Stratum (Plot size: 30)			
1. *Boehmeria cylindrica*	80	Yes	FACW
2. *Carex crinita*	5	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	85	=Total Cover	
50% of total cover: 43		20% of total cover: 17	

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	80	x 2 =	160
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		225 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W025

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 5/1	90	10YR 4/6	10	C	PL/M	Loamy/Clayey	silty loam
4-9	10YR 4/2	50	10YR 6/1	45	D	M	Loamy/Clayey	silty loam
			10YR 6/8	5	C	PL		
9-20	10YR 6/1	90	10YR 6/8	10	C	M	Loamy/Clayey	silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** _x_ **No** ___

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W025

Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661660 Long: -87.215443 Datum: NAD 83

Soil Map Unit Name: Tyler and Monongahela fine sandy loams, level phases NWI classification: PFO1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ____	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** x
Hydric Soil Present?	Yes ____ No x		
Wetland Hydrology Present?	Yes ____ No x		

Remarks:
This data point is representative of uplands adjacent to W025. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W025

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus taeda*	60	Yes	FAC
2. *Quercus nigra*	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	75	=Total Cover	
50% of total cover:	38	20% of total cover:	15

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus nigra*	15	Yes	FAC
2. *Liquidambar styraciflua*	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover:	10	20% of total cover:	4

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	10	Yes	FAC
2. *Ulmus americana*	2	No	FACW
3. *Parthenocissus quinquefolia*	2	No	FACU
4. *Smilax rotundifolia*	2	No	FAC
5. *Quercsu phellos*	1	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	17	=Total Cover	
50% of total cover:	9	20% of total cover:	4

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	108	x 3 =	324
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	112 (A)		336 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W025

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					Loamy/Clayey	loam
5-20	10YR 6/3	98	10YR 6/6	2	C	PL	Loamy/Clayey	silty loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? Yes ____ No ____

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W026

Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): convex Slope (%): 0-3

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661962 Long: -87.211583 Datum: NAD83

Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ____	**Is the Sampled Area within a Wetland?** **Yes** x **No** ____
Hydric Soil Present?	Yes x No ____	
Wetland Hydrology Present?	Yes x No ____	

Remarks:
This data point is representative of W026. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

____ Surface Water (A1)	____ True Aquatic Plants (B14)
____ High Water Table (A2)	____ Hydrogen Sulfide Odor (C1)
____ Saturation (A3)	____ Oxidized Rhizospheres on Living Roots (C3)
____ Water Marks (B1)	____ Presence of Reduced Iron (C4)
____ Sediment Deposits (B2)	____ Recent Iron Reduction in Tilled Soils (C6)
x Drift Deposits (B3)	____ Thin Muck Surface (C7)
____ Algal Mat or Crust (B4)	____ Other (Explain in Remarks)
____ Iron Deposits (B5)	
____ Inundation Visible on Aerial Imagery (B7)	
____ Water-Stained Leaves (B9)	
____ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

____ Surface Soil Cracks (B6)
____ Sparsely Vegetated Concave Surface (B8)
x Drainage Patterns (B10)
____ Moss Trim Lines (B16)
____ Dry-Season Water Table (C2)
____ Crayfish Burrows (C8)
____ Saturation Visible on Aerial Imagery (C9)
____ Stunted or Stressed Plants (D1)
____ Geomorphic Position (D2)
____ Shallow Aquitard (D3)
____ Microtopographic Relief (D4)
____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W026

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus taeda*	10	No	FAC
2. *Celtis occidentalis*	50	Yes	FACU
3. *Nyssa sylvatica*	5	No	FAC
4.			
5.			
6.			
7.			
	65	=Total Cover	
50% of total cover: 33		20% of total cover: 13	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis occidentalis*	40	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover: 8	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	20	Yes	FAC
2. *Solidago gigantea*	15	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover: 7	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	35	x 3 =	105
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	140 (A)		495 (B)

Prevalence Index = B/A = 3.54

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W026

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/3	100					Loamy/Clayey	loam
5-9	10YR 3/2	70	10YR 4/1	30	D	M	Loamy/Clayey	silty loam
9-20	10YR 5/2	80	10YR 4/4	20	C	M	Loamy/Clayey	silty loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X **No** ___

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/14/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W026

Investigator(s): B. Burdette, L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 1-3

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.661792 Long: -87.212063 Datum: NAD 83

Soil Map Unit Name: Robertsville silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No x	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** x
Hydric Soil Present?	Yes ____ No x	
Wetland Hydrology Present?	Yes ____ No x	

Remarks:
This data point is representative of uplands adjacent to W026. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W026

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus laevis*	35	Yes	UPL
2. *Quercus phellos*	10	No	FAC
3. *Pinus taeda*	15	Yes	FAC
4. *Celtis occidentalis*	15	Yes	FACU
5.			
6.			
7.			
	75	=Total Cover	
50% of total cover: 38		20% of total cover:	15

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus laevis*	5	No	UPL
2. *Quercus nigra*	2	No	FAC
3. *Ailanthus altissima*	10	Yes	FACU
4. *Callicarpa americana*	10	Yes	FACU
5. *Pinus taeda*	5	No	FAC
6. *Prunus serotina*	5	No	FACU
7.			
8.			
9.			
	37	=Total Cover	
50% of total cover: 19		20% of total cover:	8

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis rotundifolia*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	=Total Cover	
50% of total cover: 3		20% of total cover:	1

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis rotundifolia*	40	Yes	FAC
2.			
3.			
4.			
5.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	77	x 3 =	231
FACU species	40	x 4 =	160
UPL species	40	x 5 =	200
Column Totals:	157 (A)		591 (B)

Prevalence Index = B/A = 3.76

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W026

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-20	10YR 5/4	100					Loamy/Clayey	silty loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ No ___

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W027

Investigator(s): L. Hues & J. Irvin Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N Lat: 34.659093 Long: -87.228606 Datum: NAD 83

Soil Map Unit Name: Decatur silty caly loam, 2 to 6 percent slopes, eroded NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes ___ No x	
Wetland Hydrology Present?	Yes x No ___	

Remarks:
This data point is representative of W027. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. Agricultural practices have resulted from excessive erosional runoff; and thus, soils within this wetland exhibit matrix colors with a chroma equal to or greater than 3. This wetland is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- x Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- x Drift Deposits (B3)
- x Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes x	No ___	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W027

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus taeda*	15	Yes	FAC
2. *Liqiudambar styraciflua*	15	Yes	FAC
3. *Quercus phellos*	15	Yes	FAC
4.			
5.			
6.			
7.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover: 9	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	30	Yes	FACW
2. *Celtis occidentalis*	5	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover: 7	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rubus sp.*	2	No	FAC
2. *Ulmus americana*	1	No	FACW
3. *Celtis occidentalis*	1	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	4	=Total Cover	
50% of total cover: 2		20% of total cover: 1	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	31	x 2 = 62
FAC species	47	x 3 = 141
FACU species	6	x 4 = 24
UPL species	0	x 5 = 0
Column Totals:	84 (A)	227 (B)

Prevalence Index = B/A = 2.70

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W027

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR 3/4	95	2.5YR 4/8	5	C	PL	Loamy/Clayey	clay
4-20	2.5YR 3/4	80	2.5YR 4/8	20	C	PL/M	Loamy/Clayey	clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 8/15/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W027

Investigator(s): L. Hues & J. Irvin Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.659213 Long: -87.228551 Datum: NAD 83

Soil Map Unit Name: Decatur silty clay loam, 2 to 6 percent slopes, eroded NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No x	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** x
Hydric Soil Present?	Yes ___ No x		
Wetland Hydrology Present?	Yes ___ No x		

Remarks:
This data point is representative of uplands adjacent to W027. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): ___
Water Table Present? Yes ___ No x Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W027

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	30	Yes	FAC
2. *Ulmus americana*	15	Yes	FACW
3. *Quercus laevis*	5	No	UPL
4.			
5.			
6.			
7.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover: 10	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus laevis*	5	Yes	UPL
2. *Celtis occidentalis*	5	Yes	FACU
3. *Liquidambar styraciflua*	5	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover: 3	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Gossypium hirsutum*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15	=Total Cover	
50% of total cover: 8		20% of total cover: 3	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	35	x 3 =	105
FACU species	20	x 4 =	80
UPL species	10	x 5 =	50
Column Totals:	80 (A)		265 (B)

Prevalence Index = B/A = 3.31

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W027

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5YR 3/4	95	2.5YR 4/8	5	C	PL	Loamy/Clayey	clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______________

Depth (inches): ______________

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/9/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W028

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): ____ Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.654738 Long: 87.228517 Datum: WGS84

Soil Map Unit Name: Ob- Ooltewah silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W028. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. This wetland is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
X Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
X Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: W028

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus lyrata*	90	Yes	OBL
2. *Salix caroliniana*	10	No	OBL
3.			
4.			
5.			
6.			
7.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)			
1. *Campsis radicans*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was found at the sample site.

SOIL

Sampling Point: W028

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	5YR 3/4	80	10YR 5/2	20	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:
Hydric soil was found at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/9/23
Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W028
Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.654104 Long: 87.229569 Datum: WGS84
Soil Map Unit Name: Ac- Abernathy-Emory silt loam NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W028. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found in this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W028

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Zea mays*	100	Yes	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
The upland point was found in a corn crop field.

SOIL

Sampling Point: W028

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 3/4	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Hydric soil was not found at this sample site.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/8/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W029

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.652653 Long: 87.225106 Datum: WGS84

Soil Map Unit Name: Ob- Ooltewah silt loam; De- Decatur silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
This data point is representative of W029. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year. This wetland is not adjacent to or have a continuous surface connection to a relatively permanent, standing or continuously flowing body of water, and thus, classified as isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was found at the sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W029

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis laevigata*	20	Yes	FACW
2. *Quercus nigra*	10	Yes	FAC
3. *Acer rubrum*	10	Yes	FAC
4. *Morus rubra*	5	No	FACU
5.			
6.			
7.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover:	9

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ligustrum sinense*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	10	Yes	FAC
2. *Ampelopsis arborea*	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vitis rotundifolia*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
The vegetation at the sample site passed the dominance test.

SOIL

Sampling Point: W029

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	90	5YR 4/6	10	C	M		clay loam
6-20	10YR 7/1	85	5YR 4/6	15	C	PL		clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
X Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X **No** ___

Remarks:
Soil contained redox in the pore linings, indicating hydric soil.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/7/23
Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W029
Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____
Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.652665 Long: 87.225840 Datum: WGS84
Soil Map Unit Name: Dc- Decatur silty clay loam NWI classification: ____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W029. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was not found at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W029

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	=Total Cover		
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Gossypium hirsutum*	75	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75 =Total Cover		
50% of total cover: 38		20% of total cover: 15	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
The surrounding area of the wetland was an upalnd cotton field.

SOIL

Sampling Point: W029

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	5YR 4/6	100						clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________

Depth (inches): ________

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
No hydric soil was found at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-xxxx, Exp: Pending
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Courtland/Lawrence County Sampling Date: 8/8/2023
Applicant/Owner: Urban Grid State: AL Sampling Point: W030a - Wet
Investigator(s): Paul Bright Section, Township, Range: ____
Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.651462 Long: -87.222140 Datum: NAD83
Soil Map Unit Name: Ooltewah silt loam NWI classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data form is representative of W030a. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators are present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W030a - Wet

Tree Stratum (Plot size: 30)

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	

50% of total cover: ______ 20% of total cover: ______

Sapling/Shrub Stratum (Plot size: 30)

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	

50% of total cover: ______ 20% of total cover: ______

Herb Stratum (Plot size: 30)

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ludwigia palustris*	20	Yes	OBL
2. *Xanthium strumarium*	5	No	FAC
3. *Carex intumescens*	5	No	FACW
4. *Carex sp.*	5	No	
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	=Total Cover	

50% of total cover: 18 20% of total cover: 7

Woody Vine Stratum (Plot size: 30)

Woody Vine Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	

50% of total cover: ______ 20% of total cover: ______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	30 (A)		45 (B)

Prevalence Index = B/A = 1.50

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W030a - Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 4/6	100					Loamy/Clayey	
6-20	10YR 4/2	90	10YR 4/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence Sampling Date: 8/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W030a - Up
Investigator(s): Paul Bright, Ethan Lawton Section, Township, Range: ____
Landform (hillside, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 0-1
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.651216 Long: -87.222343 Datum: NAD 83
Soil Map Unit Name: Etowah loam, eroded, undulating phase NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W030a. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was found at this site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W030a - Up

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Glycine max*	85	Yes	UPL
2. *Solidago altissima*	5	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover: 45		20% of total cover:	18

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	85	x 5 =	425
Column Totals:	90 (A)		445 (B)

Prevalence Index = B/A = 4.94

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was not observed at this site.

SOIL

Sampling Point: W030a - Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-20	5YR 4/6	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was observed.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/8/23
Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W030b - Wet
Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.649442 Long: 87.217845 Datum: WGS84
Soil Map Unit Name: Ob- Ooltewah silt loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W030b. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
X Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
X Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
X Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 1

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology indicators were found at the sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W030b - Wet

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis laevigata*	20	Yes	FACW
2. *Liquidambar styraciflua*	20	Yes	FAC
3. *Quercus phellos*	10	Yes	FAC
4.			
5.			
6.			
7.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10
Sapling/Shrub Stratum (Plot size: 30)			
1. *Ligustrum sinense*	20	Yes	FACU
2. *Celtis laevigata*	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6
Herb Stratum (Plot size: 5)			
1. *Smilax rotundifolia*	10	Yes	FAC
2. *Parthenocissus quinquefolia*	5	No	FACU
3. *Impatiens capensis*	10	Yes	FACW
4. *Toxicodendron radicans*	10	Yes	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover:	7
Woody Vine Stratum (Plot size: 30)			
1. *Ampelopsis arborea*	10	Yes	FACW
2. *Campsis radicans*	10	Yes	FAC
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was found at the sample site.

SOIL

Sampling Point: W030b - Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	90	5YR 4/6	10	C	M	Loamy/Clayey	
6-20	10YR 7/1	85	5YR 4/6	15	C	PL	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** _X_ **No** ___

Remarks:
Redox was found in the pore linings of the soil sample.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/7/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W030b - Up

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.649691 Long: 87.217713 Datum: WGS84

Soil Map Unit Name: Dc- Decatur silty clay loam NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W030b. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was not found at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W030b - Up

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Gossypium hirsutum*	75	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	=Total Cover	
50% of total cover:	38	20% of total cover:	15

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
The surrounding area of the wetland was an upalnd cotton field.

SOIL

Sampling Point: W030b - Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-20	5YR 4/6	100						clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)

___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ___ **No** X

Remarks:
No hydric soil was found at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/7/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W031

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ______

Landform (hillside, terrace, etc.): toe slope Local relief (concave, convex, none): concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.649967 Long: 87.215655 Datum: WGS84

Soil Map Unit Name: Ra- Robertsville silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W031. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was present at the sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W031

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus phellos*	10	Yes	FAC
2. *Acer rubrum*	15	Yes	FAC
3. *Nyssa sylvatica*	10	Yes	FAC
4. *Salix nigra*	10	Yes	OBL
5.			
6.			
7.			
	45	=Total Cover	
50% of total cover: 23		20% of total cover: 9	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	10	Yes	FAC
2. *Nyssa sylvatica*	10	Yes	FAC
3. *Quercus phellos*	10	Yes	FAC
4. *Ligustrum sinense*	10	Yes	FACU
5. *Styrax americanus*	15	Yes	OBL
6.			
7.			
8.			
9.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover: 11	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Saururus cernuus*	40	Yes	OBL
2. *Juncus effusus*	10	No	FACW
3. *Smilax rotundifolia*	10	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60	=Total Cover	
50% of total cover: 30		20% of total cover: 12	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was found at this sample site.

SOIL

Sampling Point: W031

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Loamy/Clayey	
2-4	10YR 4/2	95	5YR 4/6	5	C	PL	Loamy/Clayey	
4-20	10YR 4/2	20	7.5YR 4/6	80			Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
? Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
X Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Iron-manganese masses were found in this soil sample.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/7/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W032

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): toe slope Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.654735 Long: 87.210820 Datum: WGS84

Soil Map Unit Name: Ra- Robertsville silt loam; Ob- Ooltewah silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of W032. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
X Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
X Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was present at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W032

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	15	Yes	FAC
2. *Quercus nigra*	20	Yes	FAC
3. *Platanus occidentalis*	15	Yes	FACW
4. *Ulmus americana*	5	No	FACW
5.			
6.			
7.			
	55	=Total Cover	
50% of total cover: 28		20% of total cover: 11	
Sapling/Shrub Stratum (Plot size: 30)			
1. *Ligustrum sinense*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover: 2	
Herb Stratum (Plot size: 5)			
1. *Toxicodendron radicans*	10	Yes	FAC
2. *Parthenocissus quinquefolia*	10	Yes	FACU
3. *Ampelopsis arborea*	15	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover: 7	
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover: 4	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation was found at the sample site.

SOIL

Sampling Point: W032

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-6	10YR 3/2	100					Loamy/Clayey	
6-20	7.5YR 4/2	40	10YR 4/4	60	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** X **No** ____

Remarks:
Hydric soil was found at the sample site.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/7/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W032

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.655010 Long: 87.210916 Datum: WGS84

Soil Map Unit Name: Dc- Decatur silty clay loam NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present? Yes ___ No X		
Wetland Hydrology Present? Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W032. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)	
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)	
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)	
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)	
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)	
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)	
___ Iron Deposits (B5)		
___ Inundation Visible on Aerial Imagery (B7)		
___ Water-Stained Leaves (B9)		
___ Aquatic Fauna (B13)		

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was not found at this sample site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W032

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Gossypium hirsutum*	75	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	=Total Cover	
50% of total cover:	38	20% of total cover:	15
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
The surrounding area of the wetland was an upalnd cotton field.

SOIL

Sampling Point: W032

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	5YR 4/6	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
No hydric soil was found at the sample site.

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/7/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W033

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.650144 Long: 87.211103 Datum: WGS84

Soil Map Unit Name: Ob- Ooltewah silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:
This data point is representative of W033. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- X Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was observed at the site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W033

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	30	Yes	FAC
2. *Quercus phellos*	20	Yes	FAC
3. *Ulmus americana*	15	Yes	FACW
4.			
5.			
6.			
7.			
	65	=Total Cover	
50% of total cover: 33		20% of total cover:	13

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	10	Yes	FAC
2. *Ulmus americana*	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	20	=Total Cover	
50% of total cover: 10		20% of total cover:	4

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	15	Yes	FAC
2. *Campsis radicans*	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover:	6

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
The vegetation in this sample site passed the dominance test.

SOIL

Sampling Point: W033

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Loamy/Clayey	
6-20	10YR 4/2	90	5YR 4/6	10	C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- X Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydric soil was observed at this sample site.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro City/County: Decatur/Lawrence Sampling Date: 8/7/23

Applicant/Owner: Urban Grid/TVA State: AL Sampling Point: W033

Investigator(s): HDR, Inc.; M. Inman, R. Riley Section, Township, Range:

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N Lat: 34.649830 Long: 87.210994 Datum: WGS84

Soil Map Unit Name: Ob- Ooltewah silt loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?**	**Yes** ___ **No** X
Hydric Soil Present?	Yes ___ No X		
Wetland Hydrology Present?	Yes ___ No X		

Remarks:
This data point is representative of uplands adjacent to W033. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___	
Water Table Present?	Yes ___	No X	Depth (inches): ___	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___	**Wetland Hydrology Present?** **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No wetland hydrology was observed at the upland site.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W033

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Liquidambar styraciflua*	40	Yes	FAC
2. *Ulmus americana*	20	Yes	FACW
3. *Pinus taeda*	10	No	FAC
4.			
5.			
6.			
7.			
	70	=Total Cover	
50% of total cover: 35		20% of total cover: 14	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	20	Yes	FAC
2. *Ulmus americana*	10	Yes	FACW
3. *Liquidambar styraciflua*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
	35	=Total Cover	
50% of total cover: 18		20% of total cover: 7	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Toxicodendron radicans*	10	Yes	FAC
2. *Ampelopsis arborea*	10	Yes	FACW
3. *Smilax rotundifolia*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	30	=Total Cover	
50% of total cover: 15		20% of total cover: 6	

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Most vegetation found at the sample site was facultative.

SOIL

Sampling Point: W033

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/4	100						clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Hydric soil was not found at the sample site.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/9/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W034
Investigator(s): L. Thiem & E. Lawton Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.788528 Long: -87.379491 Datum: NAD 83
Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes NWI classification: PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation x , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes x No ___	
Wetland Hydrology Present?	Yes x No ___	

Remarks:
PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	x Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
x Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
x Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W034

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 30)			
1. *Polygonum hydropiperoides*	10	No	OBL
2. *Murdannia keisak*	40	Yes	OBL
3. *Junsus effusus*	5	No	FACW
4. *Ranunculus abortivus*	2	No	FACW
5. *Pycnanthemum flexuosum*	2	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	59	=Total Cover	
50% of total cover:	30	20% of total cover:	12

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	9	x 2 =	18
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	59 (A)		68 (B)

Prevalence Index = B/A = 1.15

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation disturbed by TVA ROW clearing

SOIL

Sampling Point: W034

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	90	7.5YR 4/6	10	C	PL	Loamy/Clayey	loamy clay
12-20	10YR 4/2	90	7.5YR 5/8	10	C	PL	Loamy/Clayey	loamy clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** x **No** ___

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/9/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W034
Investigator(s): L. Thiem & E. Lawton Section, Township, Range: ____
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.788588 Long: -87.379405 Datum: NAD 83
Soil Map Unit Name: Roberstville (Ketona) silt loam, 0 to 2 percent slopes NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil x, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No ___
Hydric Soil Present?	Yes ___	No x
Wetland Hydrology Present?	Yes ___	No x

Is the Sampled Area within a Wetland? **Yes** ___ **No** x

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W034

Tree Stratum (Plot size: 30)

		Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
6.				
7.				
			=Total Cover	

50% of total cover: ____ 20% of total cover: ____

Sapling/Shrub Stratum (Plot size: 30)

1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
			=Total Cover	

50% of total cover: ____ 20% of total cover: ____

Herb Stratum (Plot size: 30)

1.	*Solidago altissima*	20	Yes	FACU
2.	*Rubus sp.*	10	No	FAC
3.	*Phytolacca americana*	2	No	FACU
4.	*Grass sp.*	20	Yes	FAC
5.	*Toxicodendron radicans*	5	No	FAC
6.	*Conoclinium coelestinum*	5	No	FAC
7.	*Eupatorium perfoliatum*	5	No	FACW
8.				
9.				
10.				
11.				
		67	=Total Cover	

50% of total cover: 34 20% of total cover: 14

Woody Vine Stratum (Plot size: 30)

1.				
2.				
3.				
4.				
5.				
			=Total Cover	

50% of total cover: ____ 20% of total cover: ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	40	x 3 =	120
FACU species	22	x 4 =	88
UPL species	0	x 5 =	0
Column Totals:	67 (A)		218 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W034

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 5/4	98	10YR 5/8	2	C	PL	Loamy/Clayey	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** x

Remarks:
restrictive layer at 10"

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W035
Investigator(s): L. Thiem & E. Lawton Section, Township, Range:
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.765398 Long: -87.359216 Datum: NAD 83
Soil Map Unit Name: Etowah silty clay loam, 2 to 6 percent NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil x, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes ___	No x	
Wetland Hydrology Present?	Yes x	No ___	

Remarks:
Isolated non-jurisdictional PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
x Geomorphic Position (D2)
___ Shallow Aquitard (D3)
x Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W035

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 30)			
1. *Leersia virginica*	80	Yes	FACW
2. *Alopecurus carolinianus*	5	No	FACW
3. *Microstegium vimineum*	5	No	FAC
4. *Lathyrus sp.*	2	No	FAC
5. *Valerianella radiata*	2	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	94	=Total Cover	
50% of total cover:	47	20% of total cover:	19

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	9	x 3 =	27
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	94 (A)		197 (B)

Prevalence Index = B/A = 2.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W035

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 6/4	90	10YR 5/8	10	C	M	Loamy/Clayey	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:
soils disturbed by tilling

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/10/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W035
Investigator(s): L. Thiem & E. Lawton Section, Township, Range: ____
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.765355 Long: -87.359111 Datum: NAD 83
Soil Map Unit Name: Etowah silt loam, 2 to 6 percent slopes, eroded NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No x	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** x
Hydric Soil Present?	Yes ____ No x		
Wetland Hydrology Present?	Yes ____ No x		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ True Aquatic Plants (B14)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No x	Depth (inches): ____
Water Table Present?	Yes ____	No x	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No x	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W035

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 30)			
1. *Zea mays*	80	Yes	UPL
2. *Lezpedeza cuneata*	10	No	FACU
3. *Ipomoea jaegeri*	5	No	
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95	=Total Cover	
50% of total cover:	48	20% of total cover:	19

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	80	x 5 =	400
Column Totals:	90 (A)		440 (B)

Prevalence Index = B/A = 4.89

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W035

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 4/4	100					Loamy/Clayey	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:
soils disturbed by tilling

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-xxxx, Exp: Pending* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Courtland / Lawrence County Sampling Date: 10/9/23

Applicant/Owner: Urban Grid State: ______ Sampling Point: W036

Investigator(s): Johanna Velasquez / Rebekkah Riley Section, Township, Range: ______

Landform (hillside, terrace, etc.): toe of slope Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.695138 Long: -87.287564 Datum: NAD 83

Soil Map Unit Name: Ooltewah silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes** X **No** ___
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:
This data point is representative of Wetland 036. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	X Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X Microtopographic Relief (D4)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland Hydrology is present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W036

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Herb Stratum (Plot size: 5)			
1. *Typha latifolia*	20	Yes	OBL
2. *carex lurida*	20	Yes	OBL
3. *Polygonum pensylvanicum*	20	Yes	FACW
4. *solidago altissima*	30	Yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	=Total Cover	
50% of total cover:	45	20% of total cover:	18
Woody Vine Stratum (Plot size: 30)			
1. *Smilax rotundifolia*	20	Yes	FAC
2. *Cardiospermum halicacabum*	30	Yes	FACU
3.			
4.			
5.			
	50	=Total Cover	
50% of total cover:	25	20% of total cover:	10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	20	x 2 =	40
FAC species	20	x 3 =	60
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	140 (A)		380 (B)

Prevalence Index = B/A = 2.71

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W036

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 4/2	85	5YR 5/6	15	C	M	Loamy/Clayey	Prominent redox concentrations
12-18	7.5YR 5/1	60	7.5YR 5/3	40	C	M	Loamy/Clayey	Distinct redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:
Hydrolic Soil is present.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Courtland / Lawrence County Sampling Date: 10/9/23

Applicant/Owner: urban Grid State: AL Sampling Point: W036

Investigator(s): Johanna Velasquez / Rebekkah Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): toe of slope Local relief (concave, convex, none): None Slope (%): 0-1

Subregion (LRR or MLRA): LRR N, MLRA 128 Lat: 34.696415 Long: -87.288890 Datum: NAD 83

Soil Map Unit Name: Ooltewah silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X		

Remarks:
This data point is representative of uplands adjacent to Wetland 036. Per the USACE's antecedent precipitation tool, climactic and hydrologic conditions in the area were normal for this time of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ True Aquatic Plants (B14)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)
___ Saturation (A3)	___ Oxidized Rhizospheres on Living Roots (C3)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)
___ Iron Deposits (B5)	
___ Inundation Visible on Aerial Imagery (B7)	
___ Water-Stained Leaves (B9)	
___ Aquatic Fauna (B13)	

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No hydrology present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W036

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 15)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 5)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alopecurus carolinianus*	10	Yes	FACW
2. *Trifolium repens*	20	Yes	FACU
3. *Ipomoea purpurea*	20	Yes	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50	=Total Cover	
50% of total cover:	25	20% of total cover:	10

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Campsis radicans*	20	Yes	FAC
2.			
3.			
4.			
5.			
	20	=Total Cover	
50% of total cover:	10	20% of total cover:	4

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	10	x 2 = 20
FAC species	20	x 3 = 60
FACU species	20	x 4 = 80
UPL species	20	x 5 = 100
Column Totals:	70 (A)	260 (B)

Prevalence Index = B/A = 3.71

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W036

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5YR 4/4	100			C	M	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Hydrolic soil is not present.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/9/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W037
Investigator(s): L. Thiem Section, Township, Range:
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.682768 Long: -87.267827 Datum: NAD 83
Soil Map Unit Name: Abernathy-Emory silt loams, 0 to 2 percent slopes NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil x, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes ___ No x	
Wetland Hydrology Present?	Yes x No ___	

Remarks:
Non-jurisdictional PEM wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
x Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
x FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W037

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 30)			
1. *Alopecurus carolinianus*	90	Yes	FACW
2. *Lespedeza cuneata*	10	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	100 (A)		220 (B)

Prevalence Index = B/A = 2.20

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W037

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-20	7.5YR 4/4	100					Loamy/Clayey	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Soils highly disturbed by agriculture tilling

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/9/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W037
Investigator(s): L. Thiem Section, Township, Range: ____
Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.682650 Long: -87.267632 Datum: NAD 83
Soil Map Unit Name: Abernathy-Emory silt loam, 0-2 percent slopes NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil x, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No x
Hydric Soil Present?	Yes ___	No x
Wetland Hydrology Present?	Yes ___	No x

Is the Sampled Area within a Wetland? **Yes** ___ **No** x

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W037

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Herb Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Zea mays*	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20

Woody Vine Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	100	x 5 =	500
Column Totals:	100 (A)		500 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W037

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-20	7.5YR 4/4	100					Loamy/Clayey	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Mucky Mineral (F1) **(MLRA 136)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 122, 136)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region** See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp:11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/11/23

Applicant/Owner: Urban Grid State: AL Sampling Point: W038

Investigator(s): L. Thiem & R. Riley Section, Township, Range: ____

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2-5

Subregion (LRR or MLRA): LRR N Lat: 34.677917 Long: 87.232067 Datum: NAD 83

Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: PFO1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil x, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___

Are Vegetation ___, Soil x, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes ___ No x	
Wetland Hydrology Present?	Yes x No ___	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- x Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- x Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W038

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	5	No	OBL
2. *Liquidambar styraciflua*	20	Yes	FAC
3. *Nyssa sylvatica*	20	Yes	FAC
4. *Quercus nigra*	5	No	FAC
5.			
6.			
7.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover: 10	
Sapling/Shrub Stratum (Plot size: 30)			
1. *Liquidambar styraciflua*	5	Yes	FAC
2. *Nyssa sylvatica*	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover: 2	
Herb Stratum (Plot size: 30)			
1. *Eutrochium purpureum*	2	No	FAC
2. *Polygonum hydropiperoides*	10	Yes	OBL
3. *Microstegium vimineum*	10	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	22	=Total Cover	
50% of total cover: 11		20% of total cover: 5	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	0	x 2 =	0
FAC species	67	x 3 =	201
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	82 (A)		216 (B)

Prevalence Index = B/A = 2.63

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W038

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 3/3	100					Loamy/Clayey	loam
6-20	7.5YR 4/6	100					Loamy/Clayey	clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:
Soils disturbed and naturally problematic

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region
See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp:11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Hillsboro Solar City/County: Lawrence County Sampling Date: 10/11/23
Applicant/Owner: Urban Grid State: AL Sampling Point: W038
Investigator(s): L. Thiem & R. Riley Section, Township, Range: ____
Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR N Lat: 34.677703 Long: -87.231825 Datum: NAD 83
Soil Map Unit Name: Robertsville (Ketona) silt loam, 0 to 2 percent slopes, occasionally ponded NWI classification: PFO1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No x	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** x
Hydric Soil Present?	Yes ___ No x	
Wetland Hydrology Present?	Yes ___ No x	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No x	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: W038

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus rubra*	5	No	FACU
2. *Carya tomentosa*	20	Yes	UPL
3. *Liquidambar styraciflua*	10	Yes	FAC
4. *Juglans nigra*	5	No	FACU
5. *Quercus montana*	10	Yes	UPL
6.			
7.			
	50	=Total Cover	
50% of total cover: 25		20% of total cover:	10
Sapling/Shrub Stratum (Plot size: 30)			
1. *Ligustrum japonica*	10	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2
Herb Stratum (Plot size: 30)			
1. *Erigeron annuus*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2
Woody Vine Stratum (Plot size: 30)			
1. *Lonicera japonica*	5	Yes	FACU
2. *Smilax rotundifolia*	5	Yes	FAC
3.			
4.			
5.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover:	2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	25	x 4 =	100
UPL species	40	x 5 =	200
Column Totals:	80 (A)		345 (B)

Prevalence Index = B/A = 4.31

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W038

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/4	100					Loamy/Clayey	loam
2-20	10YR 3/4	70	7.5YR 4/6	30		M	Loamy/Clayey	loam, dual matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ 2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Mucky Mineral (F1) **(MLRA 136)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 122, 136)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
___ Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** x

Remarks:

Site: UG Hillsboro - W001	Rater(s): E Lawton	Date: 8/7/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

2	4
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

13	17
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- [x] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [ ] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

12	29
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.

- [ ] None or none apparent (9)
- [x] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

29

Site: UG Hillsboro - W001	**Rater(s):** E Lawton	**Date:** 8/7/23

29
subtotal previous page

5	34
max 10 pts.	subtotal

5
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [x] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8	42
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [x] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [x] Nearly absent <5% cover (0)
- [ ] Absent (1)

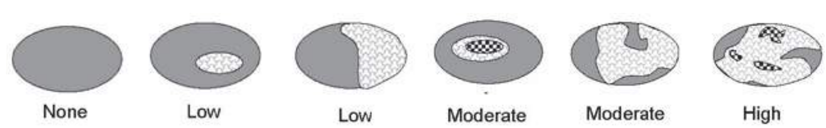
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [1] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

42

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W002	Rater(s): E Lawton	Date: 8/7/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	11
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

21	32
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☑ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☑ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

13	45
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☑ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☑ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☑ nutrient enrichment

45

Site:	UG Hillsboro - W002	Rater(s):	E Lawton	Date:	8/7/23

45
subtotal previous page

5	50
max 10 pts.	subtotal

5
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [x] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only “historic”]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

11	61
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [2] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland’s vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland’s vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland’s vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [x] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [x] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

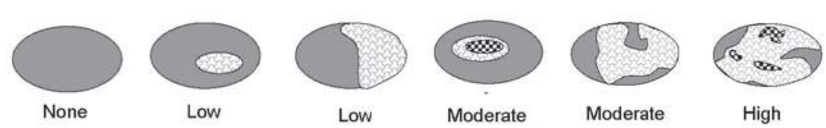
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [3] Standing dead >25 cm (10 in.) dbh
- [2] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

61

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W003	Rater(s): E Lawton	Date: 8/7/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	10
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

11	21
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [x] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

12	33
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [x] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

33

Site:	UG Hillsboro - W003	Rater(s):	E Lawton	Date:	8/7/23

33
subtotal previous page

5	38
max 10 pts.	subtotal

5
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [x] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

7	45
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [x] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [x] Nearly absent <5% cover (0)
- [ ] Absent (1)

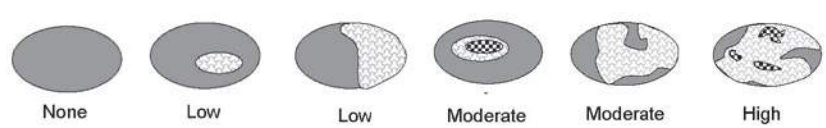
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

45 **GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W004	Rater(s): E Lawton	Date: 8/7/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	11
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

20	31
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☑ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☑ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

11	42
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☑ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☑ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☑ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

42

Site:	UG Hillsboro - W004	Rater(s):	E Lawton	Date:	8/7/23

42
subtotal previous page

0	42
max 10 pts.	subtotal

Metric 5. Special Wetlands

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

4	46
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- 2 Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ✓ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ✓ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

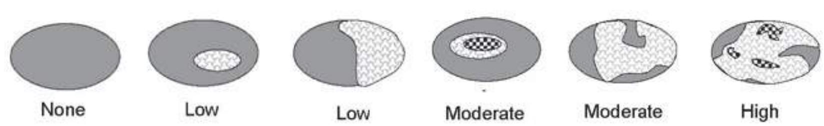
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- 2 Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

46

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W005a	Rater(s): E Lawton	Date: 8/8/23

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [x] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

16	25
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [x] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

7	32
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

32

Site:	UG Hillsboro - W005a	Rater(s):	E Lawton	Date:	8/8/23

32
subtotal previous page

0	32
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

4	36
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [x] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [x] Nearly absent <5% cover (0)
- [ ] Absent (1)

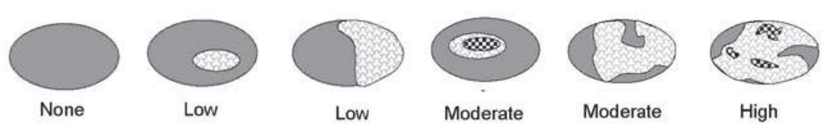
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [2] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

36

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W005b	Rater(s): E Lawton	Date: 8/8/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☑ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	10
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

15	25
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☑ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☑ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

13	38
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☑ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☑ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

38

Site:	UG Hillsboro - W005b	**Rater(s):**	E Lawton	**Date:**	8/8/23

38
subtotal previous page

0	38
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only “historic”]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

3	41
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.
- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale
- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland’s vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland’s vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland’s vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.
- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

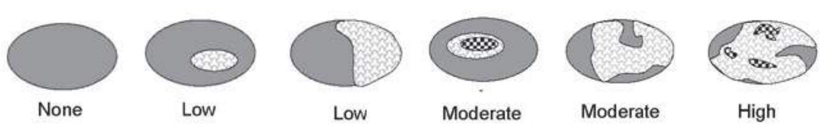
Narrative Description of Vegetation Quality
- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.
- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

Mudflat and Open Water Class Quality
- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.
- [ ] Vegetated hummocks/tussocks
- [1] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale
- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

41

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W006	Rater(s): E Lawton	Date: 8/11/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [x] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	11
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

25	36
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [x] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [x] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

19	55
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [x] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [x] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

55

Site: UG Hillsboro - W006	Rater(s): E Lawton	Date: 8/11/23

55
subtotal previous page

5	60
max 10 pts.	subtotal

5
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only “historic”]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8	68
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland’s vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland’s vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland’s vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

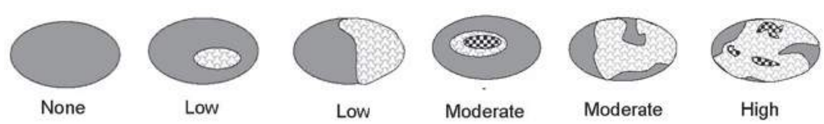
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [2] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [3] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

68

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W007	Rater(s): E Lawton	Date: 8/10/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	11
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

22	33
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☑ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☑ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ___________________

14	47
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☑ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☑ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☑ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

47

Site:	UG Hillsboro - W007	**Rater(s):**	E Lawton	**Date:**	8/10/23

47
subtotal previous page

5	52
max 10 pts.	subtotal
5	
raw score*	

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

10	62
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [1] Aquatic bed
- [1] Emergent
- [2] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [✓] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

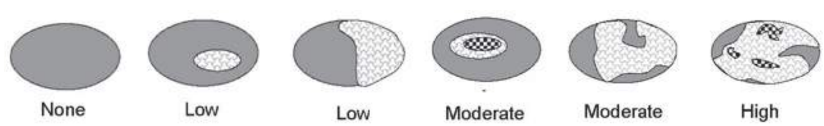
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [1] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [3] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

62	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHOROITY RAPID ASSESSMENT MEHTOD: Assessing Wetland Condition, Functional Capacity, Quality

TVARAM FIELD FORM

Site: UG Hillsboro - W008	**Rater(s):** E Lawton	**Date:** 8/10/23

5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.

- ☐ >50 acres (>20.2 ha) (6 pts)
- ☑ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	13
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

25	38
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.

- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☑ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☑ Part of wetland/upland (e.g., forest), complex (1)
- ☑ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 m (27.6 in.) (3)
- ☑ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.

- ☑ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

☐ ditch	☐ point source (nonstormwater)
☐ tile (including culvert)	☐ filling/grading
☑ dike	☐ road bed/RR track
☐ weir	☐ dredging
☐ stormwater input	☐ other ___________________

16	54
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.

- ☑ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☑ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed

☐ mowing	☑ shrub/sapling removal
☐ grazing	☐ herbaceous/aquatic bed removal
☐ clearcutting	☐ woody debris removal
☐ selective cutting	☐ sedimentation
☐ farming	☐ dredging
☐ toxic pollutants	☐ nutrient enrichment

54

Site: UG Hillsboro - W008	Rater(s): E Lawton	Date: 8/10/23

54
subtotal previous page

8	62
max 10 pts.	subtotal

8
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ✓ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ✓ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

19	81
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- 2 Aquatic bed
- 3 Emergent
- ☐ Shrub
- 3 Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ✓ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ✓ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

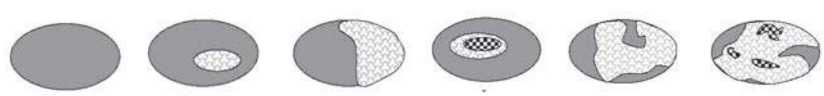
Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- 3 Coarse woody debris >15 cm (6 in.)
- 3 Standing dead >25 cm (10 in.) dbh
- 3 Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

81	GRAND TOTAL (max 100 pts)

- 0 29 = Category 1, low wetland function, condition, quality**
- 30- 59 = Category 2, good/moderate wetland function, condition, quality**
- 60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W009	Rater(s): E Lawton	Date: 8/8/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	10
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

11	21
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [x] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other drained

7	28
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

28

Site:	UG Hillsboro - W009	Rater(s):	E Lawton	Date:	8/8/23

28
subtotal previous page

5	33
max 10 pts.	subtotal

5
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [x] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
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4	37
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [3] Emergent
- [ ] Shrub
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- [ ] Mudflats
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Vegetation Community Cover Scale

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6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [x] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
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- [ ] Sparse 5-25% cover (-1)
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Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
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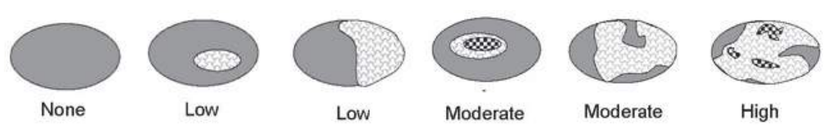
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

37

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W010	Rater(s): E Lawton	Date: 8/8/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☑ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	10
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

11	21
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☑ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other draining

7	28
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☑ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☑ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

28

Site:	UG Hillsboro - W010	Rater(s):	E Lawton	Date:	8/8/23

28
subtotal previous page

5	33
max 10 pts.	subtotal

5
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

4	37
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [✓] Nearly absent <5% cover (0)
- [ ] Absent (1)

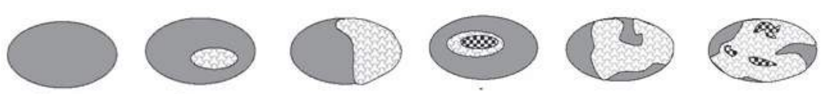
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

37

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W011	Rater(s): E Lawton	Date: 8/8/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	10
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

20	30
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [x] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [x] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

8	38
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [x] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

38

TENNESSEE VALLEY AUTHOROITY RAPID ASSESSMENT MEHTOD: Assessing Wetland Condition, Functional Capacity, Quality
TVARAM FIELD FORM

Site:	UG Hillsboro - W011	Rater(s):	E Lawton	Date:	8/8/23

38
subtotal previous page

0 (max 10 pts.) | 38 (subtotal)

Metric 5. Special Wetlands

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

5 (max 20 pts.) | 43 (subtotal)

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [2] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

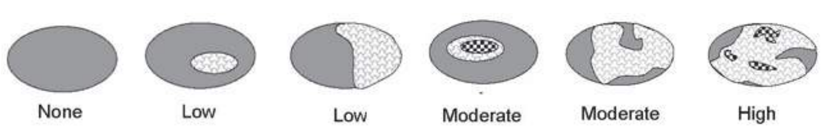
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [1] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

43

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W012	Rater(s): E Lawton	Date: 8/9/23

4	4
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☑ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

5	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☑ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

14	23
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☑ road bed/RR track
- ☐ dredging
- ☐ other ____________________

18	41
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☑ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☑ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☑ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

41

Site:	UG Hillsboro - W012	Rater(s):	E Lawton	Date:	8/9/23

41
subtotal previous page

8	49
max 10 pts.	subtotal

8
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [✓] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6	55
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [✓] Nearly absent <5% cover (0)
- [ ] Absent (1)

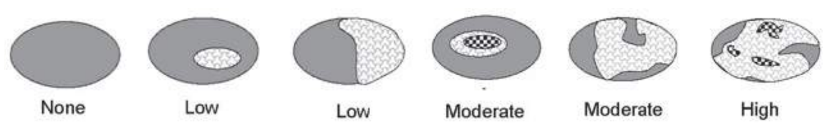
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

55

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W013	Rater(s): Ben B.	Date: 8/15/23

5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [x] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

4	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

18	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [x] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [ ] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other Transmission ROW

14	41
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [x] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [x] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

41

Site: Hillsboro Solar - W013	Rater(s): Ben B.	Date: 8/15/23

41
subtotal previous page

10	51
max 10 pts.	subtotal

13
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ✓ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ✓ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

9	60
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- [1] Emergent
- ☐ Shrub
- [3] Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ✓ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ✓ Nearly absent <5% cover (0)
- ☐ Absent (1)

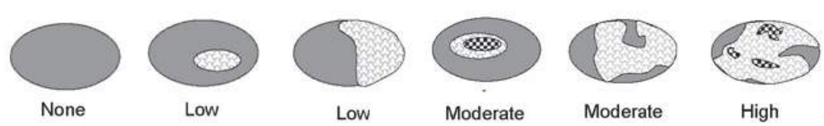
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [1] Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

60

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W014	Rater(s): Ben B.	Date: 8/15/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☑ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

4	6
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☑ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☑ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

16	22
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☑ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

14	36
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☑ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☑ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

36

Site: Hillsboro Solar - W014	Rater(s): Ben B.	Date: 8/15/23

36
subtotal previous page

10	46
max 10 pts.	subtotal

13
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☑ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☑ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8	54
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- [3] Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☑ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☑ Nearly absent <5% cover (0)
- ☐ Absent (1)

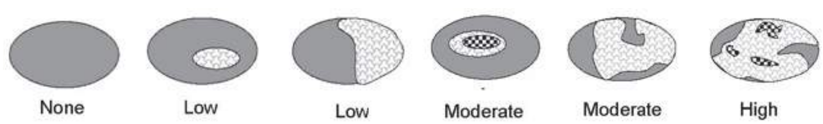
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [1] Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

54	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W015	**Rater(s):** P. Bright	**Date:** 8/10/23

4	4
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☑ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

5	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☑ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

25	34
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☑ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☑ Part of wetland/upland (e.g., forest), complex (1)
- ☑ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☑ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☑ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

16	50
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☑ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☑ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☑ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

50

Site: UG Hillsboro - W015	Rater(s): P. Bright	Date: 8/10/23

50
subtotal previous page

8 (max 10 pts.) | 58 (subtotal)
8 (raw score*)

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [✓] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

19 (max 20 pts.) | 77 (subtotal)

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [2] Aquatic bed
- [3] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [✓] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

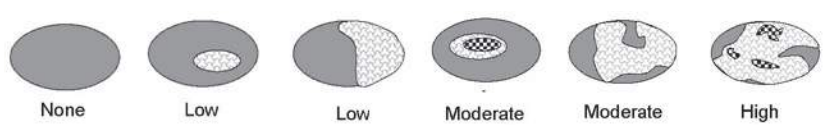
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [3] Coarse woody debris >15 cm (6 in.)
- [3] Standing dead >25 cm (10 in.) dbh
- [3] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

77

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W016	Rater(s): P. Bright	Date: 8/10/23

5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [x] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

2	7
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

25	32
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [x] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

12	44
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [x] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [x] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

44

Site:	UG Hillsboro - W016	Rater(s):	P. Bright	Date:	8/10/23

44
subtotal previous page

0	44
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8	52
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [3] Emergent
- [ ] Shrub
- [1] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [x] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [x] Nearly absent <5% cover (0)
- [ ] Absent (1)

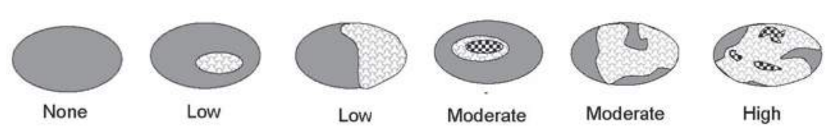
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [1] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

52

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W017	Rater(s): P. Bright	Date: 8/15/23

5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☑ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

4	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☑ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☑ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

23	32
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☑ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☑ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☑ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☐ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☑ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other Transmission ROW

14	46
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☑ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☑ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

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TENNESSEE VALLEY AUTHOROITY RAPID ASSESSMENT MEHTOD: Assessing Wetland Condition, Functional Capacity, Quality
TVARAM FIELD FORM

Site: Hillsboro Solar - W017	**Rater(s):** P. Bright	**Date:** 8/15/23

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subtotal previous page

10	56
max 10 pts.	subtotal
13	
raw score*	

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [✓] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

9	60
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [✓] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [✓] Nearly absent <5% cover (0)
- [ ] Absent (1)

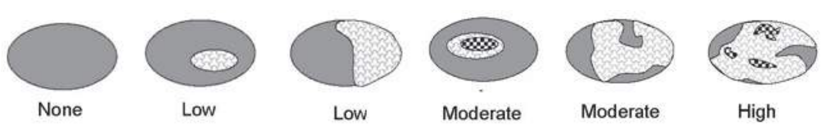
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [1] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

60	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W018	Rater(s): M. Inman, R. Riley	Date: 8/9/23

Metric 1. Wetland Area (size)

3	3
max 6 pts.	subtotal

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [x] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

Metric 2. Upland Buffers and Surrounding Land Use

8	11
max 14 pts.	subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

Metric 3. Hydrology

16	27
max 30 pts.	subtotal

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

Metric 4. Habitat Alteration and Development

13	40
max 20 pts.	subtotal

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [x] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

40

Site:	Hillsboro Solar - W018	Rater(s):	M. Inman, R. Riley	Date:	8/9/23

40
subtotal previous page

5	45
max 10 pts.	subtotal

Metric 5. Special Wetlands

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☑ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

9	54
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- 3 Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☑ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☑ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

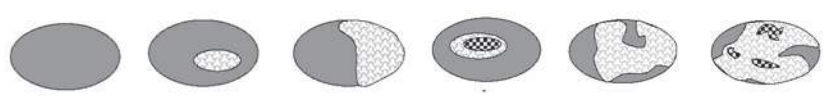
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- 3 Coarse woody debris >15 cm (6 in.)
- 3 Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

54	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W019	Rater(s): M. Inman, R. Riley	Date: 8/9/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	11
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

16	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

13	40
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☑ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☑ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

40

Site: Hillsboro Solar - W019	**Rater(s):** M. Inman, R. Riley	**Date:** 8/9/23

40
subtotal previous page

Metric 5. Special Wetlands

5	45
max 10 pts.	subtotal

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [x] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

9	54
max 20 pts.	subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [x] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [x] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

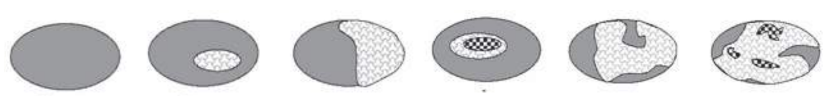
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [3] Coarse woody debris >15 cm (6 in.)
- [3] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

54

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W020	Rater(s): J. Irvin	Date: 8/14/23

5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☑ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

4	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☑ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☑ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

12	21
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☑ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

12	33
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☑ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☑ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☑ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

33

Site: Hillsboro Solar - W020	Rater(s): J. Irvin	Date: 8/14/23

33
subtotal previous page

10	43
max 10 pts.	subtotal

13
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [✓] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8	51
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [✓] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [✓] Nearly absent <5% cover (0)
- [ ] Absent (1)

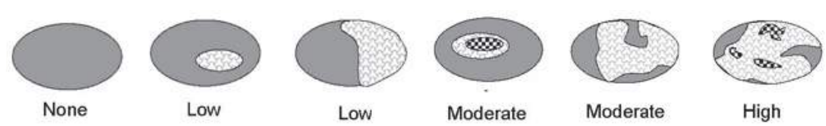
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [1] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

51

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W021	Rater(s): J. Irvin	Date: 8/14/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

1	3
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [x] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

8	11
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [ ] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

4	15
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [x] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

15

Site: Hillsboro Solar - W021	Rater(s): J. Irvin	Date: 8/14/23

15
subtotal previous page

3	18
max 10 pts.	subtotal

3
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [✓] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6	24
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

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3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
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6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [✓] Nearly absent <5% cover (0)
- [ ] Absent (1)

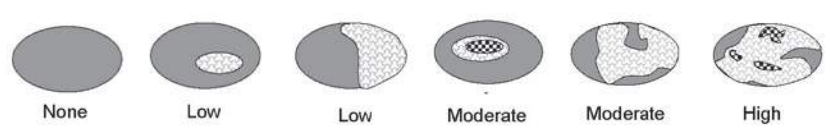
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [1] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

24	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W022	Rater(s): J. Irvin	Date: 8/14/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☑ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

1	3
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☑ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

8	11
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☐ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☑ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☑ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

4	15
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☑ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☑ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☑ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

15

Site: Hillsboro Solar - W022	Rater(s): J. Irvin	Date: 8/14/23

15
subtotal previous page

3	18
max 10 pts.	subtotal

3
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ✓ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6	24
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- 2 Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other _____________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ✓ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ✓ Nearly absent <5% cover (0)
- ☐ Absent (1)

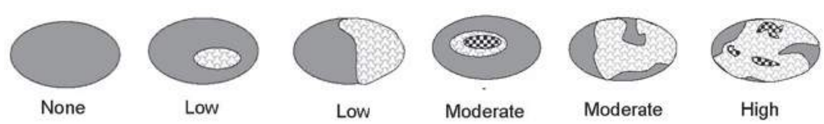
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- 2 Coarse woody debris >15 cm (6 in.)
- 1 Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

24

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W023	**Rater(s):** J. Irvin	**Date:** 8/14/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

1	3
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [x] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

8	11
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [ ] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

4	15
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [x] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

15

Site:	Hillsboro Solar - W023	**Rater(s):**	J. Irvin	**Date:**	8/14/23

15
subtotal previous page

3	18
max 10 pts.	subtotal

3
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ✓ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6	24
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- 2 Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ✓ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ✓ Nearly absent <5% cover (0)
- ☐ Absent (1)

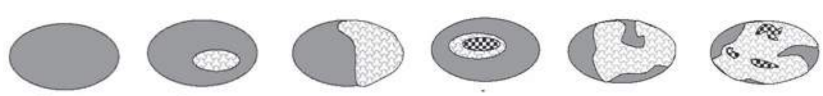
Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- 2 Coarse woody debris >15 cm (6 in.)
- 1 Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

24	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W024	Rater(s): J. Irvin	Date: 8/14/23

5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [x] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

9	14
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [x] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

16	30
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [ ] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [x] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [x] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [ ] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [x] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

17	47
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [x] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

47

Site: Hillsboro Solar - W024	Rater(s): J. Irvin	Date: 8/14/23

47
subtotal previous page

10	57
max 10 pts.	subtotal

13
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [✓] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [✓] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only “historic”]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

9	66
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland’s vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland’s vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland’s vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [✓] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [✓] Nearly absent <5% cover (0)
- [ ] Absent (1)

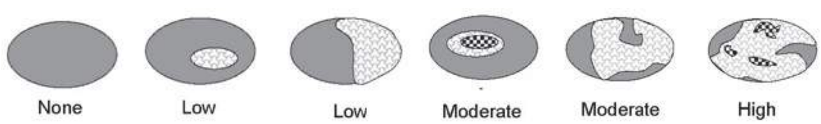
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [1] Coarse woody debris >15 cm (6 in.)
- [1] Standing dead >25 cm (10 in.) dbh
- [1] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

66

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W025	Rater(s): J. Irvin	Date: 8/14/23

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☑ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

6	6
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☑ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☑ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

9	15
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☑ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

5	20
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☑ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☑ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☑ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

20

Site:	Hillsboro Solar - W025	Rater(s):	J. Irvin	Date:	8/14/23

20
subtotal previous page

0	20
max 10 pts.	subtotal

Metric 5. Special Wetlands

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

0	20
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☑ None (0)

Narrative Description of Vegetation Quality

- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☑ Nearly absent <5% cover (0)
- ☐ Absent (1)

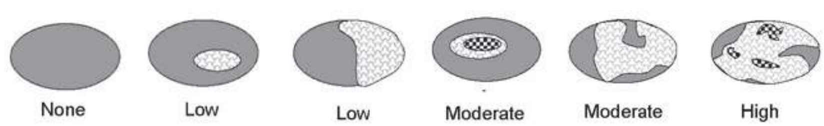
Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

20

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHOROITY RAPID ASSESSMENT MEHTOD: Assessing Wetland Condition, Functional Capacity, Quality

TVARAM FIELD FORM

Site: Hillsboro Solar - W026	Rater(s): J. Irvin	Date: 8/14/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [x] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

6	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [x] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

6	15
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [x] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [x] road bed/RR track
- [ ] dredging
- [ ] other ____________________

4	19
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [x] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

19

Site:	Hillsboro Solar - W026	Rater(s):	J. Irvin	Date:	8/14/23

19
subtotal previous page

Metric 5. Special Wetlands

0	19
max 10 pts.	subtotal

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

Metric 6. Plant Communities, Interspersion, Microtopography

5	24
max 20 pts.	subtotal

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [x] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [x] Nearly absent <5% cover (0)
- [ ] Absent (1)

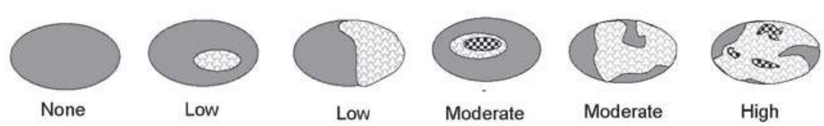
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

24	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W027	Rater(s): J. Irvin	Date: 8/14/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

1	3
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [x] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

10	13
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

3	16
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [x] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [x] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

16

Site:	Hillsboro Solar - W027	Rater(s):	J. Irvin	Date:	8/14/23

16
subtotal previous page

0	16
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

7	23
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [1] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [x] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [x] Nearly absent <5% cover (0)
- [ ] Absent (1)

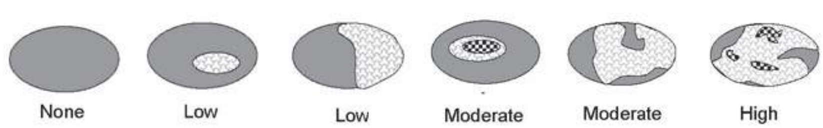
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [3] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

23

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W028	**Rater(s):** M. Inman, R. Riley	**Date:** 8/9/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	11
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

16	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☑ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☑ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☑ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ___________________

13	40
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☑ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☑ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

40

Site: Hillsboro Solar - W028	**Rater(s):** M. Inman, R. Riley	**Date:** 8/9/23

40
subtotal previous page

5	45
max 10 pts.	subtotal

Metric 5. Special Wetlands

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [x] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

9	54
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [x] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [x] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

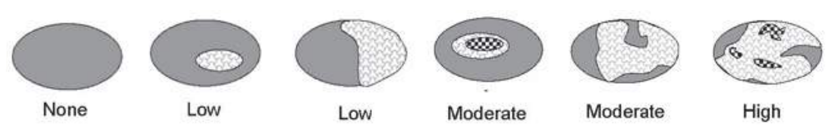
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [3] Coarse woody debris >15 cm (6 in.)
- [3] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

54 — **GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHOROITY RAPID ASSESSMENT MEHTOD: Assessing Wetland Condition, Functional Capacity, Quality

TVARAM FIELD FORM

Site: Hillsboro Solar - W029	**Rater(s):** M. Inman, R. Riley	**Date:** 8/8/23

4	4
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [x] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	12
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

15	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other farming

11	38
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [x] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

38

Site:	Hillsboro Solar - W029	Rater(s):	M. Inman, R. Riley	Date:	8/8/23

38
subtotal previous page

0 (max 10 pts.) | 38 (subtotal)

Metric 5. Special Wetlands

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

09 (max 20 pts.) | 47 (subtotal)

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

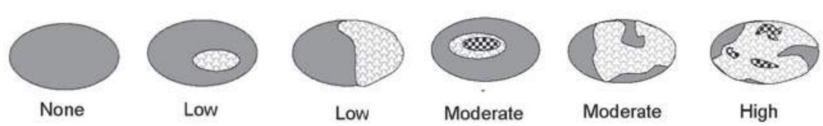
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [1] Coarse woody debris >15 cm (6 in.)
- [2] Standing dead >25 cm (10 in.) dbh
- [2] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

47

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

TENNESSEE VALLEY AUTHOROITY RAPID ASSESSMENT MEHTOD: Assessing Wetland Condition, Functional Capacity, Quality

TVARAM FIELD FORM

Site: Hillsboro Solar - W030	**Rater(s):** M. Inman, R. Riley	**Date:** 8/8/23

4	4
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [x] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	12
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

15	27
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other farming

11	38
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [x] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

38

Site:	Hillsboro Solar - W030	Rater(s):	M. Inman, R. Riley	Date:	8/8/23

38
subtotal previous page

0	38
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

09	47
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- 3 Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ✓ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ✓ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

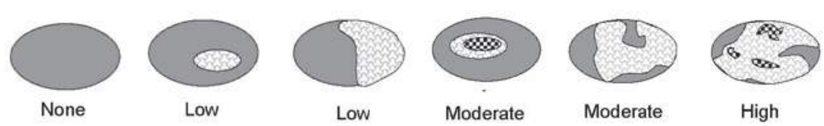
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- 1 Coarse woody debris >15 cm (6 in.)
- 2 Standing dead >25 cm (10 in.) dbh
- 2 Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

47

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W031	Rater(s): M. Inman, R. Riley	Date: 8/7/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	11
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

8	19
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☑ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☑ road bed/RR track
- ☐ dredging
- ☐ other ____________________

11	30
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☑ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☑ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

30

Site: Hillsboro Solar - W031	**Rater(s):** M. Inman, R. Riley	**Date:** 8/7/23

30
subtotal previous page

0	30
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8	38
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ____________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [✓] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

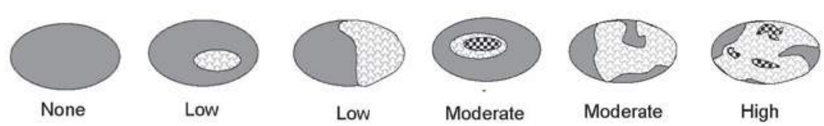
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [2] Standing dead >25 cm (10 in.) dbh
- [1] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

38	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W032	Rater(s): M. Inman, R. Riley	Date: 8/7/23

5	5
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [x] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8	13
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

13	26
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [x] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [x] road bed/RR track
- [ ] dredging
- [ ] other ____________________

14	40
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [x] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [x] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

40

Site: Hillsboro Solar - W032	Rater(s): M. Inman, R. Riley	Date: 8/7/23

40
subtotal previous page

0	40
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

010	50
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- ☐ Emergent
- ☐ Shrub
- 2 Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ✓ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ☐ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ✓ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

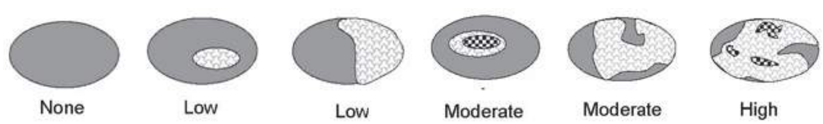
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- 2 Coarse woody debris >15 cm (6 in.)
- 2 Standing dead >25 cm (10 in.) dbh
- 2 Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

50

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: Hillsboro Solar - W033	Rater(s): M. Inman, R. Riley	Date: 8/7/23

2 (max 6 pts.)	2 (subtotal)

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

8 (max 14 pts.)	10 (subtotal)

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [x] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

12 (max 30 pts.)	22 (subtotal)

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [x] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [x] road bed/RR track
- [ ] dredging
- [ ] other ___________________

11 (max 20 pts.)	33 (subtotal)

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [x] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

33

Site: Hillsboro Solar - W033	**Rater(s):** M. Inman, R. Riley	**Date:** 8/7/23

33
subtotal previous page

0	33
max 10 pts.	subtotal

raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

8	41
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [3] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [x] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [x] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

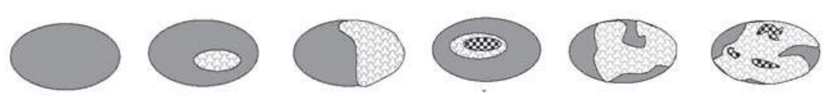
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [2] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

41	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

 W100

Site: UG Hillsboro - W034	Rater(s): L. Thiem	Date: 10/9/23

2 (max 6 pts.) | 2 (subtotal)

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

2 (max 14 pts.) | 4 (subtotal)

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [x] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

9 (max 30 pts.) | 13 (subtotal)

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [x] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [x] Seasonally inundated (2) [BR/CM (4)]
- [ ] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other ____________________

5 (max 20 pts.) | 18 (subtotal)

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [x] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [x] mowing
- [ ] grazing
- [ ] clearcutting
- [x] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

18

Site:	UG Hillsboro - W034	Rater(s):	L. Thiem	Date:	10/9/23

18
subtotal previous page

0	18
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- ☐ Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- ☐ Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- ☐ Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- ☐ Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- ☐ Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- ☐ Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- ☐ Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- ☐ Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- ☐ Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- ☐ Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- ☐ Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

3	21
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- ☐ Aquatic bed
- 1 Emergent
- ☐ Shrub
- ☐ Forest
- ☐ Mudflats
- ☐ Open water <20 acres (8 ha)
- ☐ Moss/lichen. Other ______________

Vegetation Community Cover Scale

- 0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
- 3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- ☐ High (5)
- ☐ Moderately high (4) [BR/CM (5)]
- ☐ Moderate (3)[BR/CM (5)]
- ☐ Moderately low (2) [BR/CM (3)]
- ✓ Low (1) [BR/CM (2)]
- ☐ None (0)

Narrative Description of Vegetation Quality

- low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
- mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
- high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ✓ Absent (1)

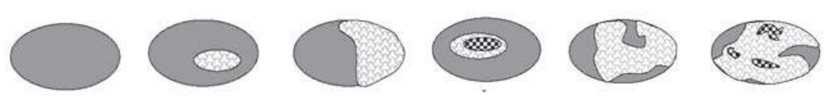
Mudflat and Open Water Class Quality

- 0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
- 1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
- 2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
- 3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- ☐ Vegetated hummocks/tussocks
- ☐ Coarse woody debris >15 cm (6 in.)
- ☐ Standing dead >25 cm (10 in.) dbh
- ☐ Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

- 0 = Absent
- 1 = Present in very small amounts or if more common of marginal quality
- 2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 = Present in moderate or greater amounts and of highest quality

21

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

 W101

Site:	UG Hillsboro - W035	Rater(s):	E. Lawton	Date:	10/10/23

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☐ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☑ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GIS data

8	9
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☑ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☑ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

6	15
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☐ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☐ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☐ Seasonally inundated (2) [BR/CM (4)]
- ☑ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☑ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ other ____________________

3	18
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☑ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☑ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☑ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

18

Site:	UG Hillsboro - W035	Rater(s):	E. Lawton	Date:	10/10/23

18
subtotal previous page

0	18
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

0	18
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ____________

Vegetation Community Cover Scale

0 =	Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 =	Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 =	Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 =	Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [x] None (0)

Narrative Description of Vegetation Quality

low =	Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod =	Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high =	A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [x] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

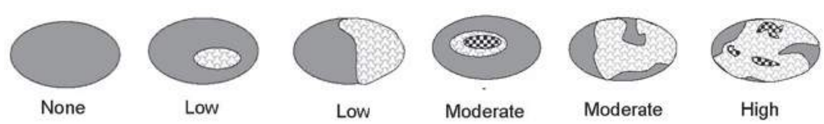
Mudflat and Open Water Class Quality

0 =	Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 =	Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 =	Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 =	High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 =	Absent
1 =	Present in very small amounts or if more common of marginal quality
2 =	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 =	Present in moderate or greater amounts and of highest quality

18

GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

 W102

Site: UG Hillsboro - W036	Rater(s): J. Velasquez	Date: 10/9/23

4 (max 6 pts.) | 4 (subtotal)

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [x] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [ ] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GIS data

7 (max 14 pts.) | 11 (subtotal)

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [x] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [ ] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [ ] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

16 (max 30 pts.) | 27 (subtotal)

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [x] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [x] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [x] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [x] other surrounded by agricultural field / in ROW

10 (max 20 pts.) | 37 (subtotal)

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [x] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [x] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed
- [x] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

37

Site:	UG Hillsboro - W036	Rater(s):	J. Velasquez	Date:	10/9/23

37
subtotal previous page

0	37
max 10 pts.	subtotal

raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6	43
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [1] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [x] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [x] Absent (1)

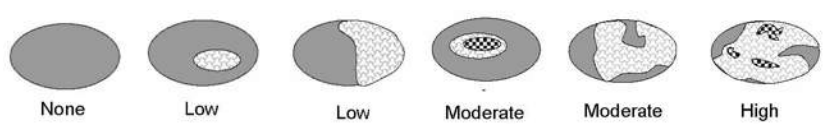
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [1] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

43	**GRAND TOTAL (max 100 pts)**

0- 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

 W103

Site: UG Hillsboro - W037	Rater(s): L. Thiem	Date: 10/9/23

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- [ ] >50 acres (>20.2 ha) (6 pts)
- [ ] 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- [ ] 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- [ ] 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- [x] 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- [ ] 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- [ ] <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

1	3
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- [ ] WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- [x] VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- [ ] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- [ ] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- [x] High. Urban, industrial, open pasture, row cropping, mining, construction (1)

5	8
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- [ ] High pH groundwater (5)
- [ ] Other groundwater (3) [BR/CM (5)]
- [x] Precipitation (1) [unless BR/CM primary source (5)]
- [ ] Seasonal/intermittent surface water (3)
- [ ] Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- [ ] 100-year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g., forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- [ ] >0.7 m (27.6 in.) (3)
- [ ] 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- [x] <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3) [BR/CM (4)]
- [ ] Seasonally inundated (2) [BR/CM (4)]
- [x] Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- [ ] None or none apparent (12)
- [ ] Recovered (7)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] ditch
- [ ] tile (including culvert)
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other tilling

3	11
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [ ] Recovering (2)
- [x] Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [x] Poor (1)

4c. Habitat alteration. Score one or double check and average.
- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [x] Recent or no recovery (1)

Check all disturbances observed
- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [x] farming
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] woody debris removal
- [ ] sedimentation
- [ ] dredging
- [ ] nutrient enrichment

11

Site: UG Hillsboro - W037	Rater(s): L. Thiem	Date: 10/9/23

11
subtotal previous page

0	11
max 10 pts.	subtotal

Metric 5. Special Wetlands

0
raw score*

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

0	11
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other ______________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [ ] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [✓] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

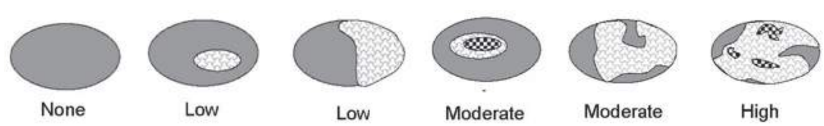
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [ ] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

11	**GRAND TOTAL (max 100 pts)**

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Site: UG Hillsboro - W038	Rater(s): L. Thiem & R. Riley	Date: 10/11/23

3	3
max 6 pts.	subtotal

Metric 1. Wetland Area (size)

Notes: BR/CM = adjusted points for Blue Ridge and Cumberland Mountains. If an open water body (excluding aquatic beds and seasonal mudflats) is >20 acres (8 ha), then add only 0.5 acre (0.2 ha) of it to the wetland size for Metric 1.

Select one size class and assign score.
- ☐ >50 acres (>20.2 ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2 ha) (5) [BR/CM (6)]
- ☐ 10 to <25 acres (4 to <10.1 ha) (4) [BR/CM (6)]
- ☑ 3 to <10 acres (1.2 to <4 ha) (3) [BR/CM (5)]
- ☐ 0.3 to <3 acres (0.1 to <1.2 ha) (2) [BR/CM (3)]
- ☐ 0.1 to <0.3 acre (0.04 to <0.1 ha) (1) [BR/CM (2)]
- ☐ <0.1 acre (0.04 ha) (0)

Sources/assumptions for size estimate (list):

GIS Data

4	7
max 14 pts.	subtotal

Metric 2. Upland Buffers and Surrounding Land Use

2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- ☐ WIDE. Buffers average 50 m (164 ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25 m to <50 m (82 to <164 ft) around wetland perimeter (4)
- ☑ NARROW. Buffers average 10 m to <25 m (32 ft to <82 ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10 m (<32 ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.
- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young 2nd growth forest (5)
- ☑ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field (3)
- ☐ High. Urban, industrial, open pasture, row cropping, mining, construction (1)

11	18
max 30 pts.	subtotal

Metric 3. Hydrology

3a. Sources of water. Score all that apply.
- ☐ High pH groundwater (5)
- ☑ Other groundwater (3) [BR/CM (5)]
- ☑ Precipitation (1) [unless BR/CM primary source (5)]
- ☐ Seasonal/intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.
- ☐ 100-year floodplain (1)
- ☑ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g., forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.
- ☐ >0.7 m (27.6 in.) (3)
- ☐ 0.4 to 0.7 m (16 to 27.6 in.) (2) [BR/CM (3)]
- ☑ <0.4 m (<16 in.) (1) [BR/CM 0.15 to 0.4 m (6 to <16 in.) (2)]

3d. Duration inundation/saturation. Score one or dbl. check & avg.
- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3) [BR/CM (4)]
- ☑ Seasonally inundated (2) [BR/CM (4)]
- ☐ Seasonally saturated in upper 30 cm (12 in.) (1) [BR/CM (2)]

3e. Modifications to natural hydrologic regime. Score one or double check and average.
- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ ditch
- ☐ tile (including culvert)
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☑ other beaver dam

8	26
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development

4a. Substrate disturbance. Score one or double check and average.
- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☑ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.
- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☑ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.
- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☑ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed
- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☑ farming
- ☐ toxic pollutants
- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ woody debris removal
- ☐ sedimentation
- ☐ dredging
- ☐ nutrient enrichment

26

Site:	UG Hillsboro - W038	Rater(s):	L. Thiem & R. Riley	Date:	10/11/23

26
subtotal previous page

0	26
max 10 pts.	subtotal

0
raw score*

Metric 5. Special Wetlands

*If the documented raw score for Metric 5 is 30 points or higher, the site is automatically considered a Category 3 wetland.

Select all that apply. Where multiple values apply in row, score row as single feature with highest point value. Provide documentation for each selection (photos, checklists, maps, resource specialist concurrence, data sources, references, etc).

- [ ] Bog, fen, wet prairie (10); acidophilic veg., mossy substrate >10 sq.m, sphagnum or other moss (5); muck, organic soil layer (3)
- [ ] Assoc. forest (wetl. &/or adj. upland) incl. >0.25 acre (0.1 ha); old growth (10); mature >18 in. (45 cm) dbh (5) [exclude pine plantation]
- [ ] Sensitive geologic feature such as spring/seep, sink, losing/underground stream, cave, waterfall, rock outcrop/cliff (5)
- [ ] Vernal pool (5); isolated, perched, or slope wetland (4); headwater wetland [1st order perennial or above] (3)
- [ ] Island wetland >0.1 acre (0.04 ha) in reservoir, river, or perennial water >6 ft (2 m) deep (5)
- [ ] Braided channel or floodplain/terrace depressions (floodplain pool, slough, oxbow, meander scar, etc.) (3)
- [ ] Gross morph. adapt. in >5 trees >10 in. (25 cm) dbh: buttress, multitrunk/stool, stilted, shallow roots/tip-up, or pneumatophores (3)
- [ ] Ecological community with global rank (NatureServe): G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier]
- [ ] Known occurrence state/federal threatened/endangered species (10); other rare species with global rank G1*(10), G2*(5), G3*(3) [*use higher rank where mixed rank or qualifier] [exclude records which are only "historic"]
- [ ] Superior/enhanced habitat/use: migratory songbird/waterfowl (5); in-reservoir buttonbush (4); other fish/wildlife management/designation (3)
- [ ] Cat. 1 (very low quality) : <1 acre (0.4 ha) AND EITHER >80% cover of invasives OR nonvegetated on mined/excavated land (-10)

6	32
max 20 pts.	subtotal

Metric 6. Plant Communities, Interspersion, Microtopography

6a. Wetland vegetation communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [ ] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water <20 acres (8 ha)
- [ ] Moss/lichen. Other _____________

Vegetation Community Cover Scale

0 = Absent or <0.1 ha (0.25 acre) contiguous acre [For BR/CM <0.04 ha (0.1 acre)]
1 = Present and either comprises a small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2 = Present and either comprises a significant part of wetland's vegetation and is of moderate quality, or comprises a small part and is of high quality
3 = Present and comprises a significant part or more of wetland's vegetation and is of high quality

6b. Horizontal (plan view) interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high (4) [BR/CM (5)]
- [✓] Moderate (3)[BR/CM (5)]
- [ ] Moderately low (2) [BR/CM (3)]
- [ ] Low (1) [BR/CM (2)]
- [ ] None (0)

Narrative Description of Vegetation Quality

low = Low species diversity &/or dominance of nonnative or disturbance tolerant native species
mod = Native species are dominant component of the vegetation, although nonnative &/or disturbance tolerant native species can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare, threatened or endangered species
high = A predominance of native species with nonnative sp &/or disturbance tolerant native sp absent or virtually absent, and high sp diversity and often but not always, the presence of rate, threatened, or endangered species

6c. Coverage of invasive plants.
Add or deduct points for coverage.

- [ ] Extensive >75% cover (-5)
- [ ] Moderate 25-75% cover (-3)
- [✓] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

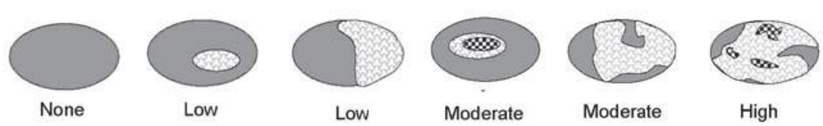
Mudflat and Open Water Class Quality

0 = Absent <0.1 ha (0.25 acres) [For BR/CM <0.04 ha (0.1 acre)]
1 = Low 0.1 to <1 ha (0.25 to 2.5 acres) [BR/CM 0.04 to <0.2 ha (0.1 to 0.5 acre)]
2 = Moderate 1 to <4 ha (2.5 to 9.9 acres) [BR/CM 0.2 to <02 ha (0.5 to 5 acre)]
3 = High 4 ha (9.9 acres) or more [BR/CM 2 ha (5 acres) or more]

6d. Microtopography.
Score all present using 0 to 3 scale.

- [ ] Vegetated hummocks/tussocks
- [2] Coarse woody debris >15 cm (6 in.)
- [ ] Standing dead >25 cm (10 in.) dbh
- [ ] Amphibian breeding pools

Hypothetical Wetland for Estimating Degree of Interspersion



Microtopography Cover Scale

0 = Absent
1 = Present in very small amounts or if more common of marginal quality
2 = Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3 = Present in moderate or greater amounts and of highest quality

32	GRAND TOTAL (max 100 pts)

0 29 = Category 1, low wetland function, condition, quality**
30- 59 = Category 2, good/moderate wetland function, condition, quality**
60-100 = Category 3, superior wetland function, condition, quality**

**Based on ORAM Score Calibration Report for the scoring breakpoints between wetland categories: http://www.epa.state.oh.us/dsw/401/401.html

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S001	Date/Time: 8/11/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.676795
Previous Rainfall (7-days) : 2.13"	Longitude: -87.264129
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : De, Decatur silty clay, 6 to 10 percent slopes, severely eroded	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	✔	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 22.50

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 11.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 6.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	2
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 5.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 22.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank height = 1'

Bank width = 3-4'

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S002	Date/Time: 8/11/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.676944
Previous Rainfall (7-days) : 2.13"	Longitude: -87.263961
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Lb, Lindside silty clay loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	☑	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☑	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☑	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 19.00

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 9.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 5.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	1
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 5.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank height = 1'

Bank width = 3-4'

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S003	Date/Time: 8/11/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.677331
Previous Rainfall (7-days) : 2.13"	Longitude: -87.262667
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Lindside silty clay loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 30.00

Justification / Notes :

Presence of naturally occurring ground water table connection.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14.50	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	1
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 8.50	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 7.00	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	3
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	1
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 30.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank height = 1'

Bank width = 4-6'

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S004	Date/Time: 8/11/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.677289
Previous Rainfall (7-days) : 2.13"	Longitude: -87.261201
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Ooltewah silt loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 30.00

Justification / Notes :

Presence of naturally occurring ground water table connection.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14.50	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	1
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 8.50	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 7.00	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	3
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	1
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 30.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank height = 1'

Bank width = 4-6'

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S005	Date/Time: 8/11/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.677163
Previous Rainfall (7-days) : 2.13"	Longitude: -87.26135
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Ooltewah silt loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 27.50

Justification / Notes :

Secondary indicator score is more than 19 points.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 13.50	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	1
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	1
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 6.50	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	2
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 7.50	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	3
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0.5
25. Macrobenthos (record type & abundance)	0	1	2	3	1
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 27.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank height = 1'

Bank width = 4-6'

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S006	Date/Time: 8/10/23
Assessors/Affiliation: HDR, Inc.; P. Bright	Project ID :
Site Name/Description: Hillsboro, Urban Grid Solar	
Site Location: Decatur, AL	
HUC (12 digit): 060300021201: Red Branch-Spring Creek	Latitude: 34.673933
Previous Rainfall (7-days) : 2.13"	Longitude: 87.253610
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE Antecedent Precipitation Tool	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Lb- Lindside silty clay loam	Source: WSS
Surrounding Land Use : agriculture, residential	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 36.00

Justification / Notes :

Spring Creek.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 18.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	1
6. Depositional bars or benches	0	1	2	3	2
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	1
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	3

B. Hydrology (Subtotal = 10.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3	3
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 7.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	1
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	1
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 36.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Spring Creek.

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S007	Date/Time: 8-10-2023
Assessors/Affiliation: Paul Bright/HDR Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.674177
Previous Rainfall (7-days) : 2.13"	Longitude: -87.277760
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence County
Soil Type(s) / Geology : Ob, Ooltewah silt loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	☑	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☑	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☑	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 19.00

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	1
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 8.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 3.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	1
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank height = 1-2'

Bank width = 2-3'

Top of bank = 4-5'

Multiple rain events within 72.

Carya ovata observed growing in channel.

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S008	Date/Time: 8/10/23
Assessors/Affiliation: HDR, Inc.; M. Inman, R. Riley	Project ID :
Site Name/Description: Hillsboro, Urban Grid Solar	
Site Location: Decatur, AL	
HUC (12 digit): 060300021201: Red Branch-Spring Creek	Latitude: 34.675842
Previous Rainfall (7-days) : 2.13"	Longitude: 87.241807
Precipitation this Season vs. Normal : average	Source of recent & seasonal precip. data : USACE Antecedent Precipitation Tool
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Lb- Lindside silty clay loam	Source: WSS
Surrounding Land Use : agriculture, residential	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 43.50

Justification / Notes :

Perennial stream

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 21.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	1
6. Depositional bars or benches	0	1	2	3	2
7. Braided channel	0	1	2	3	1
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	1
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	3

B. Hydrology (Subtotal = 10.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3	3
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 12.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	2
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	1
25. Macrobenthos (record type & abundance)	0	1	2	3	3
26. Filamentous algae; periphyton	0	1	2	3	1
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 43.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S009	Date/Time: 8/10/23
Assessors/Affiliation: HDR, Inc.; M. Inman, R. Riley	Project ID :
Site Name/Description: Hillsboro	
Site Location: Decatur, AL	
HUC (12 digit): 060300021201: Red Branch-Spring Creek	Latitude: 34.684486
Previous Rainfall (7-days) : 2.13"	Longitude: 87.239647
Precipitation this Season vs. Normal : average	Source of recent & seasonal precip. data : USACE Antecedent Precipitation Tool
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Dc- Decatur silt clay loam	Source: WSS
Surrounding Land Use : agriculture, residential	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 35.00

Justification / Notes :

Perennial stream; connected to Spring Creek, Wheeler Branch

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 12.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	2.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	1
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. **Hydrology** (Subtotal = 10.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3	3
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. **Biology** (Subtotal = 12.50	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	3
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	2
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0.5
25. Macrobenthos (record type & abundance)	0	1	2	3	3
26. Filamentous algae; periphyton	0	1	2	3	1
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 35.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S010	Date/Time: 8/10/23
Assessors/Affiliation: HDR, Inc.; M. Inman, R. Riley	Project ID :
Site Name/Description: Hillsboro, Urban Grid Solar	
Site Location: Decatur, AL	
HUC (12 digit): 060300021201: Red Branch-Spring Creek	Latitude: 34.683989
Previous Rainfall (7-days) : 2.13"	Longitude: 87.240622
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE Antecedent Precipitation Tool	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Ma- Melvin silt loam	Source: WSS
Surrounding Land Use : agriculture, residential	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1” in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = “Yes”, then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 25.00

Justification / Notes :

Intermittent stream

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 10.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	1
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 7.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	1
15. Water in channel and >48 hours since sig. rain	0	1	2	3	2
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 7.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	1
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	1
25. Macrobenthos (record type & abundance)	0	1	2	3	1
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 25.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Crayfish and snails found within the stream.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S011	Date/Time: 8/11/23
Assessors/Affiliation: HDR, Inc.; M. Inman, R. Riley	Project ID :
Site Name/Description: Hillsboro, Urban Grid Solar	
Site Location: Decatur, AL	
HUC (12 digit): 060300021201: Red Branch-Spring Creek	Latitude: 34.670290
Previous Rainfall (7-days) : 2.13"	Longitude: -87.242739
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE Antecedent Precipitation Tool	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Ma- Melvin silt loam	Source: WSS
Surrounding Land Use : agriculture, residential	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 30.00

Justification / Notes :

Secondary indicator score is more than 19 points.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 14.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	2
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	1.5
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	1
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 8.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 8.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	3
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	1
25. Macrobenthos (record type & abundance)	0	1	2	3	1
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 30.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

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312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: S012	Date/Time: 10/10/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.771758
Previous Rainfall (7-days) : 1.37"	Longitude: -87.365626
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Prader silt loam	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 19.00

Justification / Notes :

Intermittent stream

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 12.00	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	2
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 3.00	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 4.00	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	2
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 19.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

BW 5-6', OHWM 1', WD 0, substrate: small cobble, gravel, silt

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E001	Date/Time: 8/7/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.673451
Previous Rainfall (7-days) : 2.13"	Longitude: -87.277330
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Etowah loam, eroded, undulating phase	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	☑	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☐	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☑	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 2.50

Justification / Notes :

Defined bed and bank absent. Secondary indicator score is less than 19 points.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 1.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	0
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0.5
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	0
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 2.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

No channel observed.

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E002	Date/Time: 8/7/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.666822
Previous Rainfall (7-days) : 2.13"	Longitude: -87.279768
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Cumberland loam, 2 to 6 percent slopes, eroded	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Severe	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	☑	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☑	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☑	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☑	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 6.00

Justification / Notes :

Defined bed and bank absent due to recent clearing. Secondary indicator score is less than 19 points.

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 4.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0.5
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	1
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	0
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. **Hydrology** (Subtotal = 2.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	0
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. **Biology** (Subtotal = 0.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 6.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

No channel observed.

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E003	Date/Time: 8/7/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.677166
Previous Rainfall (7-days) : 2.13"	Longitude: -87.262245
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Ooltewah silt loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Severe	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	✔	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 13.50

Justification / Notes :

E003 is classified as an ephemeral channel with a direct connection to S003 (perennial).

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.00

	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 5.00

	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	1
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 1.50

	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0.5
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 13.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank width: 3-4'

Bank height: <1'

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E004	Date/Time: 8/10/23
Assessors/Affiliation: Paul Bright/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.670510
Previous Rainfall (7-days) : 2.13"	Longitude: -87.257652
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Cv, Cumberland loam, 2 to 6 percent slopes, eroded	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	✔	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 11.50

Justification / Notes :

Secondary indicator score is less than 19 points.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 3.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	1
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 1.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	1
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank height = 1-2'

Bank width = 1-2'

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E005	Date/Time: 8/10/23
Assessors/Affiliation: Paul Bright/HDR Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.670550
Previous Rainfall (7-days) : 2.13"	Longitude: -87.253428
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence County
Soil Type(s) / Geology : Cv, Cumberland loam, 2 to 6 percent slopes, eroded	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	✔	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 8.00

Justification / Notes :

Secondary indicator score is less than 19 points.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0.5
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	0
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 2.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 3.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	1
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Bank width = 6-8'

Bank height = 1'

Multiple rain events within past 72 hours.

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E006	Date/Time: 8/10/23
Assessors/Affiliation: Michael Inman/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.683382
Previous Rainfall (7-days) : 2.13"	Longitude: -87.240952
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Melvin silt loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	✔	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 17.50

Justification / Notes :

E006 is classified as an ephemeral channel with a direct connection to Wheeler Branch. Secondary indicator score is less than 19 points.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	1
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0.5
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 5.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	1
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. Biology (Subtotal = 5.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 17.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E007	Date/Time: 8/10/23
Assessors/Affiliation: Michael Inman/HDR, Inc.	Project ID :
Site Name/Description: Hillsboro Solar	
Site Location: Courtland, Alabama	
HUC (12 digit): 060300021201	Latitude: 34.683254
Previous Rainfall (7-days) : 2.13"	Longitude: -87.240927
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Melvin silt loam	Source: NRCS
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	**NO**	**YES**
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	✔	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	☐	Stream
6. Presence of fish (except *Gambusia*)	☐	Stream
7. Presence of naturally occurring ground water table connection	☐	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	☐	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 15.50

Justification / Notes :

E007 is classified as an ephemeral channel with a direct connection to Wheeler Branch. Secondary indicator score is less than 19 points.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0.5
10. Headcuts	0	1	2	3	0.5
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 4.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	2
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	1
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 3.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	2
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 15.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E008	Date/Time: 8/10/23
Assessors/Affiliation: HDR, Inc.; M. Inman, R. Riley	Project ID :
Site Name/Description: Hillsboro, Urban Grid Solar	
Site Location: Decatur, AL	
HUC (12 digit): 060300021201: Red Branch-Spring Creek	Latitude: 34.683086
Previous Rainfall (7-days) : 2.13"	Longitude: 87.240061
Precipitation this Season vs. Normal : average	Source of recent & seasonal precip. data : USACE Antecedent Precipitation Tool
Watershed Size : Approximately 19.37 square miles	County: Lawrence
Soil Type(s) / Geology : Ma- Melvin silt loam	Source: WSS
Surrounding Land Use : agriculture, residential	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 18.00

Justification / Notes :

Ephemeral stream

Secondary Field Indicator Evaluation

A. **Geomorphology** (Subtotal = 5.50	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. **Hydrology** (Subtotal = 6.00	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	2
15. Water in channel and >48 hours since sig. rain	0	1	2	3	1
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

C. **Biology** (Subtotal = 6.50	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	1
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0.5
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	1
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 18.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E009	Date/Time: 10/9/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.791830
Previous Rainfall (7-days) : 1.37"	Longitude: -87.380940
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Baxter cherty silt loam, hilly phase	Source: USDA Web Soil Survey
Surrounding Land Use : Forest	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☐	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 5.00

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 4.50	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.50	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 5.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Drainage feature, BW 1', BH 6", WD 0, substrate: silt/soil

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E010	Date/Time: 10/9/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.781643
Previous Rainfall (7-days) : 1.37"	Longitude: -87.375336
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Etowah silt loam, 2 to 6 percent slopes, eroded	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	**NO**	**YES**
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☐	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 3.00

Justification / Notes :

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 3.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Ditch, BW 1-2', BH 0-4", WD 0, substrate: silt/soil

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E011	Date/Time: 10/10/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.774519
Previous Rainfall (7-days) : 1.37"	Longitude: -87.368297
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Prader silt loam	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 8.50

Justification / Notes :

Erosional gully in a cotton field

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.50

	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0.5
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	2
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.00

	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00

	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

BW 1-4', OHWM 1', WD 0, substrate: silt/cobble

Cobble appears to have been brought in as erosion control

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E012	Date/Time: 10/10/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.770166
Previous Rainfall (7-days) : 1.37"	Longitude: -87.364268
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Abernathy-Emory fine sandy loams, 0 to 2 percent slopes	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 7.00

Justification / Notes :

Mapped as Goode Branch

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 1.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0.5
21. Rooted plants in the thalweg [1]	3	2	1	0	0.5
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 7.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

BW 1', OHWM 0-6", WD 0, substrate: silt/gravel

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E013	Date/Time: 10/10/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.759978
Previous Rainfall (7-days) : 1.37"	Longitude: -87.354012
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Abernathy-Emory fine sandy loams, 0 to 2 percent slopes	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	**NO**	**YES**
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☐	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 5.50

Justification / Notes :

Non-jurisdictional erosional gully

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	2
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 5.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Erosional gully, BW 1', OHWM 1', WD 0, substrate: silt/soil

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E014	Date/Time: 10/10/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.755288
Previous Rainfall (7-days) : 1.37"	Longitude: -87.349377
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Abernathy-Emory fine sandy loams, 0 to 2 percent slopes	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	☐	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 5.50

Justification / Notes :

Non-jurisdictional erosional gully in a soybean field

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 5.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	2
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 5.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Erosional gully, BW 1', OHWM 1', WD 0, substrate: silt/soil

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E015	Date/Time: 10/10/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.749331
Previous Rainfall (7-days) : 1.37"	Longitude: -87.343031
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Abernathy-Emory silt loams, 0 to 2 percent slopes	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	☐	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 8.50

Justification / Notes :

Ditch between soybean fields

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.50	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0.5
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	2
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.00	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

BW 2-3', OHWM 1', WD 0, substrate: silt/soil

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E016	Date/Time: 10/10/23
Assessors/Affiliation: L. Thiem & E. Lawton	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.742859
Previous Rainfall (7-days) : 1.37"	Longitude: -87.336384
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Decatur silt clay, 6 to 12 percent slopes	Source: USDA Web Soil Survey
Surrounding Land Use : Agriculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = ** WET WEATHER CONVEYANCE

**Secondary Indicator Score (if applicable) = ** 11.50

Justification / Notes :

Mapped as a blue line perennial stream

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 7.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	0.5
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	1
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 3.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	2
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 11.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

BW 2', OHWM 6-12", WD 0, substrate silt/gravel

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E017	Date/Time: 10/10/23
Assessors/Affiliation: HDR, Inc.; J. Velasquez, E. Lawton	Project ID : WWC002E
Site Name/Description: Hillsboro	
Site Location: Hillsboro, AL	
HUC (12 digit): Lower Big Nance Creek (060300050105)	Latitude: 34.726701
Previous Rainfall (7-days) :	Longitude: -87.320019
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : 152 ft	County: Morgan
Soil Type(s) / Geology : Emory-Abernathy silt loams, 0 to 6 percent slopes	Source: WSS
Surrounding Land Use : Argiculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 8.50

Justification / Notes :

Width 2 ft

Running through an agriculture field as a result of flooding.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	0.5
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 4.50	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	1.5
21. Rooted plants in the thalweg [1]	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E018	Date/Time: 10/10/23
Assessors/Affiliation: HDR, Inc.; J. Velasquez, E. Lawton	Project ID : WWC102E
Site Name/Description: Hillsboro	
Site Location: Hillsboro, AL	
HUC (12 digit): Lower Big Nance Creek (060300050105)	Latitude: 34.669430
Previous Rainfall (7-days) :	Longitude: 87.288663
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : 65ft	County: Morgan
Soil Type(s) / Geology : Ooltewah silt loam	Source: WSS
Surrounding Land Use : Argiculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1” in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = “Yes”, then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 5.50

Justification / Notes :

Width 2 ft

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.00

	Absent	Weak	Moderate	Strong	
1. Continuous bed and bank	0	1	2	3	0.5
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.50

	Absent	Weak	Moderate	Strong	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 2.00

	Absent	Weak	Moderate	Strong	
20. Fibrous roots in channel bed [1]	3	2	1	0	1
21. Rooted plants in the thalweg [1]	3	2	1	0	1
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 5.50

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E019	Date/Time: 10/10/23
Assessors/Affiliation: HDR, Inc.; J. Velasquez, E. Lawton	Project ID : WWC001E
Site Name/Description: Hillsboro	
Site Location: Hillsboro, AL	
HUC (12 digit): Lower Big Nance Creek (060300050105)	Latitude: 34.668518
Previous Rainfall (7-days) :	Longitude: -87.284965
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : 222 ft	County: Morgan
Soil Type(s) / Geology : Emory-Abernathy silt loams, 0 to 6 percent slopes	Source: WSS
Surrounding Land Use : Argiculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 7.00

Justification / Notes :

Width 2 ft

Running through an agriculture field as a result of flooding.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 2.50	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	0.5
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	NA
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 4.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	2
21. Rooted plants in the thalweg [1]	3	2	1	0	2
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 7.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Tennessee Department of Environment and Conservation - Division of Water Resources
312 Rosa L. Parks Ave. 11th Floor. Nashville, TN 37243

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E020	Date/Time: 10/10/23
Assessors/Affiliation: HDR, Inc.; J. Velasquez, E. Lawton	Project ID : WWC003E
Site Name/Description: Hillsboro	
Site Location: Hillsboro, AL	
HUC (12 digit): Lower Big Nance Creek (060300050105)	Latitude: 34.667469
Previous Rainfall (7-days) :	Longitude: 87.238011
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data :	
Watershed Size : 280 ft	County: Morgan
Soil Type(s) / Geology : Emory-Abernathy silt loams, 0 to 2 percent slopes	Source: WSS
Surrounding Land Use : Argiculture	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Moderate	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	✔	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1” in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = “Yes”, then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 8.00

Justification / Notes :

Width 4 ft

Running through an agriculture field as a result of flooding.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 3.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	1
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0.5
12. Natural valley or drainageway	0	0.5	1	1.5	0.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 1.50	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 3.50	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	1.5
21. Rooted plants in the thalweg [1]	3	2	1	0	2
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

[1] Focus is on the presence of terrestrial plants. [2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Tennessee Department of Environment and Conservation - Division of Water Resources
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Hydrologic Determination Field Data Sheet

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: E021	Date/Time: 10/11/23
Assessors/Affiliation: L. Thiem & R. Riley	Project ID :
Site Name/Description:	
Site Location: Courtland, Alabama	
HUC (12 digit): Lower Big Nance Creek 060300050105	Latitude: 34.677143
Previous Rainfall (7-days) : 1.37"	Longitude: 87.231232
Precipitation this Season vs. Normal : average Source of recent & seasonal precip. data : USACE APT, CoCoRaHs	
Watershed Size :	County: Lawrence
Soil Type(s) / Geology : Decatur silty clay, 6 to 10 percent slopes, severely eroded	Source: USDA Web Soil Survey
Surrounding Land Use :	
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	✔	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	✔	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions N/A	☐	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	☐	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	✔	Stream
6. Presence of fish (except *Gambusia*)	✔	Stream
7. Presence of naturally occurring ground water table connection	✔	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	✔	Stream
9. Evidence watercourse has been used as a supply of drinking water	✔	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WET WEATHER CONVEYANCE

Secondary Indicator Score (if applicable) = 8.00

Justification / Notes :

Erosional gully

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 8.00	**Absent**	**Weak**	**Moderate**	**Strong**	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	2
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

B. Hydrology (Subtotal = 0.00	**Absent**	**Weak**	**Moderate**	**Strong**	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	0
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

C. Biology (Subtotal = 0.00	**Absent**	**Weak**	**Moderate**	**Strong**	
20. Fibrous roots in channel bed [1]	3	2	1	0	0
21. Rooted plants in the thalweg [1]	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macrobenthos (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed [2]	0	0.5	1	1.5	0

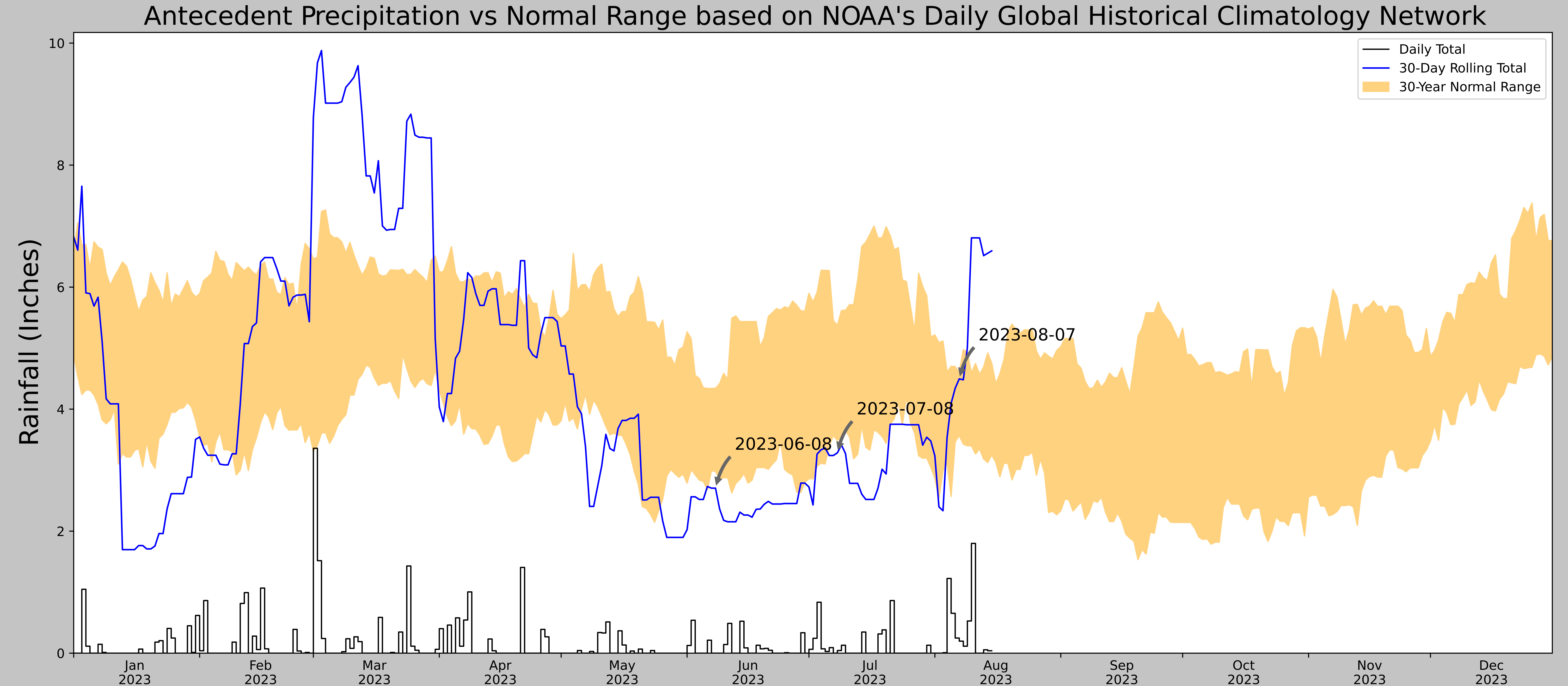
[1] Focus is on the presence of terrestrial plants.
[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 8.00

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

BW 1', OHWM 1', WD 0, substrate: soil/silt



Coordinates	34.671075, -87.248684
Observation Date	2023-08-07
Elevation (ft)	572.114
Drought Index (PDSI)	Incipient drought (2023-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-07	3.566536	4.602362	4.496063	Normal	2	3	6
2023-07-08	3.486221	5.374803	3.283465	Dry	1	2	2
2023-06-08	2.980315	4.342126	2.704724	Dry	1	1	1
Result							Drier than Normal - 9

Figure and tables made by the
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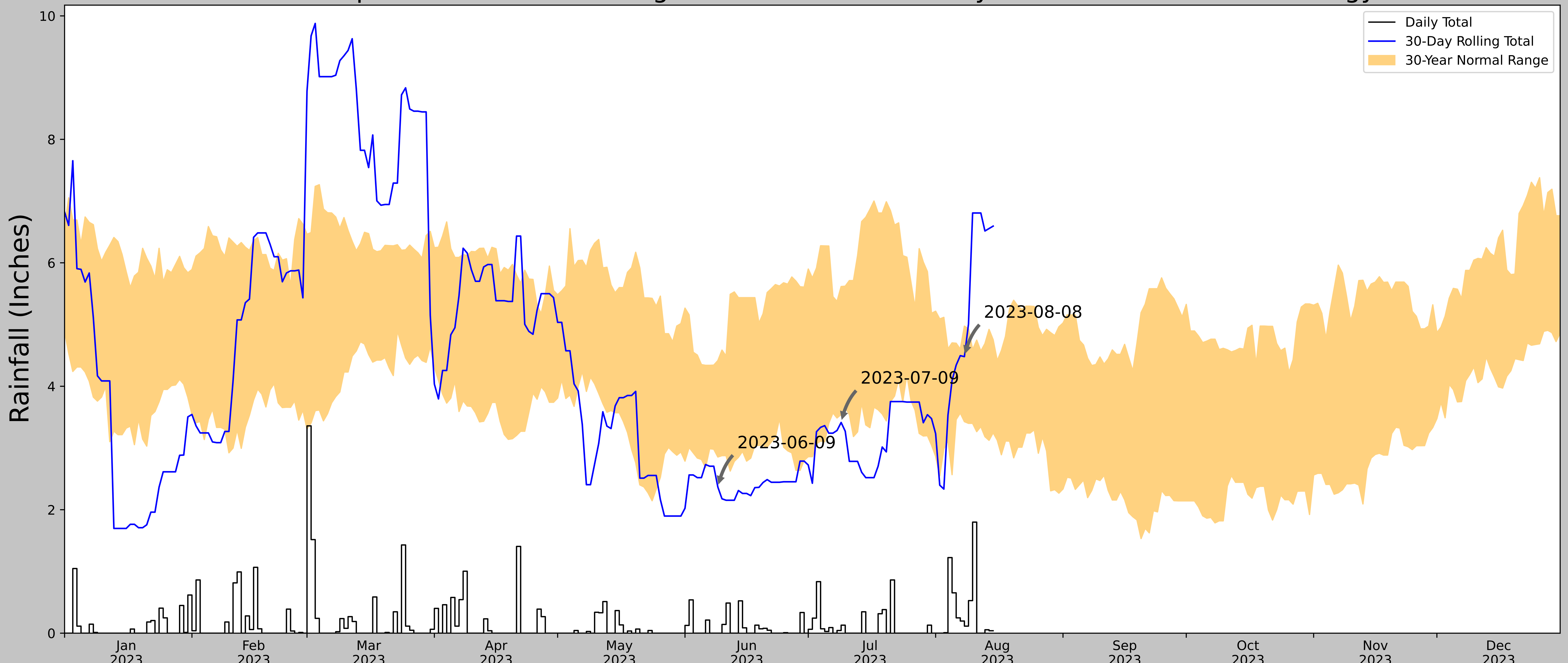
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	5.586	3.017	2.53	5956	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	5266	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	34.671075, -87.248684
Observation Date	2023-08-08
Elevation (ft)	572.114
Drought Index (PDSI)	Incipient drought (2023-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-08	3.427165	4.97441	4.480315	Normal	2	3	6
2023-07-09	3.542913	5.615748	3.413386	Dry	1	2	2
2023-06-09	2.853937	4.416536	2.366142	Dry	1	1	1
Result							Drier than Normal - 9

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	5.586	3.017	2.531	5956	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	5266	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

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Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Coordinates	34.671075, -87.248684
Observation Date	2023-08-09
Elevation (ft)	572.114
Drought Index (PDSI)	Incipient drought (2023-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-09	3.399213	4.929528	5.007874	Wet	3	3	9
2023-07-10	3.65748	5.62126	3.271654	Dry	1	2	2
2023-06-10	2.875984	4.586221	2.177165	Dry	1	1	1
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	5.586	3.017	2.531	5956	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	5266	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

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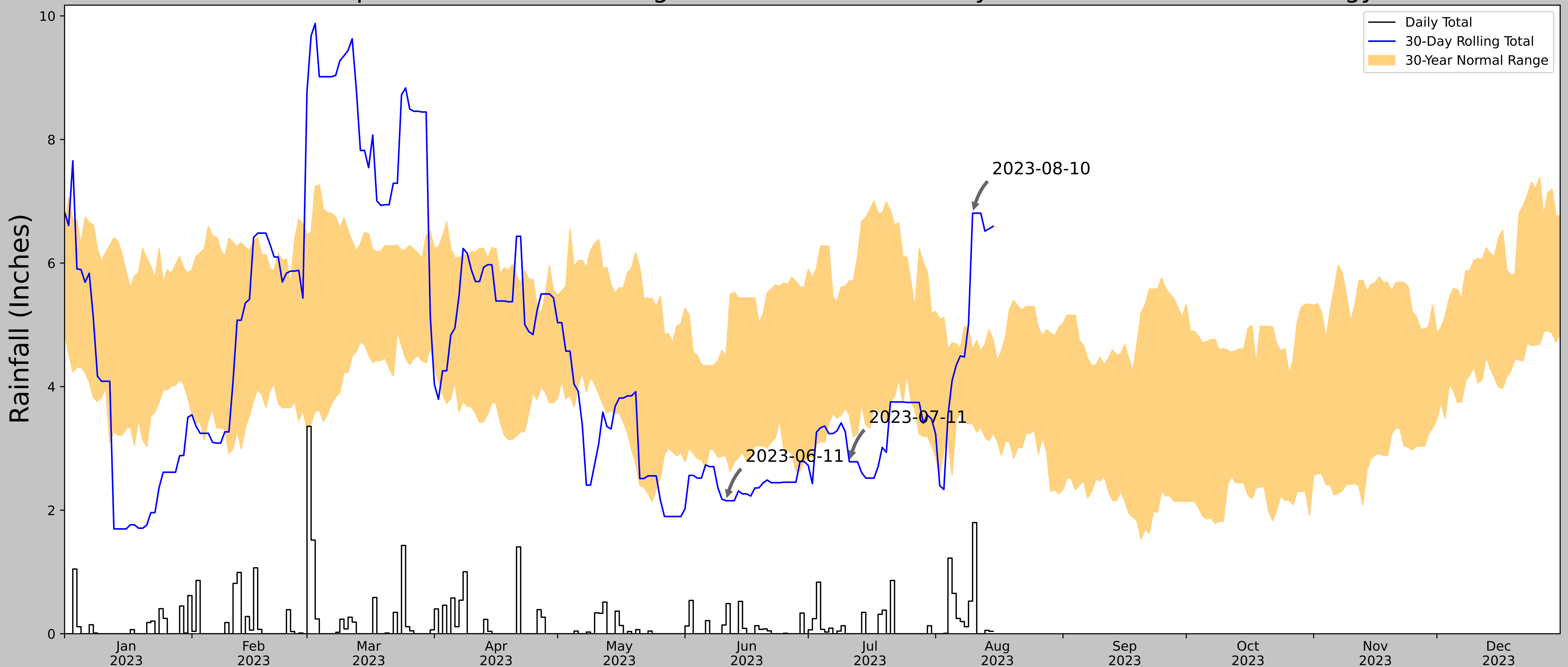

Coordinates	34.671075, -87.248684
Observation Date	2023-08-10
Elevation (ft)	572.114
Drought Index (PDSI)	Incipient drought (2023-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-10	3.399213	4.594095	6.807087	Wet	3	3	9
2023-07-11	3.541732	5.712205	2.783465	Dry	1	2	2
2023-06-11	2.875984	4.489764	2.153543	Dry	1	1	1
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	5.586	3.017	2.531	5956	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	5266	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

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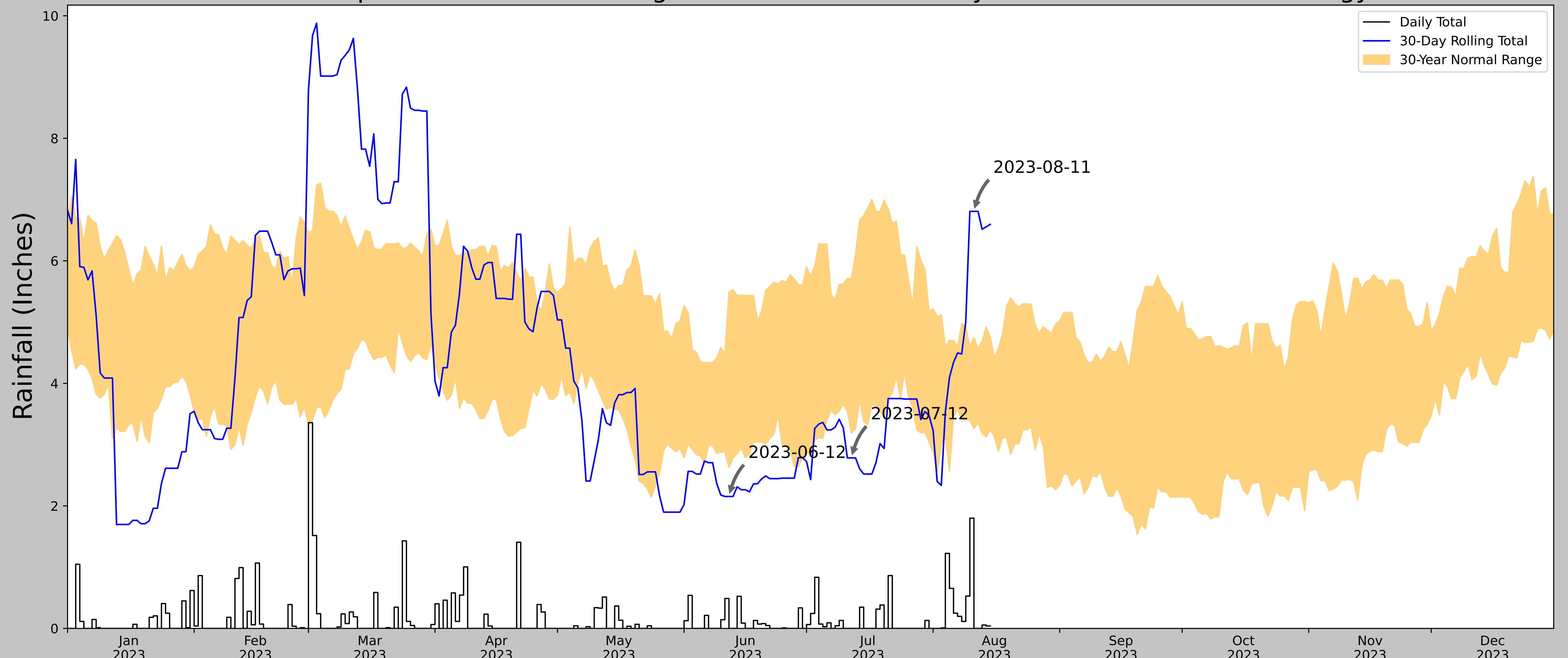

Coordinates	34.671075, -87.248684
Observation Date	2023-08-11
Elevation (ft)	572.114
Drought Index (PDSI)	Incipient drought (2023-07)
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-08-11	3.264567	4.747638	6.807087	Wet	3	3	9
2023-07-12	3.185827	5.712205	2.783465	Dry	1	2	2
2023-06-12	2.625984	5.489764	2.153543	Dry	1	1	1
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	5.586	3.017	2.531	5956	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	5266	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

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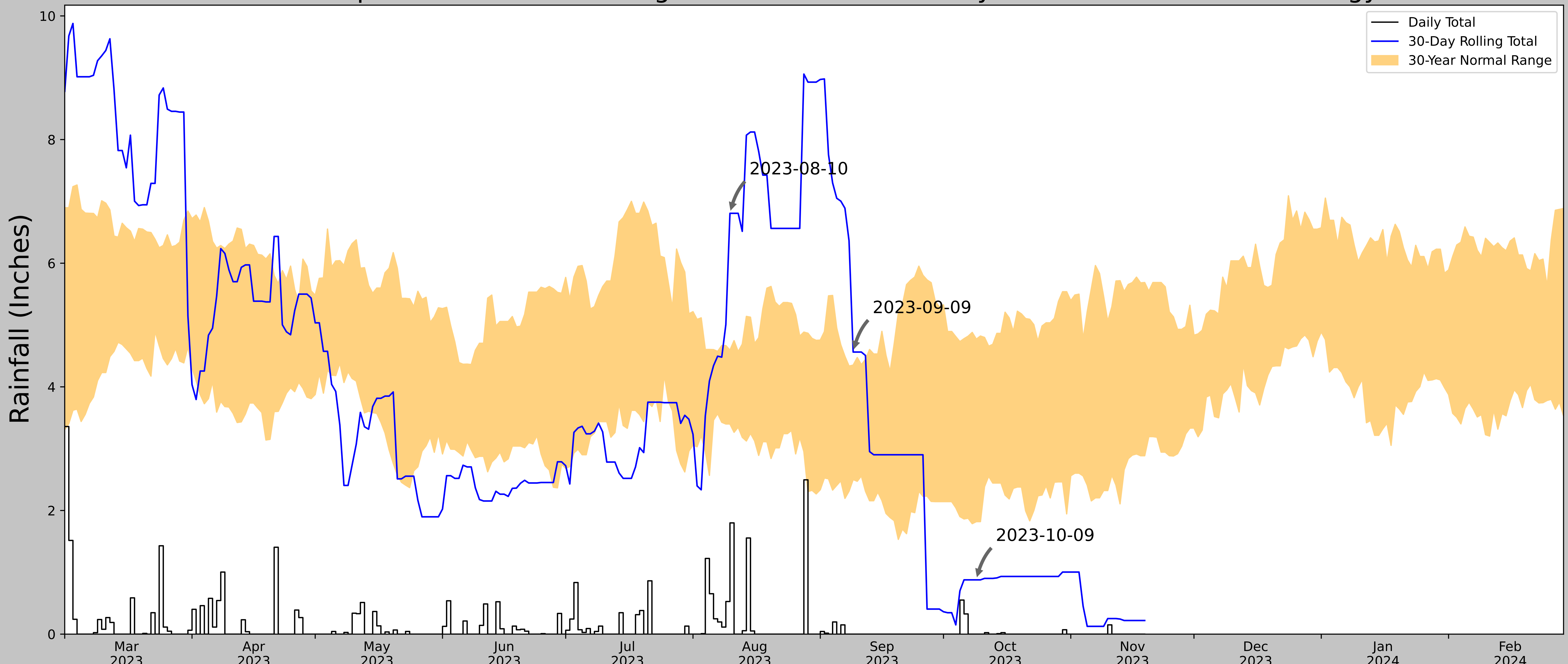

Coordinates	34.723183, -87.316593
Observation Date	2023-10-09
Elevation (ft)	593.37
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-09	1.819685	4.772047	0.877953	Dry	1	3	3
2023-09-09	2.5	4.351575	4.562992	Wet	3	2	6
2023-08-10	3.399213	4.594095	6.807087	Wet	3	1	3
Result							Normal Conditions - 12

Figure and tables made by the
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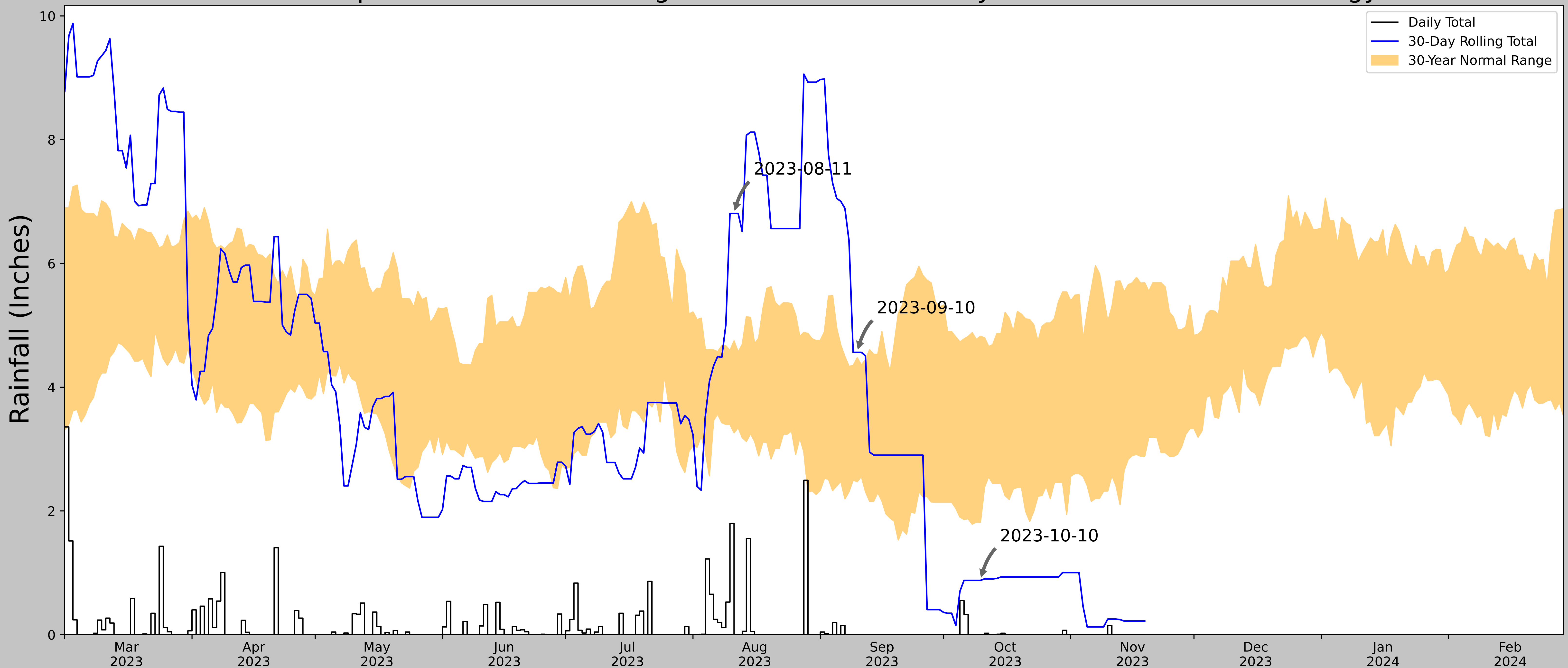
Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	4.657	18.239	2.181	6320	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	4901	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	34.723183, -87.316593
Observation Date	2023-10-10
Elevation (ft)	593.37
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-10	1.819685	4.822441	0.877953	Dry	1	3	3
2023-09-10	2.472441	4.474803	4.562992	Wet	3	2	6
2023-08-11	3.264567	4.747638	6.807087	Wet	3	1	3
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	4.657	18.239	2.181	6320	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	4901	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

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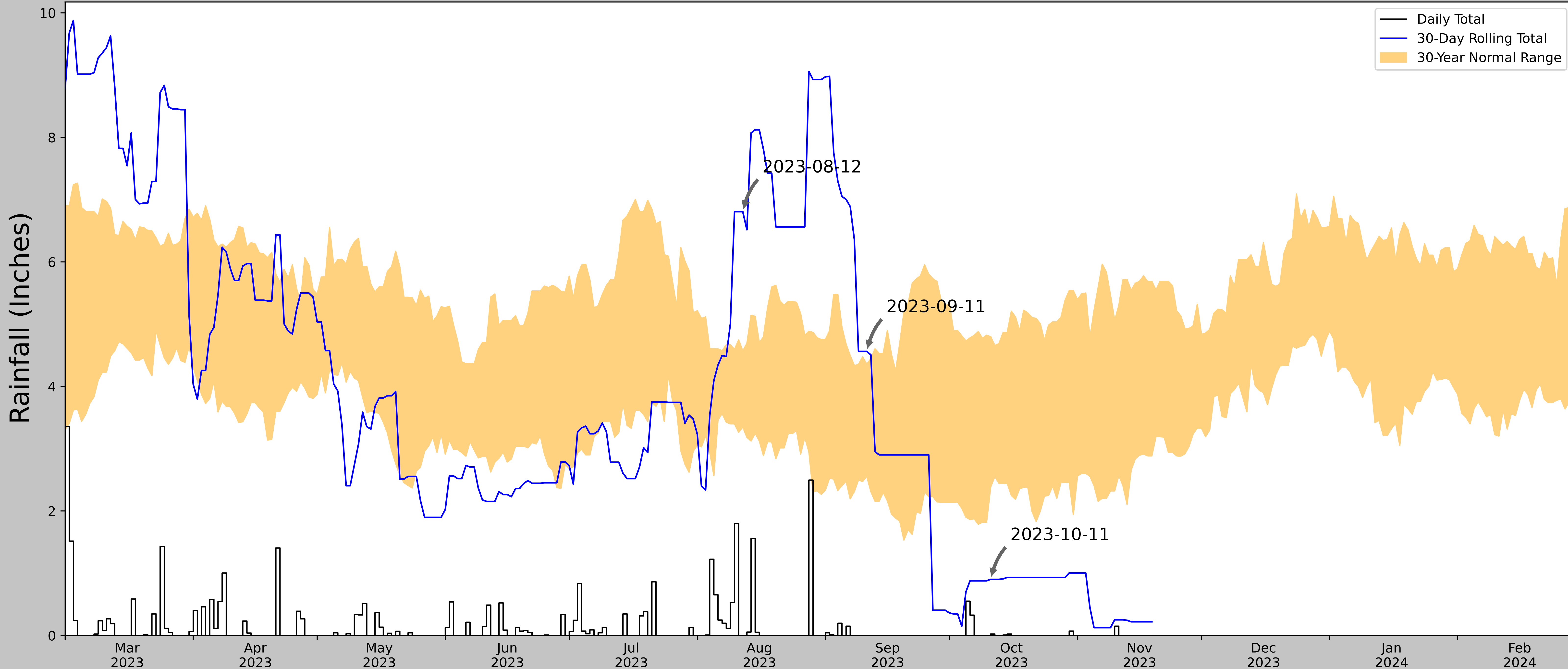

Coordinates	34.723183, -87.316593
Observation Date	2023-10-11
Elevation (ft)	593.37
Drought Index (PDSI)	Mild drought
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-11	2.386221	4.799213	0.901575	Dry	1	3	3
2023-09-11	2.558661	4.358662	4.562992	Wet	3	2	6
2023-08-12	3.347244	4.569685	6.807087	Wet	3	1	3
Result							Normal Conditions - 12

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Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
COURTLAND 2 WSW	34.6603, -87.3461	575.131	4.657	18.239	2.181	6320	89
MUSCLE SHOALS 9.7 NNE	34.7754, -87.4736	645.997	10.755	70.866	5.602	18	0
HILLSBORO 7.4 SSW	34.5382, -87.2378	699.147	10.446	124.016	5.996	2	0
HILLSBORO 4.1 SSW	34.5807, -87.2063	748.032	9.666	172.901	6.021	8	0
MOULTON 2	34.4883, -87.2989	622.047	12.184	46.916	6.054	4901	1
MUSCLE SHOALS 3 NE	34.7889, -87.5394	534.121	14.123	41.01	6.935	37	0
MUSCLE SHOALS AP	34.7439, -87.5997	543.963	15.52	31.168	7.468	65	0
BELLE MINA 2 N	34.6892, -86.8819	603.018	26.452	27.887	12.641	1	0

C

Appendix C - Site Photographs

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Photograph 1 – W001, Forested (PFO1C), facing east.

Photograph 2 – W002b, Emergent (PEM1C), facing east.

Photograph 3 – W002a, Forested (PFO1C), facing west.

Photograph 4 – W003, Forested (PFO1C), facing northwest.

Photograph 5 – E001, R6, facing southeast.

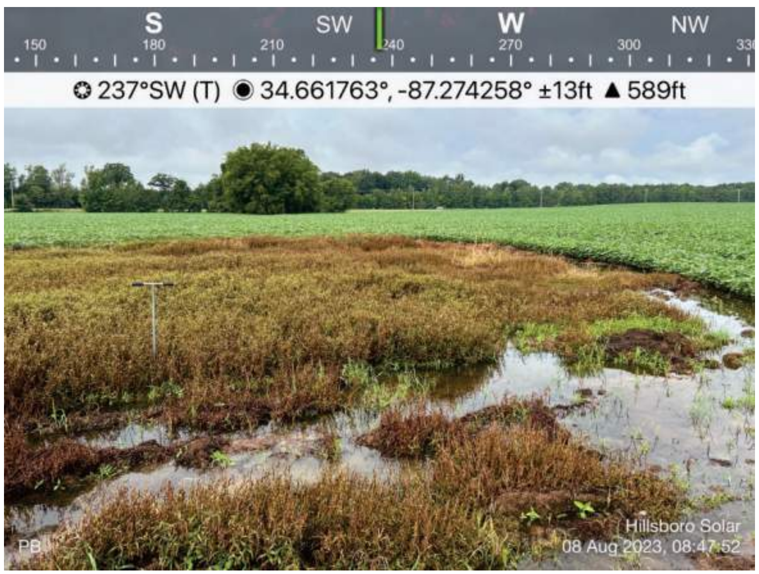
Photograph 6 – E001, R6, facing northwest.

Photograph 7 – W004, Scrub-Shrub (PSS1C), facing southwest.

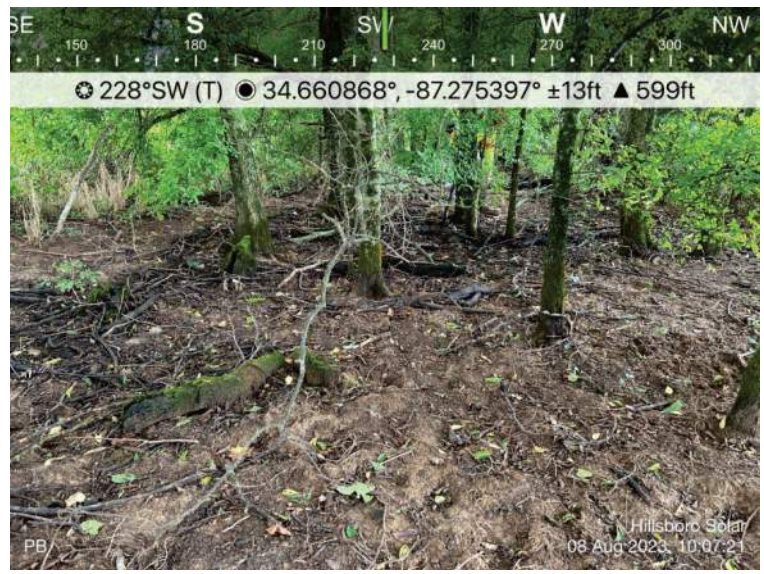
Photograph 8 – E002, R6, facing north.

Photograph 9 – E002, R6, facing south.

Photograph 10 – E002, R6, facing northeast.



Photograph 11 – W005a, Emergent (PEM1C), facing southwest.

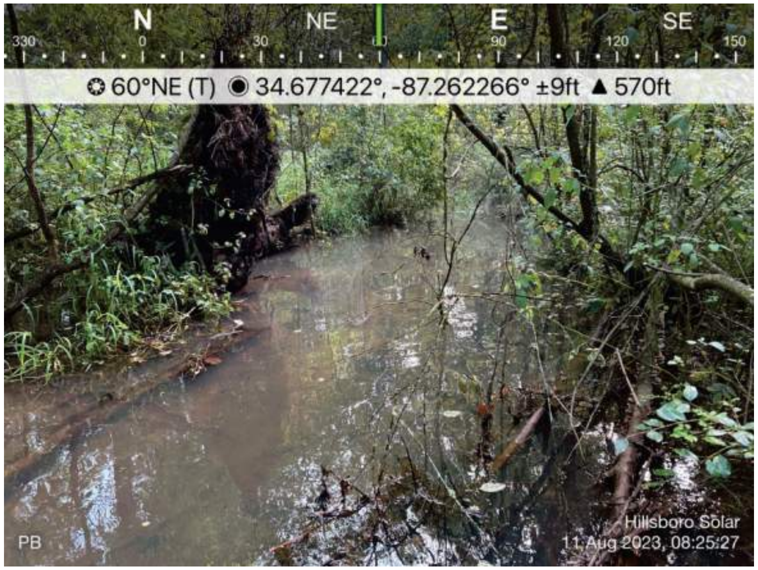


Photograph 12 – W005b, Forested (PFO1C), facing southwest.

Photograph 13 – W005c, Emergent (PEM1C), facing east.

Photograph 14 – S001, Intermittent, facing downstream.

Photograph 15 – S002, Intermittent, facing upstream.



Photograph 16 – S003, Perennial, facing upstream.

Photograph 17 – E003, R6, facing downstream.

Photograph 18 – E003, R6, facing upstream.

Photograph 19 – S004, Perennial, facing upstream.

Photograph 20 – S005, Intermittent, facing upstream.

Photograph 21 – W006, Forested (PFO1E), facing east.

Photograph 22 – W007, Emergent (PEM1E), facing southeast.

Photograph 23 – S006, Perennial, facing upstream.

Photograph 24 – P001, facing south.

Photograph 25 – W008, Forested (PF01E), facing south.

Photograph 26 – W008, Forested (PF01E), facing southwest.

Photograph 27 – S007, Intermittent, facing upstream.

Photograph 28 – W009, Emergent (PEM1C), facing south.

Photograph 29 – W010, Emergent (PEM1C), facing southwest.

Photograph 30 – E004, R6, facing south.

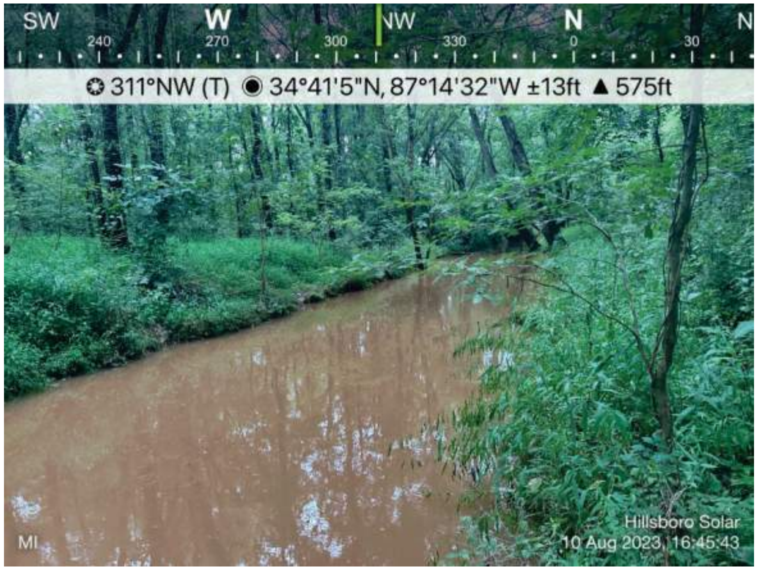
Photograph 31 – E004, R6, facing north.

Photograph 32 – E005, R6, facing east.

Photograph 33 – E005, R6, facing west.

Photograph 34 – S006, Perennial, facing upstream.

Photograph 35 – W011, Scrub-Shrub (PSS1E), facing south.



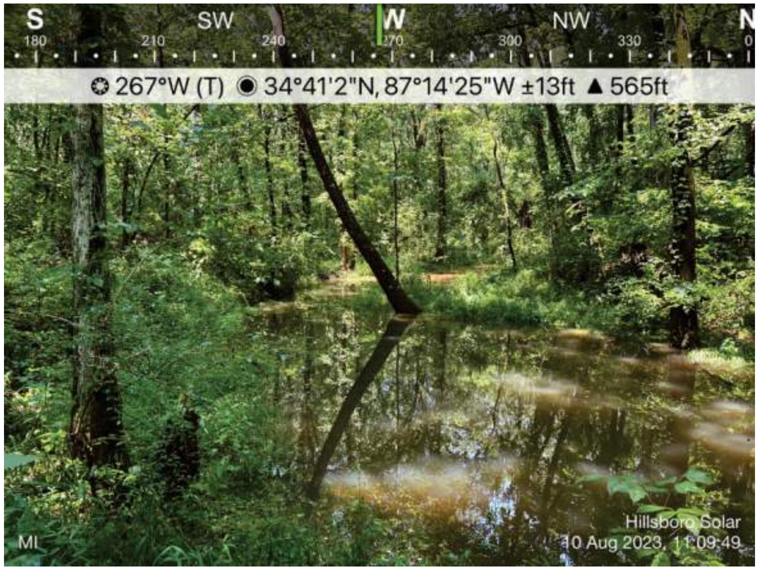
Photograph 36 – S008, Perennial, Wheeler Branch.

Photograph 37 – W012, Forested (PFO1B), facing east.

Photograph 38 – W012, Forested (PFO1B), facing east.

Photograph 39 – W013, Forested (PFO1C), facing northeast.

Photograph 40 – W013, Forested (PFO1C), facing northeast.



Photograph 41 – S009, Perennial, facing downstream.

Photograph 42 – S010, Intermittent, facing upstream.

Photograph 43 –E008, R6, facing upstream.

Photograph 44 – E008, R6, facing downstream.

Photograph 45 – E006, R6, facing upstream.

Photograph 46 – E006, R6, facing downstream.

Photograph 47 – E007, R6, facing upstream.

Photograph 48 – E007, R6, facing downstream.

Photograph 49 – W015, Forested (PFO1C), facing east.

Photograph 50 – W015, Forested (PFO1C), facing northwest.

Photograph 51 –W014, Forested (PFO1C), facing southwest.

Photograph 52 – S008, Perennial, Wheeler Branch.

Photograph 53 – S011, Perennial, facing upstream.

Photograph 54 – W017, Forested (PFO1A), facing south.

Photograph 55 – W016, Scrub-Shrub (PSS1E), facing southwest.

Photograph 56 – W016, Scrub-Shrub (PSS1E), facing southwest.

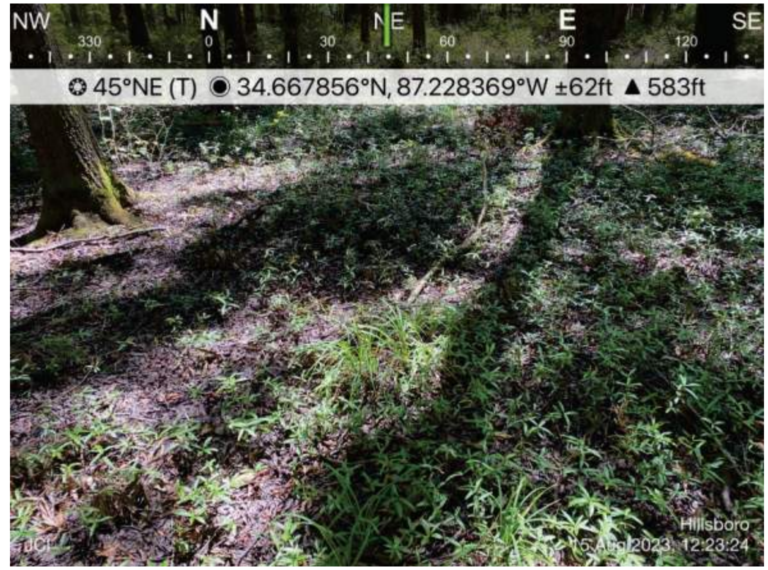
Photograph 60 – W017, Forested (PFO1A), facing northeast.

Photograph 61 – W017, Forested (PFO1A), facing west.

Photograph 62 – W018, Forested (PFO1C), facing east.

Photograph 63 – W018, Forested (PFO1C), facing southeast.

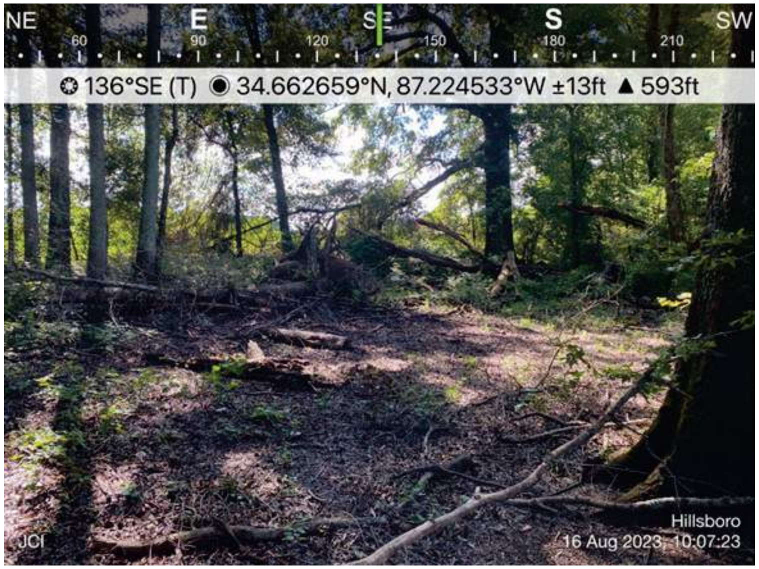
Photograph 64 – W019, Forested (PFO1C), facing east.



Photograph 65 – W020, Forested (PFO1E), facing northeast.

Photograph 66 – W020, Forested (PFO1E), facing north.

Photograph 67 – W020, Forested (PFO1E), facing north.



Photograph 68 – W021, Forested (PFO1E), facing southeast.

Photograph 69 – W022, Forested (PFO1E), facing northwest.

Photograph 70 – W023, Forested (PFO1E), facing north.

Photograph 71 – W025, Forested (PFO1E) facing west.

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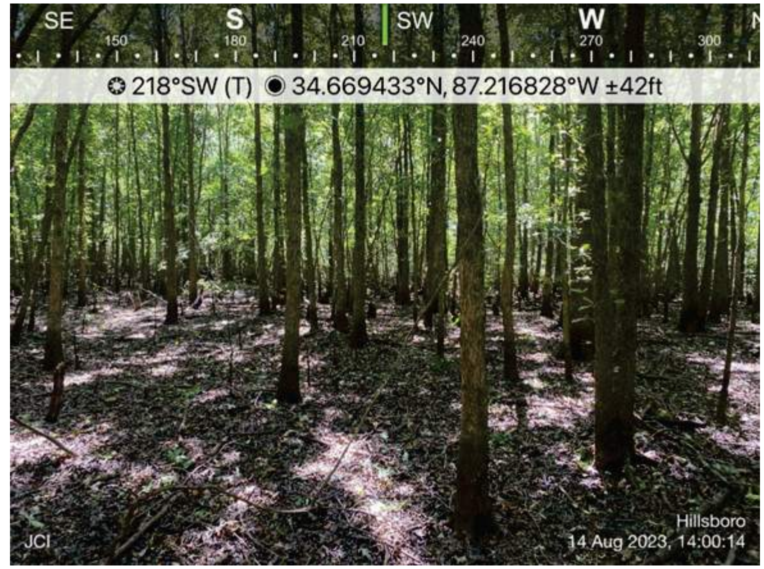
Photograph 73 – W027a, Forested (PFO1E), facing west.

Photograph 74 – W027b, Emergent (PEM1E), facing west.

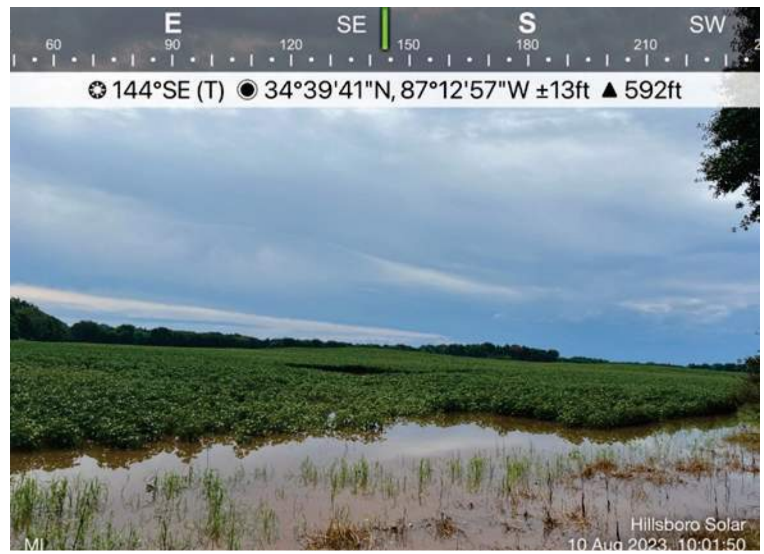
Photograph 75 – W029, Forested (PFO1E), facing north.

Photograph 76 – W024, Forested (PFO1E), facing south.

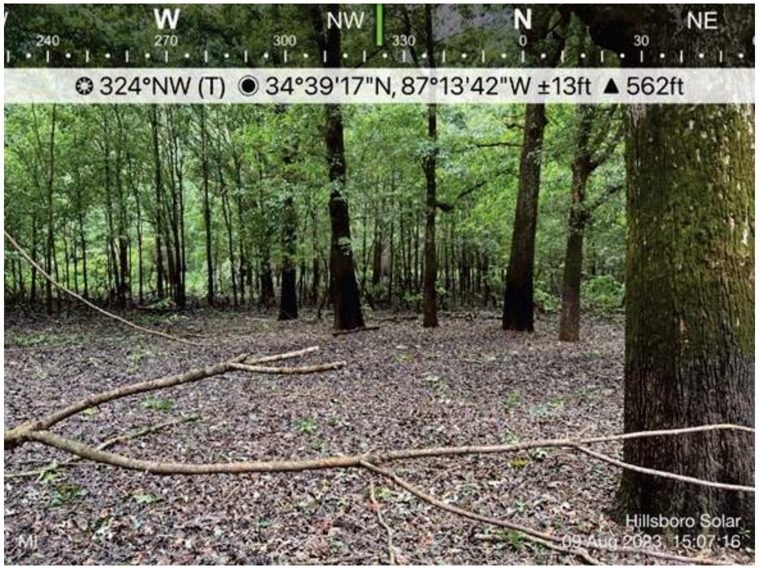


Photograph 77 – W024, Forested (PFO1E), facing southwest.

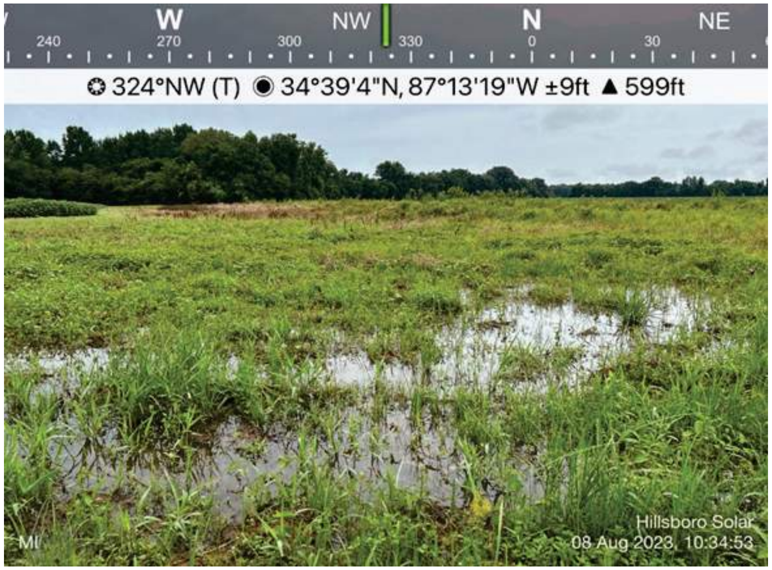
Photograph 78 – W024, Forested (PFO1E), facing southwest.



Photograph 79 – W024, Forested (PFO1E), facing southeast.



Photograph 80 – W028, Forested (PFO1E), facing northwest.



Photograph 81 – W030a, Emergent (PEM1E), facing northwest.

Photograph 82 – W030b, Forested (PFO1E), facing east.

Photograph 83 – W024, Forested (PFO1E), facing north.

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Photograph 98 – E009, R6, facing downstream.

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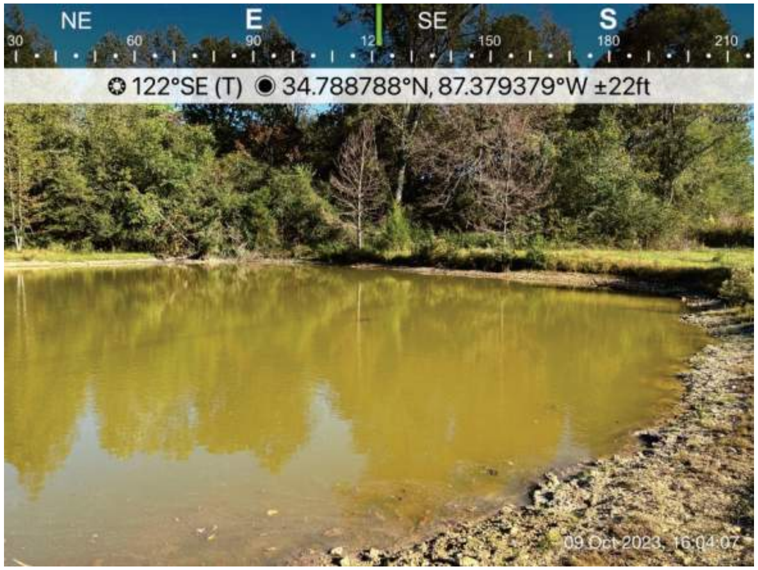

Photograph 100 – P003, facing southeast.

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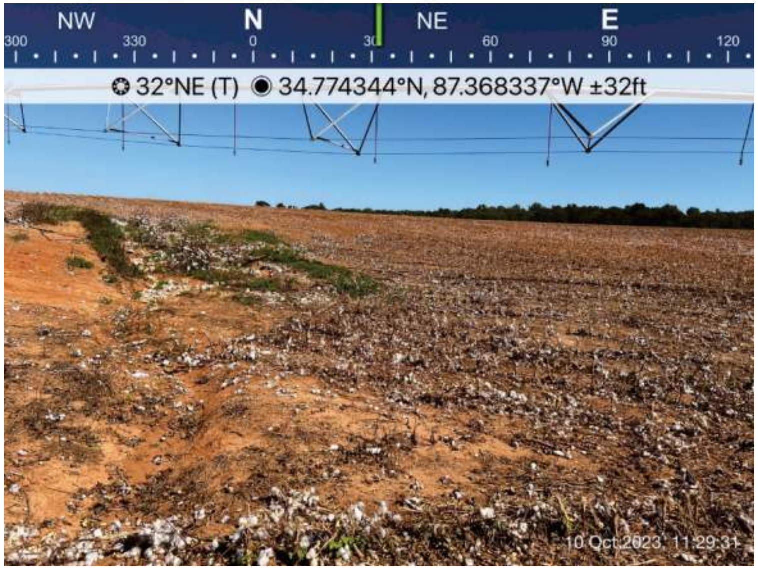
Photograph 102 – E010, R6, facing downstream.



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Photograph 105 – S012, Intermittent, facing upstream.

Photograph 106 – S012, Intermittent, facing downstream.

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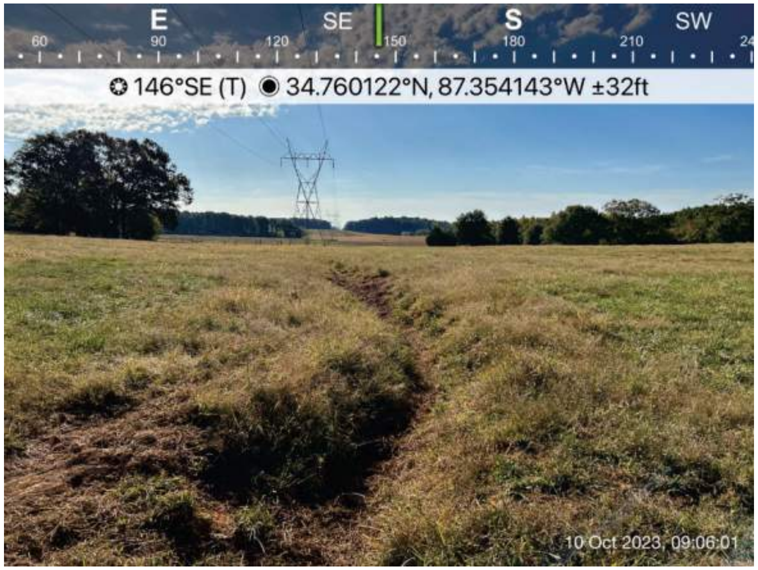

Photograph 110 – E013, R6, facing downstream.

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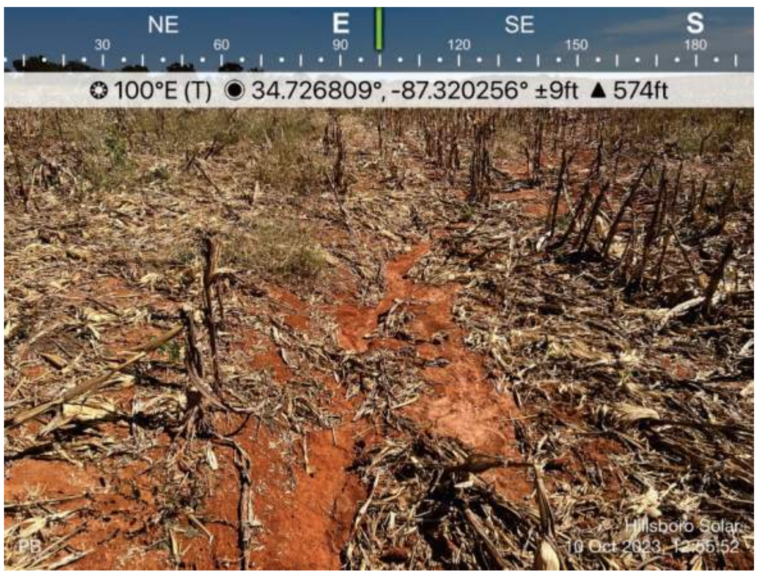
Photograph 117 – E016, R6, facing upstream.



Photograph 118 – E017, R6, facing downstream.

Photograph 119 – E017, R6, facing upstream.

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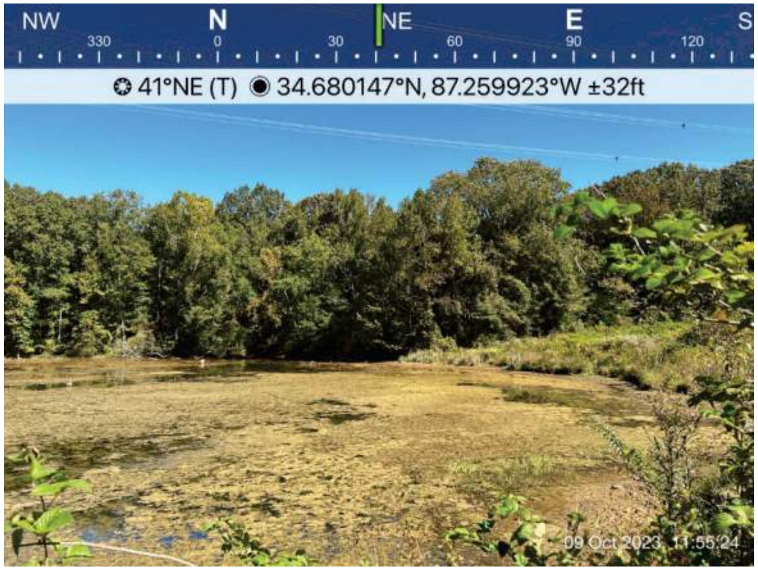
Photograph 121 – W037, Emergent (PEM1C), facing southwest.



Photograph 122 – P004, facing northeast.

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Appendix B – Biological Resources-Related Supporting Information

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Vegetation and Wildlife Assessment

Urban Grid Hillsboro Solar

Lawrence County, Alabama

January 6, 2025

Contents

Tables

Appendices

List of Acronyms and Abbreviations

°F	Degrees Fahrenheit
ADCNR	Alabama Department of Conservation and Natural Resources
ALIPC	Alabama Invasive Plant Council
APA	Alabama Plant Atlas
BGEPA	Bald and Golden Eagle Protection Act
Biotope	Biotope Forestry and Environmental
DBH	diameter at breast height
EO	Executive Order
ESA	Endangered Species Act
HDR	HDR Engineering, Inc.
HUC	Hydrologic Unit Code
IDS	International Dendrology Society
IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NHP	Natural Heritage Program
NLEB	Northern long-eared bat
ROW	Right-of-way
RNHD	Regional Natural Heritage Database
TVA	Tennessee Valley Authority
TL	Transmission line
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

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1 Introduction

On behalf of Urban Grid, HDR Engineering, Inc. (HDR) conducted a vegetation and wildlife assessment for a proposed solar photovoltaic facility known as Hillsboro Solar to be built in Lawrence County, Alabama (Project). Hillsboro Solar would be constructed within a Project Site of approximately 3,779 acres to develop the 200-megawatt alternating current solar facility. The Project Site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro (Appendix A, Figure 1). Hillsboro Solar would sell power to Tennessee Vally Authority (TVA) and would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which extends through the Project Site. TVA would modify approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL and may also improve associated access routes (TL Upgrade Areas). Together, the Project Site (3,779 acres) and the TL Upgrade Areas (145 acres) total 3,924 acres and are referred to herein as the Study Area.

Because TVA proposes to purchase the power generated by the solar facility and modify its transmission system to transmit the power, the Project is subject to review under the National Environmental Policy Act (NEPA) and must obtain applicable permitting. To facilitate compliance with NEPA, the Endangered Species Act (ESA) and Executive Order (EO) 13571, and in accordance with TVA's *Contractor Guidelines for Conducting Biological and Cultural Surveys and Impact Analyses* (TVA 2023 Guidelines; TVA 2023a), HDR collected information on the composition and structure of plant communities within the Study Area. Additionally, general wildlife and threatened and endangered species surveys were performed to characterize the existing environment and potential presence of protected resources, determine potential impacts, and recommend suitable mitigation measures. The results of this vegetation and wildlife habitat assessment are presented below and supporting information is attached in Appendices A through G.

1.1 Study Area

The Project Site is located just northwest of the Town of Hillsboro and approximately four miles south of Wheeler Reservoir (Tennessee River) in Lawrence County, Alabama (site coordinates 34.6633°, -87.2464°). The TL Upgrade Areas extend from the Project Site in a northwest direction to Wheeler Reservoir (from 34.6799°, -87.2581° to 34.7958°, -87.3829°). A Study Area vicinity map and topographic maps are included in Appendix A, Figure 1 and Figure 2.

The Project Site predominately consists of agricultural fields used for cotton, soybean, and corn production, and forested areas. Most forested stands are located on the eastern half of the Project Site. The terrain is characterized as gently sloping, with elevations ranging from 570 to 620 feet above mean sea level. The Project Site is located in the Red Branch Spring Creek Watershed (Hydrologic Unit Code [HUC] 12: 060300021201), the Dry Creek-Mallard Creek Watershed (HUC 12: 060300021106), and the Lower Big Nance Creek Watershed (HUC 12: 060300050105). On-site photographs are included in Appendix B.

The TL Upgrade Areas predominately consist of agricultural fields used for soybean and corn production, open pasture, and maintained TVA right-of-way (ROW). The terrain is characterized as gently sloping, with elevations ranging from 550 to 590 feet above mean sea level. The TL

Upgrade Areas are located in the Red Branch Spring Creek Watershed (HUC 12: 060300021201), the Lower Big Nance Creek Watershed (HUC 12: 060300050105), and the McKieman Creek-Tennessee River Watershed (HUC 12: 060300050801). On-site photos are included in Appendix B.

1.2 Qualifications

Vegetation and wildlife surveys were conducted by HDR environmental scientists Lyranda Thiem (MS, QHP-IT), Johanna Velasquez, Ethan Lawton, and Rebekkah Riley (MS, QHP-IT) and consulting botanist, Al Schotz. Environmental scientists leading the field assessments have undergone appropriate training and have prior experience in identifying and assessing vegetation communities, as well as endangered animal species and habitats in the region, and meet the TVA qualifications requirements for their respective discipline areas, as given in the TVA 2023 Guidelines.

2 Vegetation Field Survey

2.1 Methods

Following TVA 2023 Guidelines, HDR reviewed the TVA Regional Natural Heritage Database (RNHD) for all federal, state, and sensitive plant species listed as potentially occurring in the Project Site and the surrounding five-mile vicinity (TVA 2022b); the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) for federally threatened and endangered plants (USFWS 2022); and the Alabama Natural Heritage Program (NHP) for state-listed plant species occurring in Lawrence County (Auburn 2022). The federally and state-listed plant species are included in Appendix C.

On August 14-16, 2023, October 9-11, 2023, November 15-17, 2023, and March 22-25, 2024, field surveys were conducted following TVA 2023 Guidelines to map vegetation communities, including rare plant communities; document invasive species; identify potentially suitable habitat for federally and state-listed threatened and endangered species; and document incidental observations of those plant species in the Study Area. Field survey activities investigated a 3,960-acre site which extended beyond the limits of the current Study Area. Preliminary design efforts for the solar facility aiming at avoiding and minimizing impacts, reduced the Project Site to 3,779 and thus the Study Area to 3,924 acres. Observed plant communities were classified using the National Vegetation Classification System (Grossman et al. 1998), delineated using ESRI Field Maps, and the extent of each plant community type was calculated as a percentage of the total acreage of the Study Area. The general location and extent of invasive plants identified within the Project Site were noted in the field and are discussed below. Photos of observed plant communities are presented in Appendix B. The vegetation assessment report compiled by the consulting botanist is provided in Appendix G.

2.2 Results

2.2.1 Vegetation Communities

Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types within the Study Area were classified as listed in Table 1 and illustrated in Figure 3 (Appendix A). The total vegetated area encompasses 3,914 acres of the 3,924-acre Study Area. The diversity of vegetation community types identified in the Study Area is a result of topography, landscape position, soil types, and current and previous land use. Old growth forests were not documented as occurring within the Project Site. The plant communities observed on the Project Site are common and well represented throughout the region.

Table 1. Vegetation Communities Identified in the Hillsboro Solar Study Area

Plant Community	Area (acres)	Percentage Total
Agricultural/Maintained Lawn	2,896.5	74.0
Mixed Wet Deciduous Forest	474.4	12.1
Mixed Dry Deciduous Forest	321.4	8.2
Clearcut Forest[1]	184.2	4.7
Evergreen Forest	38.3	1.0
Total	**3,914[2]**	**100**

[1] Not defined as a vegetation community under Grossman et al. (1998)
[2] 10 acres of the Study Area consist of industrial land.

The dominant land use within the Study Area consists of agricultural fields, accounting for 74.0 percent (2,897 acres) of the Study Area, for the production of soybean, cotton, and corn. Plant species found along the edges of the agricultural fields include common pioneering species such as broomsedge (*Andropogon virginicus*), fleabane (*Erigeron* spp.), pigweed (*Amaranthus retroflexus*), clover (*Trifolium* spp.), Chinese bushclover (*Lespedeza cuneata*), and foxtail grass (*Alopercurus* spp.) (Appendix B, Photo 1).

Totaling approximately 12.1 percent (474 acres) of the Study Area, mixed wet deciduous forests are scattered throughout the Project Site with larger stands occurring in the northern, central, and eastern areas. Several of these stands of mixed wet deciduous forest are also classified as wetlands. No mixed wet deciduous forests were identified in the TL Upgrade Areas. There are also several smaller stands located on the southern boundary of the Project Site along Alabama Highway 20. Common canopy species include swamp tupelo (*Nyssa biflora*), black gum (*N. sylvatica*), sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), green ash (*Fraxinus pennsylvanica*), American sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), water oak (*Quercus nigra*), willow oak (*Q. phellos*), and ironwood (*Ostrya virginiana*). Average diameter at breast height (DBH) of canopy species is approximately 14 inches. Understory shrubs, vines, and sapling species include green ash, blackberries (*Rubus* spp.), poison ivy (*Toxicodendron radicans*), Japanese siltgrass (*Microstegium vimineum*), catbriar (*Smilax glauca*), and sedges (*Carex* spp.) (Appendix B, Photo 2).

Mixed dry deciduous forest stands comprising approximately 8.2 percent (321 acres) of the Study Area are present in the northwestern and eastern portions of the Project Site. No dry deciduous forest stands were identified in the TL Upgrade Areas. Common canopy species include southern red oak (*Quercus falcata*), white oak (*Q. alba*), post oak (*Q. stellata*), common hackberry (*Celtis occidentalis*), sugar hackberry (C. *laevigata*), loblolly pine, sugar maple (*Acer saccharum*), green ash, American beech (*Fagus grandifolia*), and eastern red cedar (*Juniperus virginiana*). Average DBH of canopy species is approximately 18 inches. Understory shrubs, vines, and sapling species present consisted of southern red oak, green ash, Chinese privet (*Ligustrum sinense*), blackberries, Virginia creeper (*Parthenocissus quinquefolia*), summer grape (*Vitis aestivalis*), muscadine (*V. rotundifolia*), wintergreen (*Gaultheria procumbens*), poison ivy, Japanese honeysuckle (*Lonicera japonica*), trumpet vine (*Campsis radicans*), catbriar (*Smilax* spp.), sedges, and other unidentified grass species (Appendix B, Photo 3).

A single stand of evergreen forest, approximately one percent (38 acres) of the Study Area, was observed along the eastern border of the Project Site, consisting of approximately one percent of the Study Area. Loblolly pine was the dominant canopy species in this vegetation community with an average DBH of approximately 18 inches. Understory shrubs, woody vines, herbs, and sapling species included pepper vine (*Nekemias arborea*), Japanese stilt grass, Virginia creeper, catbriar, and poison ivy (Appendix B, Photo 4).

Several areas from which forests have been recently harvested by clearcutting account for approximately 4.7 percent (184 acres) of the Study Area and occur in the southwest portion of the Project Site. Revegetation in these areas primarily consists of early successional and scrub-shrub plant communities. Plant species observed included saplings of red maple, trumpet vine, Japanese honeysuckle, broomsedge, blackberries, Chinese bushclover, sumac (*Rhus* spp.), sassafras (*Sassafras albidum*), ironweed (*Vernonia fasculata*), giant goldenrod (*Solidago gigantea*), pokeweed (*Phytolacca american*a), autumn olive (*Elaeagnus umbellata*), horseweed (*Erigeron canadensis*), common thistle (*Cirsium vulgare*), and corn salad (*Valerianella locusta*) (Appendix B, Photo 5). Average DBH of occasional small canopy species is approximately seven inches.

2.2.1.1 NOTABLE PLANT COMMUNITIES

No unusual plant communities were observed in the Study Area.

2.2.2 Federal Noxious Weeds and Non-Native and Invasive Plants

No federal noxious weeds as defined by the U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS 2012) were observed during field surveys. Eleven non-native plant species were documented on the Project Site: Japanese honeysuckle, Chinese bushclover, autumn olive, Johnson grass, Chinese privet, Japanese stiltgrass, white clover, ryegrass, burweed, paper mulberry (*Broussonetia papyrifera*), and periwinkle (*Vinca minor*). Japanese honeysuckle, Chinese privet, and Japanese stiltgrass are on the Alabama Invasive Plants Council (ALIPC 2012) list of invasive plants. These species are most often found in ruderal forested areas, along field edges, and in areas prone to disturbance (edges of agricultural fields). Invasive plants were found in forested areas.

Non-native or invasive species identified by the consulting botanist on the Project Site include Chinese privet, Japanese honeysuckle, paper mulberry, and periwinkle. These species were found in dense impenetrable thickets throughout the mixed dry deciduous forests and in two small forest stands within the Study Area. Non-natives were abundant in the northwestern and northeastern, and eastern portions of the Project Site, and were minimal in the southwest and north-central areas of the Project Site, as described in Appendix G. Given the remaining areas are agricultural, non-natives were mainly identified in forested areas.

2.2.3 Listed and Protected Species

Table 2 lists the federally and state-listed plant species potentially occurring on or in the vicinity of the Study Area based on data from the USFWS IPaC (USFWS 2023), the Alabama NHP Rare Species database for state-protected species in Lawrence County, Alabama (Auburn 2022), and the TVA RNHD (TVA 2023b) (Appendix C). Specific locations of previously documented plant occurrences are not available from TVA RNHD or the Alabama NHP, but likelihood of species occurrence can be estimated by matching species habitat requirements with land cover types and vegetation communities. The potential occurrence of these plants is described in more detail below. No federally designated critical habitat for plant species is present within the Project Site or TL Upgrade Area.

Table 2. Protected Plant Species Potentially Occurring within the Study Area

Common Name ***Scientific Name***	**State Rank and Listing Status**[1]	**Federal Listing Status**[2]	**Likelihood of Occurrence**	**Habitat Description**
Plants				
Alabama Glade-cress *Leavenworthia alabamica*	S2	--	Unlikely	Limestone outcrops and cedar glades.
Alabama Larkspur *Delphinium alabamicum*	S3	--	Unlikely	Calcareous and prairie woods.
Allegheny-spurge *Pachysandra procumbens*	S2S3	--	Likely	Rich woods.
Bradley's Spleenwort *Asplenium bradleyi*	S2	--	Unlikely	Crevices on acidic rock outcrops, particularly on steep sandstone cliffs, in exposed, barren areas, sometimes in full sun.
Bristle Fern *Trichomanes boschianum*	S3	--	Unlikely	Rocky seeps.
Butler's Quillwort *Isoetes butleri*	S2	--	Unlikely	Thin, seasonally saturated soil over exposed limestone or dolomite bedrock.
Canada lily *Lilium canadense*	S2	--	Likely	Wet meadows, edges of moist rich woods and forests, streamside flats, bogs, marshes, swamps, and ditches along wet roadsides.
Carolina Anemone *Anemone caroliniana*	S3	--	Unlikely	Glades and cedar woodlands.
Carolina Gentian *Frasera caroliniensis*	S2	--	Unlikely	Upland savannas, upland woodlands, wooded slopes, limestone and sandstone glades, woodland openings, and small meadows in upland wooded area.
Cumberland Rosinweed *Silphium brachiatum*	S2	--	Unlikely	Rich rocky woods.
Duck River Bladderpod *Lesquerella densipila*	S1	--	Unlikely	Cedar glades with thin soil over limestone, open alluvial sites, stream bottoms, fallow fields
Dutchman's Breeches *Dicentra cucullaria*	S2	--	Unlikely	Forest floors, rocky woods, slopes, ledges, valleys, ravines and along stream
Dwarf Filmy-fern *Trichomanes petersii*	S2	--	Unlikely	Rocky seeps.

Common Name ***Scientific Name***	**State Rank and Listing Status[1]**	**Federal Listing Status[2]**	**Likelihood of Occurrence**	**Habitat Description**
Eggert's sunflower *Helianthus eggertii*	S2	DL	Likely	Barrens and roadsides.
Eggleston's Violet *Viola egglestonii*	S1	--	Unlikely	Limestone cedar glades.
Elliott's fan-petal *Sida elliottii*	S3	--	Likely	Disturbed sites, stream banks, grasslands, open, shrubby areas, prefers sandy soil.
Fleshy-fruit gladecress *Leavenworthia crassa*	--	FE	Unlikely	Limestone outcroppings with exposed rock and shallow soil.
Gattinger's Prairie Clover *Dalea gattingeri*	S3	--	Unlikely	Dry, calcareous, rocky limestone glades
Glade Beardtongue *Penstemon tenuiflorus*	S2S3	--	Unlikely	Limestone glades and woodlands.
Golden Seal *Hydrastis canadensis*	S2	--	Unlikely	Mesic hardwood forests.
Goldie's woodfern *Dryopteris goldiana*	S1	--	Likely	Hardwood forest, ravines, along streams, swamp and seep edges.
Gorge Filmy Fern *Hymenophyllum tayloriae*	S1	--	Unlikely	Moist rock houses.
Harper's Grooved-yellow Flax *Linum sulcatum var. harperi*	S1	--	Unlikely	Gravel hill prairies, gravel prairies, gravelly slopes along rivers, loess hill prairies, sandy hill prairies, upland sand prairies, and limestone glades.
Harper’s Umbrella Plant *Eriogonum harperi*	S1	--	Unlikely	Rocky bluffs.
Lake Cress *Armoracia lacustris*	S1	--	Unlikely	Quiet water, springs, lakes and sluggish, slow-moving streams, and muddy shores.
Large whorled pogonia *Isotria verticillata*	S2	--	Likely	Mesic to dry forests and woodlands, and occasionally in bogs.
Leafy Prairie Clover *Dalea foliosa*	S1	--	Unlikely	Rocky washes in glades.

Common Name *Scientific Name*	**State Rank and Listing Status[1]**	**Federal Listing Status[2]**	**Likelihood of Occurrence**	**Habitat Description**
Limestone Adder's-tongue *Ophioglossum engelmannii*	S3	--	Unlikely	Dry barrens and glades in calcareous areas.
Limestone Fame-flower *Phemeranthus calcaricus*	S2	--	Unlikely	Glades.
Little Mountain Meadowrue *Thalictrum mirabile*	S2	--	Unlikely	Wet sandstone bluffs, sinks, and rocky crevices.
Log fern *Dryopteris celsa*	S2	--	Likely	Moist woods and swamps.
Lyrate Bladderpod *Paysonia lyrata*	S1	--	Unlikely	Open cedar glades and other open habitat, such as pastures, often with red-colored and limestone-derived soils.
Lyre-leaf Bladderpod *Lesquerella lyrata*	--	FT	Unlikely	Open cedar glades and other open habitat, such as pastures, often with red-colored and limestone-derived soils.
Menge's Fame-flower *Phemeranthus mengesii*	S3	--	Unlikely	Dry rock ledges.
Michaux Leavenworthia *Leavenworthia uniflora*	S2	--	Unlikely	Rocky ledges, cedar glades, pastures, roadsides, old fields, thin soil on limestone beds, seeps on limestone rubble.
Mountain camellia *Stewartia ovata*	S2S3	--	Likely	Forest understory or at the edges of openings along streams.
Narrow-leaved glade fern *Diplazium pycnocarpon*	S1S2	--	Likely	Rich, moist deciduous forest, wooded bluffs.
Nashville Breadroot *Pediomelum subacaule*	S2	--	Unlikely	Limestone cedar glades.
Nodding Trillium *Trillium flexipes*	S2S3	--	Unlikely	Rich deciduous woodlands, wooded slopes, large shady ravines, and rocky bluffs.
Prairie Indian Plantain *Arnoglossum plantagineum*	S1	--	Unlikely	Moist prairies and marshes.
Prairie trillium *Trillium recurvatum*	S2	--	Likely	Rich, open deciduous woodlands and savannas.

Common Name ***Scientific Name***	**State Rank and Listing Status[1]**	**Federal Listing Status[2]**	**Likelihood of Occurrence**	**Habitat Description**
Prairie-dock *Silphium pinnatifidum*	S2	--	Unlikely	Prairies, barrens, and cedar glades.
Prices's potato-bean *Apios priceana*	S2	FT	Likely	Openings in rich woods.
Puttyroot *Aplectrum hyemale*	S2	--	Likely	Rich, mostly mesic, deciduous woodlands and the lower slopes of moist ravines.
Rock Clubmoss *Huperzia porophila*	S1	--	Unlikely	Moist, sheltered cliffs, usually on sandstone bedrock.
Roundleaf catchfly *Silene rotundifolia*	S1S2	--	Likely	Woodlands and around shaded cliffs.
Round-leaved Sundew *Drosera rotundifolia*	S1	--	Unlikely	Bogs and seeps.
Shining Clubmoss *Huperzia lucidula*	S2	--	Unlikely	Conifer, mixed or hardwood forest, shaded slopes, bogs, and conifer swamps.
Soft False Gromwell *Onosmodium molle ssp. molle*	S2	--	Unlikely	Dry to mesic sandy or gravelly prairies and open woods.
Southern Meadowrue *Thalictrum debile*	S2	--	Unlikely	Moist to dry forests, woodlands, and barrens, over mafic or ultramafic bedrock.
Southern twayblade *Listera australis*	S3	--	Likely	Wet-mesic woods.
Spring avens *Geum vernum*	S1	--	Likely	Floodplains and rich woods.
Sunnybell *Schoenolirion croceum*	S2	--	Unlikely	Limestone outcrops.
Sweet pinesap *Monotropsis odorata var. odorata*	S1	--	Likely	Piney woods.
Tennessee Milkvetch *Astragalus tennesseensis*	S1S2	--	Unlikely	Glades.

Common Name ***Scientific Name***	**State Rank and Listing Status[1]**	**Federal Listing Status[2]**	**Likelihood of Occurrence**	**Habitat Description**
Water Stitchwort *Stellaria fontinalis*	S1	--	Unlikely	Seeps and limestone creek beds.
Wherry's Phloxy *Phlox pulchra*	S1	--	Unlikely	Wood margins and wood openings in moderately acid soils.
White trout lily *Erythronium albidum*	S1S2	--	Likely	Moist woods, on wooded slopes and bluffs, and along streams.
Yellow Lady's-slipper *Cypripedium pubescens*	S3	--	Unlikely	Cypripedium parviflorum var. pubescens grows in boggy areas, swampy areas, damp woods, often with a rich layer of humus and decaying leaf litter, near rivers or canal banks.
Yellow Sunnybell *Schoenolirion croceum*	S2	--	Unlikely	Wet areas in glades.

Sources: AUMNH 2022; TVA 2023b; USFWS 2023a
[1] SP = State Protected; S1 = Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few individuals, or because of some special condition where the species is particularly vulnerable to extinction; S2 = Very rare and imperiled in the state, 6–20 occurrences, or few remaining individuals, or because of some factor(s) making the species vulnerable to extinction; S3 = Rare and uncommon in the state, 21–100 occurrences; SX = Presumed Extirpated.
[2] FE = Federally Endangered; FT = Federally Threatened; FPE = Federally Proposed as Endangered; FC = Federal Candidate for Listing; DL = Delisted; UR = under review for federal listing.

None of the species listed in Table 2 were observed during the August 2023 field survey by HDR or during the March 2024 field survey by the consulting botanist. Although no species were observed directly, suitable habitat for the species listed in Table 2 described below exist on the Project Site. No suitable habitat was observed for several species listed in Table 2.

Allegheny spurge is a native herbaceous evergreen perennial that grows in rich, mature, deciduous forests, often near the bottom of slopes (APA 2023). Alabama spurge occurs in the northern third of Alabama and in the Red Hills and Chunnenuggee Ridge area of central Alabama.

Canada lily is a large flowering perennial that grows in wet meadows, edges of moist rich woods and forests, streamside flats, bogs, marshes, swamps, and ditches along wet roadsides (APA 2023).

Eggert's sunflower is a perennial species in the aster family (Asteraceae) found only in the Interior Low Plateaus of Kentucky, Tennessee, and Alabama where it occurs in barrens habitat and alongside roads (NatureServe 2023). Eggert's sunflower was previously listed as threatened under the ESA but was delisted in 2005 based on its successful recovery.

Elliott's fan-petal is a native perennial herb or subshrub with a tap root that can be found at scattered locations across Alabama (APA 2023). This species occurs in prairies, in scrub oak woods, in sand hills, in xeric sandy longleaf pine (*Pinus palustris*) woods, and on disturbed sites.

Fleshy-fruit gladecress is a winter annual, spring-flowering member of the mustard family that is only found in Alabama. This species occurs in limestone outcroppings with exposed and shallow soil (USFWS 2023b). Potential habitat for this species was not identified within the Study Area.

Goldie's woodfern is a large, native, perennial fern that inhabits hardwood forest, ravines, along streams, swamp and seep edges (NatureServe 2023).

The large whorled pogonia is a perennial orchid that requires rich, deciduous or mixed, moist forest on sandy soil with abundant humus (NatureServe 2023).

Log fern is a semi-evergreen native perennial fern occurs in scattered locations across Alabama (APA 2023). Log fern grows around lime sinks and caves, along small to medium sized streams, and in rich hardwood forest often near limestone.

Mountain camellia is a small tree native in low to mid-elevations in the southern Appalachian Mountains and nearby regions from Mississippi to Virginia (IDS 2023). This species can be found in the forest understory or at the edges of openings along streams.

Narrow-leaved glade fern is a perennial fern that inhabits rich, moist, deciduous forest and wooded bluffs (NatureServe 2023).

Prairie trillium is a perennial herb occurring on the floodplain, in rich woods and on bluffs within the Mississippi River Basin (NatureServe 2023). In Alabama, prairie trillium is generally found in prairie woods of the Black Belt or limestone calcareous woods of North Alabama (APA 2023).

Price's potato-bean is a perennial, climbing vine growing from a stout tuber (USFWS 2023b). Price's potato-bean grows in forest openings in mixed hardwood stands where ravine slopes grade into creek or stream bottoms.

Puttyroot is a perennial herb that occupies rich, mostly mesic, deciduous woodlands and the lower slopes of moist ravines (NatureServe 2023).

Southern twayblade is a native perennial orchid found throughout Alabama (APA 2023). Southern twayblade grows in wet hardwood or hardwood/evergreen forests, along streams, and in seeps.

Spring avens is a disturbance tolerant early successional species which is common throughout the Great Lakes region and eastern United States in mesic woods and roadsides (NatureServe 2023). This plant is considered rare only along the edges of its natural species range.

Sweet pinesap is a rare, herbaceous perennial wildflower occurring in piney woods throughout the southeast (USDA 2023).

White trout lily is a native perennial wildflower found in moist woods, on wooded slopes and bluffs, and along streams (NatureServe 2023).

3 Wildlife Survey

3.1 Methods

Following TVA 2023 Guidelines (TVA 2023a), HDR reviewed the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) for federally threatened and endangered species found within Lawrence County (USFWS 2023a), the Alabama NHP for state-listed species occurring in Lawrence County (Auburn 2022), and the TVA RNHD for all state-listed, protected, or candidates for listing terrestrial animal species found within three miles of the Study Area and all federally listed, federally protected, or candidate for federal listing terrestrial animal species found within Hardeman County. Listed species reports are included in **Appendix B**.

Pedestrian surveys for terrestrial wildlife were conducted simultaneously with the vegetation surveys described in Section **2**.1 and by the same HDR staff. The Study Area was also traversed by vehicle via existing roads. Visual (naked eye and binoculars) and auditory spot checks were performed in forested stands and along streams, drainageways, and the perimeters of cattle pastures. Isolated pockets of woodlands were inspected, and larger woodland blocks within the Project Site were also traversed for potential bat habitat identification and assessment.

A presence/absence mist-net survey for threatened and endangered bat species was carried out by Biotope Forestry & Environmental (Biotope) in August 2023 as part of the Section 7 ESA requirements for the Project. Eight mist-net sites were surveyed with five mist-nets for two calendar nights, totaling ten mist-net nights per site. Findings are summarized below; detailed methods and results are included in **Appendix E** (Biotope 2023).

Aquatic species surveys were conducted by TVA biologist, Todd Amacker, in the fall of 2023 and the spring of 2024 to verify the presence or absence of state- or federally listed aquatic species. TVA biologists determined Wheeler Branch to be the most likely to contain listed aquatic fauna on the proposed Project, and the waterbody was surveyed at location 34.6707°, -87.2434° (approximate coordinates of survey location).

3.2 Results

3.2.1 Observed Wildlife

Wildlife species either directly observed within the Study Area or whose evidence (i.e., tracks, scat, remains, burrows) was noted during the field survey are listed in Table 3.

Table 3. Wildlife Species Observed or Indicated at the Hillsboro Solar Study Area

Species Observed		Notes/Habitat Observed in Study Area
Common Name	**Scientific Name**	
Mammals		
White-tailed deer	*Odocoileus virginianus*	Observed on the edge of corn field
Birds		
Acadian flycatcher	*Empidonax virescens*	Observed and heard near forested and emergent wetlands.
American crow	*Corvus brachyrhynchos*	Observed and heard flying between forested edges and agricultural fields.
Baltimore oriole	*Icterus galbula*	Heard calling along forested tree line.
Barred owl	*Strix varia*	Heard calling within forested area.
Black vulture	*Coragyps atratus*	Observed flying over Project Site.
Carolina wren	*Thryothorus ludovicianus*	Observed and heard calling near agricultural field and forested edge.
Eastern wood pewee	*Contopus virens*	Observed and heard calling within forested areas.
Eastern towhee	*Pipilo erythrophthalmus*	Observed and heard calling within forested areas.
Field sparrow	*Spizella pusilla*	Heard calling near agricultural field and forested edge.
Gray catbird	*Dumetella carolinensis*	Heard calling near forested edge of Project Site.
Great blue heron	*Ardea herodias*	Observed flying overhead and standing along open water.
Indigo bunting	*Passerina cyanea*	Observed flying between cotton field and forested edge.
Mourning dove	*Zenaida macroura*	Observed on utility line over agricultural field.
Northern cardinal	*Cardinalis cardinalis*	Observed and heard calling within forested edges of Project Site.
Red-shouldered hawk	*Buteo lineatus*	Observed and heard flying over Project Site.
Summer tanager	*Piranga rubra*	Observed and heard over and near forested wetland.
Tufted titmouse	*Baeolophus bicolor*	Heard calling within forested areas of the Project Site.
Great egret	*Ardea alba*	Observed within open water edge of Project Site.
White-eyed vireo	*Vireo griseus*	Heard calling near forested edge and agricultural field.
Wood thrush	*Hylocichla mustelina*	Heard calling within forested edge of agricultural field.
Yellow warbler	*Setophaga petechia*	Observed flying within forested areas of Project Site.

Species Observed		Notes/Habitat Observed in Study Area
Common Name	**Scientific Name**	
Reptiles		
Black racer	*Coluber constrictor*	Observed crossing through forested upland and agricultural field edge.
Black rat snake	*Pantherophis obsoletus*	Observed crossing access road of Project Site.
Copperhead	*Agkistrodon contortrix*	Observed within forested area and on access road of Project Site.
Eastern cottonmouth	*Agkistrodon piscivorus*	Observed within forested wetland within Project Site.
Insects		
Cicadas	*Cicadoidea*	Heard calling throughout the Project Site.
Swallow tail butterfly	*Papilionidae*	Observed over cotton fields and near herbaceous edges of corn fields.
Evidence (i.e., scat, tracks, remains, burrows)		
Coyote tracks/scat	*Canis latrans*	Observed along field edges within the Project Site.
Nine-banded armadillo burrow	*Dasypus novemcintus*	Observed within several upland forested areas.
Racoon tracks	*Procyon lotor*	Observed along stream banks throughout the Project Site.
Osprey nests	*Pandion haliaetus*	Two nests observed on utility poles on the northwestern portion of the TL Upgrade Area.

3.2.2 Migratory Birds and Eagles

EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to further implement the Migratory Bird treaty Act (MBTA). The MBTA prohibits the “take” of migratory birds. The regulatory definition of “take” as defined by 50 CFR § 10.12, “means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue hunt, shoot, wound, kill, trap, capture, or collect.” The following prohibitions apply to migratory bird nests: “possession, sale, purchase, barter, transport, import and export, take, and collect.” The MBTA is executed and enforced by USFWS.

In addition to protection under the MBTA, bald and golden eagles are also protected under the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA states it is illegal to kill, harass, possess (without a permit), or sell bald and golden eagles and their parts.

Bald eagles typically utilize forested areas adjacent to large bodies of water for nesting habitat. Tall, mature coniferous or deciduous trees that afford a wide view of the surroundings are used as nest trees and roost trees (Audubon 2023). Bald eagles typically avoid heavily developed areas. Suitable nesting sites for bald eagles generally consists of prominent trees along or near reservoirs and large rivers which also provide winter habitat. Although bald eagles nest along Wheeler Reservoir, neither bald eagles nor their nests were sighted during the August and October 2023 field surveys, and it was determined that suitable foraging and nesting habitat do not occur within the Study Area.

The golden eagle is a rare winter resident in Alabama and most reports of the species have been in the vicinity of reservoirs. Non-breeding habitat includes a mix of forest and open habitats for foraging. Ideal breeding habitat for the golden eagle consists of cliffs and steep escarpments. Wintering habitat includes a mix of forest and open habitats for foraging. Winter roosting and foraging habitat is not available on the Study Area. Therefore, suitability of the Study Area as habitat for the golden eagle is low due to the absence of roosting and foraging habitat.

Approximately 283 birds have been identified in Lawrence County, Alabama (eBird 2023), and additional species may occur regularly. The USFWS maintains a list of migratory birds of conservation concern (USFWS 2021). These species are not listed under the ESA but are a high conservation priority of the USFWS and without additional conservation action are likely to become candidates for listing under the ESA. Twenty-three species of birds of conservation concern are listed for Bird Conservation Region 24 (BCR 24), Central Hardwoods, which encompasses the area of the Project Site. Of these 23 species, at least 10 potentially occur with some regularity on or in the immediate vicinity of the Study Area, based on habitat surveys (Table 4).

Several of the forested portions of the Project Site and agricultural fields provide suitable habitat for one or more of the birds listed in Table 4. Many additional migratory bird species not listed as a Birds of Conservation Concern likely also occur on the Project Site. Additional species of hawks and owls, woodpeckers, flycatchers, vireos, thrushes, and warblers may occur. In addition, osprey, also protected under the MBTA, typically inhabit areas along large rivers, lakes, and reservoirs. Osprey will nest on utility poles and other artificial structures within transmission lines. These poles and others in the TL Upgrade Areas provide suitable nest habitat and two nests were observed on these utility poles or other poles on the TL Upgrade Areas. The deciduous forests and agricultural fields also provide habitat for migratory birds with declining populations that are not listed as birds of conservation concern by the USFWS (2021).

Table 4. Migratory Bird Species of Conservation Concern Potentially Occurring or Confirmed Present in the Hillsboro Solar Study Area

Common Name	Scientific Name	General Habitat Description	Potential Habitat Present
Migrant Species (present as spring and fall migrant and/or during winter			
Bald eagle[1]	*Haliaeetus leucocephalis*	Nest in forested areas adjacent to large bodies of water. For perching they prefer tall coniferous or deciduous trees.	No
Bobolink	*Dolichonyx oryzivorus*	Open country with a preference for large hayfields, moist meadows and weedy fields dominated by a mixture of tall grasses	Yes
Semipalmated plover	*Charadrius semipalmatus*	Favors open habitats on migration, including broad mudflats, sandy beaches, lake shores, pools in salt marshes, and sometimes flooded or plowed fields.	No
Lesser yellowlegs	*Tringa flavipes*	Mudflats, sandy beaches, shores of lakes and ponds, and wet meadows.	No

Common Name	Scientific Name	General Habitat Description	Potential Habitat Present
Rusty blackbird[1]	*Euphagus carolinus*	Forested wetlands	Yes
Breeding Season Migrants (may occur only during the breeding season)			
Bachman's sparrow[1]	*Peucaea aestivalis*	Dry open pine or oak woods; nests on the ground in dense cover.	Yes
Chimney swift	*Chaetura pelagica*	Forages over variety of habitats, requires chimneys or large hollow tree snags with open tops for nesting.	Yes
Kentucky warbler	*Geothlypis formosa*	Large moist forest tracts with mature trees and thick understory.	Yes
Prairie warbler	*Dendroica discolor*	Various shrubby habitats, including regenerating forests, open brushy fields, and Christmas tree farms.	Yes
Prothonotary warbler	*Protonotaria citrea*	Forested wetlands with areas of standing water	Yes
Wood thrush	*Hylocichla mustelina*	Breeds in mature deciduous and mixed forests, forests with dense understory, and forest edges.	Yes[2]
Resident Species (may occur year-round)			
Brown-headed nuthatch[1]	*Sitta pusilla*	Open pine woods often mixed with deciduous trees.	No
Field sparrow[2]	*Spizella pusilla*	Found at all seasons in brushy overgrown fields, second growth, woodland edges, hedgerows, and sometimes around brushy edges of marshes.	Yes[2]
Red-headed woodpecker	*Melanerpes erythrocephalus*	Deciduous woodlands with oak or beech, groves of dead or dying trees, forested river bottoms, recent clearings, farmland, grasslands, forest edges and roadsides.	Yes

Source: USFWS 2021, 2023a; Audubon 2022
[1] Included based on IPaC report but uncommon to the Project Site based on the National Audubon Society range maps.
[2] Observed within the Project Site during field investigations.

3.2.3 Listed and Protected Species

Listed species are recognized by federal, state, or other agencies in an effort to protect them and their habitat under the federal ESA (1973), as well as under state laws and per local policies. These species are vulnerable to habitat loss and population decline because of their rarity. HDR's assessment also considered wildlife protected under the MBTA of 1918 (16 U.S.C. §§ 703-712), EO for Migratory Birds (E.O. 13186 of January 10, 2001), and the BGEPA of 1940 (16 U.S.C. 668-668d).

Table 5 provides a summary of the federally listed animal species that were identified on the USFWS IPaC report (2023a), Alabama NHP Rare Species database for state-protected species in Lawrence County, Alabama (Auburn 2022), and the TVA RNHD (TVA 2023b) with potential to occur within the Study Area based on observations of habitat during the field surveys. To determine likelihood of presence of species provided in the resource lists included in Appendix C, HDR conducted observational field assessments for protected terrestrial species. The survey focused on the general characteristics of land cover, vegetation communities, and wildlife habitats within and immediately adjacent to the Study Area.

No designated critical habitat for federally listed animal species occurs on or in the vicinity of the Study Area (USFWS 2023a). Species listed in Table 5 are described in Sections 3.2.3.1through 3.2.3.5 if suitable habitat was observed.

Table 5. Threatened, Endangered, and Other Protected Species Potentially Occurring in the Vicinity of the Study Area

Common Name ***Scientific Name***	**State Rank and Listing Status[1]**	**Federal Listing Status[2]**	**Likelihood of Occurrence[3]**	**Habitat Description**
Mammals				
Appalachian Cottontail *Sylvilagus obscurus*	S1	--	Unlikely	Montane areas of high elevation coniferous forests as well as areas providing dense cove
Eastern spotted skunk *Spilogale putorius*	S2S3	--	Likely	Rocky outcrops, open prairies, brushy areas, cultivated fields, and barnyards, pine forests.
Gray bat[4] *Myotis grisescens*	S2	FE	Known	Roosts in caves or karst features year-round. Various foraging habitats including wet meadows, damp woods, and uplands.
Indiana bat *Myotis sodalis*	S2	FE	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide.
Little brown bat *Myotis lucifugus*	--	UR	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide.
Northern long-eared bat *Myotis septentrionalis*	--	FE	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures, sinkhole/karst features; statewide.
Rafinesque's big-eared bat *Corynorhinus rafinesquii*	S2, SP	--	Likely	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide.
Tricolored bat[4] *Perimyotis subflavus*	--	FPE	Known	Generally associated with forested landscapes but may roost near openings.
Birds				
Red-cockaded Woodpecker *Dryobates borealis*	S2	FT	Unlikely	Mature pine forests with very open understory maintained by frequent fires.
Whooping Crane *Grus americana*	--	EXPN	Unlikely	Shallow markets with adjacent open grasslands.
Reptiles				
Alligator snapping turtle *Macrochelys temminckii*	S3, SP	PT	Unlikely	Inhabits large rivers, major tributaries, bayous, canals, swamps, lakes, ponds, and oxbows
Coal skink *Plestiodon anthracinus*	S3	--	Likely	Humid wooded areas with abundant leaf litter and loose rocks; vicinity of springs, swamps, and bogs.

Common Name ***Scientific Name***	**State Rank and Listing Status**[1]	**Federal Listing Status**[2]	**Likelihood of Occurrence**[3]	**Habitat Description**
Fish				
Bankhead darter *Percina sipsi*	S1	--	Likely	Found over gravel substrate in pools and the heads of riffles in creeks to medium rivers.
Flame Chub *Hemitremia flammea*	S3	--	Unlikely	Springs and spring-fed streams with lush aquatic vegetation.
Slackwater darter *Etheostoma boschungi*	S1, SP	FT	Likely	Gravel-bottomed creeks and small rivers; spawns in seepage water in fields and open woods.
Slender madtom *Noturus exilis*	S3	--	Likely	Riffles of small- to medium-sized permanent spring-fed creeks with moderate to swift currents.
Southern Cavefish *Typhlichthys subterraneus*	S3, SP	--	Unlikely	Aquatic cave obligate; cave streams, karst waters, and water supply wells.
Spring Pygmy Sunfish *Elassoma alabamae*	S1, SP	FT	Unlikely	Spring pools and spring runs, typically in calm, clear water with abundant aquatic vegetation.
Stripetail darter *Etheostoma kennicotti*	S3	--	Likely	Rocky pools of creeks and small rivers.
Tuscumbia darter *Etheostoma tuscumbia*	S2, SP	UR	Likely	Ponded spring-fed habitats of valley floor springs.
Crustaceans				
Alabama Cave Crayfish *Cambarus jonesi*	S2	--	Unlikely	Underground cave systems in the Tennessee River Basin.
White Spring Cave Crayfish *Cambarus veitchorum*	S1	--	Unlikely	Cave-dwelling species known only from the White Spring Cave.
Mollusks				
Alabama moccasinshell *Medionidus acutissimus*	S2	--	Likely	Small-medium sized rivers, in shallow areas with current and substrates of fine gravel, sand, & silt; occurs in the Mobile Basin and Gulf Coast drainage.
Alabama rainbow *Villosa nebulosa*	S3	--	Likely	Creeks to medium-sized rivers in sand/gravel riffles with moderate current; occurs in the Mobile Basin upstream of the Fall Line.
Dromedary Pearlymussel *Dromus dromas*	SX, SP	FE, EXPN	Unlikely	Medium-large rivers with riffles and shoals w/ relatively firm rubble, gravel, and stable substrates; endemic to Cumberlandian Region.

Common Name ***Scientific Name***	**State Rank and Listing Status[1]**	**Federal Listing Status[2]**	**Likelihood of Occurrence[3]**	**Habitat Description**
Hickorynut *Obovaria olivaria*	SX, PSM	--	Unlikely	Large rivers and lakes in sand or sand/gravel substrates; historically occurred in Tennessee River upstream to Muscle shoals, currently extirpated.
Kidneyshell *Ptychobranchus fasciolaris*	S2, PSM	--	Likely	High water quality creeks, rivers, and lakes with moderate to swift currents and sand or gravel substrates; occurs in Tennessee River system.
Lilliput *Toxolasma parvum*	S3, PSM	--	Unlikely	Quiet waters of low-gradient streams, river, and reservoirs, often in muddy bottoms; Tennessee River system, Mobile Basin, and Gulf Coast drainages.
Longsolid *Fusconaia subrotunda*	--	FT	Likely	Inhabits streams and small rivers with sand and gravel substrate.
Mucket *Actinonaias ligamentina*	S2, PSM	--	Unlikely	Medium to large rivers over coarse sand and gravel substrate; restricted to Tennessee River drainage.
Ohio Pigtoe *Pleurobema cordatum*	S2, PSM	--	Unlikely	Medium to large rivers with moderate flow and sand or gravel substrate but may also tolerate some reservoir environments.
Orangeacre Mucket *Hamiota perovalis*	S2	--	Unlikely	Stable sand, gravel, and cobble substrates with moderate to swift current in large streams and small rivers; endemic to western Mobile Basin.
Orangefoot Pimpleback *Plethobasus cooperianus*	SX, SP	FE, EXPN	Unlikely	Perennial streams with rocky areas and swift to slow moving currents; historically in Tennessee River Basin, currently extirpated.
Painted Creekshell *Villosa taeniata*	S2, PSM	--	Unlikely	Found in substrates of mixed sand and gravel with good current in less than three feet of water in rivers of all sizes; endemic to Cumberlandian Region.
Pink Mucket *Lampsilis abrupta*	S1, SP	FE	Unlikely	Large rivers with sand-gravel or rocky substrates with moderate to strong currents; restricted to Tennessee River system, specifically in tailwaters of Tennessee River dams and a short reach of Bear Creek in Colbert County.
Pink Papershell *Potamilus ohiensis*	S3, PSM	--	Unlikely	Large rivers with mud, sand, or silt bottoms in Mississippi drainage.
Pocketbook *Lampsilis ovata*	S2, PSM	--	Likely	Large creeks or small rivers with strong currents, with shoals and pools and occasionally in riffles; endemic to Tennessee River drainage.
Purple lilliput *Toxolasma lividum*	S2	--	Likely	Small-medium sized rivers & lg creeks, in mud, sand, & gravel substrates; restricted to Tennessee River drainage.
Ring Pink	SH, SP	FE, EXPN	Unlikely	Large rivers in sand and gravel; restricted to Tennessee River system.

Common Name ***Scientific Name***	**State Rank and Listing Status[1]**	**Federal Listing Status[2]**	**Likelihood of Occurrence[3]**	**Habitat Description**
Obovaria retusa				
Rough Pigtoe *Pleurobema plenum*	S1, SP	FE, EXPN	Unlikely	Medium to large rivers, in substrates ranging from mud and sand to gravel, cobble, and boulders;
Sheepnose Mussel *Plethobasus cyphyus*	S1, SP	FE	Unlikely	Large to medium-sized rivers, in riffles and coarse sand/gravel substrate.
Skirted hornsnail *Pleurocera pyrenella*	S2	--	Likely	Creeks and mediums rivers that are tributaries of the Tennessee River in north-central Alabama.
Slender campeloma *Campeloma decampi*	S1, SP	FE	Likely	Burrows in soft sediment, detritus, and sometimes in gravel substrates anywhere from the margins to midstream.
Slowwater Elimia *Elimia interveniens*	S2	--	Unlikely	Inhabits rocks, sandy, and muddy substrate in lakes, ponds, and rivers.
Spectaclecase *Cumberlandia monodonta*	S1, SP	FE	Unlikely	Medium to large rivers; in substrates ranging from mud and sand to gravel, cobble, and boulders.
Spiral hornsnail *Pleurocera brumbyi*	S2S3	--	Likely	Creeks and medium rivers that are tributaries of the Tennessee River in northern Alabama.
Tennessee pigtoe *Pleuronaia barnesiana*	S1, PSM	UR	Likely	Small tributary streams to large creeks with sandy gravel substrate; Endemic to Cumberlandian Region across northern Alabama.
Triangular kidneyshell *Ptychobranchus greenii*	S1	--	Likely	Shoal habitats in small creeks to large rivers, usually in sand and gravel substrates; Endemic to Mobile Basin upstream of Fall Line.
Tuberculed blossom (pearlymussel) *Epioblasma torulosa*	SX, SP	FE	Likely	Riffles or shoals in shallow waters of medium rivers or creeks with sandy gravel substrate and rapid currents; historically found across northern Alabama in Tennessee River.
Warrier Pigtoe *Pleurobema rubellum*	S1	--	Unlikely	Found in highly oxygenated, clear streams with moderate flow over sand and gravel substrate; limited to the tributaries of the Sipsey Fork, Winston County, and the North River in Tuscaloosa and Fayette Counties and its tributary Clear Creek, Fayette County, all in Alabama
White heelsplitter *Lasmigona complanata*	S2, PSM	--	Likely	Slower waters of medium streams and rivers, and occasionally in small tributaries; Tennessee River system.
Roud-rib elimia[5] *Elimia nassula*	S1	UR	Likely	Inhabits springs and spring-run habitats, utilizing a variety of substrates including sandy spring bottoms, aquatic vegetation, tree roots, and other hard substrates.

Insects and Arachnids				
Caddisfly *Agapetus hessi*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Cheumatopsyche kinlockensis*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Dolophilodes major*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Hydroptila coweetensis*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax atlanta*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax concinnus*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax ornatus*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Neophylax securis*	S1S2	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Orthotrichia baldufi*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Platycentropus radiatus*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Rhyacophila carolae*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Caddisfly *Rhyacophila minor*	S1	--	Likely	Aquatic larvae inhabiting aquatic habitats with medium- to fast-moving water.
Cave Obligate Beetle *Batriasymmodes spelaeus*	S3	--	Unlikely	Caves and subterrestrial habitats in Alabama and Tennessee.
Monarch butterfly *Danaus plexippus*	--	PT	Likely	Milkweed and nectar producing flowering plants.
Pseudoscorpion *Trisetobisium fallax*	S3	--	Likely	Moss, leaf litter, and under stones, logs, or bark.

Sources: AUMNH 2022; TVA 2023b; USFWS 2023a

[1] SP = State Protected; S1 = Extremely rare and critically imperiled in the state with five or fewer occurrences, or very few individuals, or because of some special condition where the species is particularly vulnerable to extinction; S2 = Very rare and imperiled in the state, 6–20 occurrences, or few remaining individuals, or because of some factor(s) making the species vulnerable to extinction; S3 = Rare and uncommon in the state, 21–100 occurrences; SX = Presumed Extirpated; PSM = Partial Status Mussels: all mussels species not listed as protected species under the Invertebrate Species Regulation are partially protected by other regulations of the Alabama Game, Fish, and Fur Bearing Animals Regulations.

[2] FE = Federally Endangered; FT = Federally Threatened; FPE = Federally Proposed as Endangered; FC = Federal Candidate for Listing; DL = Delisted; UR = under review for federal listing, EXPN = Experimental Population.

[3] Known = The species has been documented in the Project Site or vicinity by a reliable observer; Likely = The Project Site or vicinity is within the species' currently known range, and vegetation communities, soils, etc. resemble those known to be used and/or inhabited by the species; Unlikely = The Project Site or vicinity is within the species' currently known range, but vegetation communities, soils, etc. do not resemble those known to be used by the species, or the Project Site is clearly outside the species' currently known range.

[4] Previously observed on the Project Site.

[5] While not included in the RNHD, IPaC, or ALNHP lists; TVA biologists identified the round-rib elimia in Wheeler Branch during the fall of 2023 and spring of 2024 aquatic life surveys.

3.2.3.1 MAMMALS

The eastern spotted skunk is state-ranked as imperiled (S2) and rare (S3) in Alabama. This species typically inhabits a wide variety of habitats inclusive of forested areas with significant cover, open and bushy areas, and rocky canyons and outcrops in woodlands and prairies (NatureServe 2023). Habitat for this species was identified within the Project Site.

Three federally protected mammals were listed with potential to occur on the Project Site according to the IPaC list including the northern long-eared bat (NLEB), gray bat, and Indiana bat. Three additional bat species, the tricolored bat, proposed for federal listing; the little brown bat, under review for potential listing; and Rafinesque's big-eared bat, state-listed; could also occur. Foraging habitat for the listed bat species is present in the Study Area over wetlands, open cattle pastures, open waters and ponds, streams, within forested habitat, forest edges, and tree lines. Water resources for the include open waters/ponds primarily fed by rainwater and stream channels located on the site. The results of mist net and summer roost habitat surveys for the listed bats are described below.

3.2.3.1.1 Mist Net Survey Results

Mist net surveys were conducted by Biotope in August 2023 following the USFWS 2023 *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines* (Biotope 2023; USFWS 2023c) to assess the occurrence of listed bats on the Study Area. Surveys were conducted at eight sites with five mist-nets for two calendar nights, totaling ten mist-net nights per site. One linear site was surveyed with two mist-nets for two calendar nights, totaling four mist-net nights. Mist-nets were established along primary corridors, interior forest, across streams, and on the forest edges to maximize bat captures.

A total of 41 individual bats consisting of five species were captured. This included one lactating female adult tricolored bat and two adult gray bats, including one scrotal male and one non-reproductive female. No Indiana bats, NLEB, Rafinesque's big-eared bat, or little brown bats were captured. Other species of bat captured during the survey were the big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), and evening bat (*Nycticeius humeralis*). The female tricolored bat was tracked for seven consecutive days. During this period, three roosting trees were identified within the Study Area, however, one of the roosting trees was downed by a severe storm leaving only two viable roosting trees in the Study Area (Appendix A, Figure 4, page 4). The mist-net survey report is included in Appendix E.

3.2.3.1.2 Potential Summer Bat Roosting Habitat Assessment

HDR and Biotope conducted bat habitat surveys for the presence of live trees that exhibit exfoliating bark and dead trees (snags) with cracks or crevices that could serve as suitable roosting habitat in the Study Area for the NLEB, Indiana bat, tricolored bat, Rafinesque's big-eared bat, or little brown bat. Forested stands were categorized as providing either low, moderate or high-quality habitat based on the presence of trees with peeling/exfoliating bark, suitable snags, distance from water source, and connection to other stands (per TVA 2023 Guidelines). While most bat habitat is found in forested areas in the Study Area, some bat habitat was identified across surface waters and in herbaceous vegetation communities. High quality habitat contains mature forest with several trees that have a DBH of >15 inches, is near waterways, and has low density understory. Moderate quality habitat contains several suitable roosting trees that have a DBH of 3-15 inches and a denser understory. Low quality habitat contains younger trees that have grown close together (TVA 2023a). The buildings and culverts were inspected for bat habitat, but none were deemed as suitable habitat due to active human use and frequent water flow, respectively. Three culverts were observed within the TL Upgrade Areas; however, the culverts were less than 3 feet in diameter and did not require visual inspection (TVA 2023a). Photos were taken to visually document the assessment areas (**Appendix B**). The boundaries of potentially suitable habitat were mapped using a combination of aerial photography, GIS, and sub-meter GPS field mapping.

Gray bats almost exclusively roost in large caves throughout the year but can travel up to 50 miles per night to forage over open fields, forested areas, and open water areas such as streams, wetlands, and rivers (USFWS 2023b). They are sometimes found roosting in mines or buildings (NatureServe 2023). There are no known caves, "defined as any natural cavity with a horizonal length of 50 feet, total vertical extent of 40 feet or a pit depth of 30 feet," on or within 3 miles of the Project Site or TL Upgrade Areas. As such, the Project Site may provide suitable foraging habitat for gray bats. During the summer, the NLEB, Indiana bat, tricolored bat, Rafinesque's big-eared bat, and little brown bat roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees of varying size, age, and species (USFWS 2006, 2015a). The NLEB prefers winter habitats that include caves, rock crevices, and mines (TWRA 2022; USFWS 2015b); however, none were identified onsite. Other potential habitat includes older buildings such as collapsed barns.

A total of twenty-two forest stands totaling approximately 749 acres on the Project Site (**Appendix A**, Figure 4) were determined to provide potential summer roosting and/or foraging habitat for the NLEB, gray bat, Indiana bat, tricolored bat, Rafinesque's big-eared bat, and little brown bat (Table 5). Of the 749 forested acres, approximately 225 acres (30 percent) was assessed as providing high-quality habitat, approximately 189 acres (25 percent) provide moderate-quality habitat, and 334 acres (45 percent) provide low-quality habitat.

Two wooden farm structures on the Project Site provide potential roosting habitat for the gray bat, NLEB, Indiana bat, tricolored bat, Rafinesque's big-eared bat, and little brown bat. Signs of bat use (e.g., guano) within these structures were not observed at the time of survey. Photos of potential bat roosting habitat are included in Appendix B and bat habitat data forms are included in Appendix F.

Table 6. Summary of Forest Stands Providing Potential Bat Roosting and/or Foraging Habitat within the Hillsboro Solar Project Site

Stand Number	Habitat Suitability	Area (acres)
Forest Stand 1	High Quality	35.3
Forest Stand 2	Moderate Quality	39.8
Forest Stand 3	Moderate Quality	87.7
Forest Stand 4	Low Quality	38.3
Forest Stand 5	Low Quality	60.8
Forest Stand 6	Low Quality	22.2
Forest Stand 7	Low Quality	3.4
Forest Stand 8	Low Quality	15.1
Forest Stand 9	Low Quality	9.1
Forest Stand 10	High Quality	103.2
Forest Stand 11	Low Quality	2.9
Forest Stand 12	Low Quality	2.7
Forest Stand 13	Low Quality	45.6
Forest Stand 14	Low Quality	14.2
Forest Stand 15	High Quality	86.8
Forest Stand 16	Moderate Quality	40.2
Forest Stand 17	Low Quality	94.2
Forest Stand 18	Low Quality	14.1
Forest Stand 19	Low Quality	4.6
Forest Stand 20	Moderate Quality	21.7
Forest Stand 21	Low Quality	4.1
Forest Stand 22	Low Quality	2.7
	Total Area	**748.7**

3.2.3.1.2.1 Stand 1

Stand 1 consists of mixed deciduous forest surrounded by agricultural fields used for soybean production, located along the southern portion of the Project Site. Dominant canopy and understory trees include willow oak, white oak, post oak, shagbark hickory (*Carya ovata*), red maple, green ash, and sweet gum. Trees ranged in size from 3 to greater than 40 inches DBH. Three snags were identified within this stand as well as over 15 shagbark hickory trees with peeling bark. Stand 1 exhibited moderate tree species diversity and a relatively open understory. Stand 1 includes one large, forested wetland (W012) totaling approximately 29 acres was identified as providing a suitable water source within the stand. Stand 1 lacks connection to any larger forested stands within the Project Site. Stand 1 was categorized as having high quality bat roosting and foraging habitat.

3.2.3.1.2.2 Stand 2

Stand 2 consists of mixed deciduous forest surrounded by agricultural soybean fields located along the centrally within the Project Site. Dominant canopy and understory trees include willow oak, southern red oak, bur oak, shagbark hickory, green ash, sweet gum, black gum, and eastern red cedar. Trees ranged in size from 3 to greater than 40 inches DBH. Two snags were identified within Stand 2 as well as several shagbark hickories with peeling bark. Stand 2 exhibited moderate tree species diversity and a relatively open understory and contains a large, forested wetland (W017) totaling approximately 27 acres and a stream provide suitable water sources. Stand 2 lacks connection to any larger forested stands within the Project Site. Stand 2 was categorized as having moderate quality bat roosting and foraging habitat.

3.2.3.1.2.3 Stand 3

Stand 3 consists of mixed deciduous forest surrounded by roads and agricultural fields used for cotton production, located within the southeastern portion of the Project Site. Dominant canopy and understory trees include water oak, willow oak, shagbark hickory, sweet gum, and green ash. Trees ranged in size from 10 to 35 inches DBH. Eight suitable snags were identified within Stand 3 as well as several trees with peeling bark. Stand 3 exhibited moderate tree species diversity and relatively open understory but lacks a connection to a larger forested stand. One large, forested wetland (W020) totaling approximately 61 acres was identified within the stand as providing a suitable water source. Stand 3 was categorized as having moderate quality bat roosting and foraging habitat.

3.2.3.1.2.4 Stand 4

Stand 4 consists of evergreen forest surrounded by a mixed deciduous stand and a cotton field, located in the southeastern portion of the Project Site. Dominant canopy and understory trees include loblolly pine with few sweet gum, water tupelo, and eastern red cedar. Overall, tree species diversity in Stand 4 was characterized as low and the understory was relatively thick. Trees ranged in size from 3 to 25 inches DBH. No snags and few trees with exfoliating bark were identified within this stand. Stand 4 has a connection to Stand 5 within the Project Site. One large, forested wetland (W024) totaling approximately 70 acres in Stand 4 provides a suitable water source. Stand 4 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.5 Stand 5

Stand 5 consists of mixed deciduous bottomland forest surrounded by cotton fields, located within the southeastern portion of the Project Stand. Dominant canopy and understory trees include willow oak, swamp tupelo, sweet gum, post oak, and eastern red cedar. Overall, tree species diversity in Stand 5 was characterized as moderate and the understory was relatively thick. Trees ranged in size from 3 to 25 inches DBH. No snags and few trees with exfoliating bark were identified within this stand. Stand 5 is connected to Stand 4 within the Project Site. One large, forested wetland (W024) totaling approximately 70 acres was identified within the stand as providing a suitable water source. Stand 5 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.6 Stand 6

Stand 6 consists of a forested fence line adjacent to a cotton field, located within the southeastern portion of the Project Site. Dominant and understory trees include loblolly pine, black gum, sweet gum, American sycamore, willow oak, and bur oak. Trees ranged in size from 10 to 40 inches DBH. No snags were identified within this stand and the understory was considered relatively thick. Stand 6 lacks connection to any larger forested stands within the Project Site and was characterized as having moderate diversity. Three small wetlands (W031, W032, and W033) totaling approximately nine acres were identified within the stand as providing a suitable water source. Stand 6 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.7 Stand 7

Stand 7 consists of a small (3.4-acre), wooded area surrounded by cotton fields, located within the southeastern portion of the Project Site. Dominant and understory trees include common hackberry, black cherry, sweet gum, and black walnut. Trees ranged in size from 10 to 25 inches DBH. No snags and few trees with exfoliating bark were identified within this stand. Stand 7 lacks connection to any larger forested stands within the Project Site and was characterized as having low tree species diversity. No suitable water sources were identified in Stand 7. Stand 7 was categorized as having low quality bat roosting and foraging.

3.2.3.1.2.8 Stand 8

Stand 8 consists of a small, wooded area surrounded by cotton fields, located within the southeastern portion of the Project Site. Dominant canopy and understory trees include hackberry, black gum, black willow, and black walnut. Trees ranged in size from 10 to 25 inches DBH. No snags and few trees with exfoliating bark were identified within this stand. Stand 8 lacks connection to any larger forested stands within the Project Site and was characterized as having low tree species diversity. One forested wetland (W030b) totaling approximately 12 acres within the stand provides a suitable water source. Stand 8 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.9 Stand 9

Stand 9 consists of a small, wooded area surrounded by cotton fields, located within the southeastern portion of the Project Site. Dominant canopy and understory trees include hackberry, sweet gum, and black walnut. Trees ranged in size from 10 to 30 inches DBH. No snags and few trees with exfoliating bark were identified within this stand. Stand 9 lacks connection to any larger forested stands within the Project Site and was characterized as having low tree species diversity. One small, forested wetland (W029) totaling approximately two acres was identified within the stand as providing a suitable water source. Stand 9 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.10 Stand 10

Stand 10 consists of a moderately sized deciduous forest surrounded by cotton fields in the southeastern portion of the Project Site. Dominant canopy and understory trees include loblolly pine, sugar maple, water oak, sweet gum, bur oak, turkey oak, southern red oak, post oak, and shagbark hickory. Overall, tree species diversity within the stand was characterized as high. Trees ranged in size from 5 to 50 inches DBH. Eight snags and 15 trees with exfoliating bark were identified within this stand. Stand 10 lacks connection to any larger forested stands within the Project Site. Two small, forested wetlands (W028 and W022) totaling approximately three acres were identified within the stand as providing a suitable water source. Stand 10 was categorized as having high quality bat roosting and foraging habitat.

3.2.3.1.2.11 Stand 11

Stand 11 consists of a small, wooded area surrounded by corn fields, located within the southeastern portion of the Project Site. Dominant canopy and understory trees include basswood, black cherry, post oak, bur oak, and privet. Trees ranged in size from 3 to 40 inches DBH. No snags and few trees with exfoliating bark were identified within this stand. Stand 11 lacks connection to any larger forested stands within the Project Site and overall tree species diversity was characterized as moderate. No suitable water sources were identified within this stand. Stand 11 was categorized as having high quality bat roosting and foraging habitat.

3.2.3.1.2.12 Stand 12

Stand 12 consists of a small, wooded area surrounded by corn fields, located within the southeastern portion of the Project Site. Dominant canopy and understory trees loblolly pine, southern red oak, post oak, turkey oak, and sweet gum. Trees ranged in size from 5 to 40 inches DBH. No snags and few trees with exfoliating bark were identified within this stand. Stand 12 lacks connection to any larger forested stands within the Project Site and overall tree species diversity was characterized as moderate. No water sources were identified within this stand. Stand 12 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.13 Stand 13

Stand 13 consists of a small, wooded area along a fence line surrounded by corn fields, located within the southeastern portion Project Site. Dominant canopy and understory trees include bur oak, turkey oak, black gum, and eastern red cedar. Trees ranged in size from 11 to 40 inches DBH. One suitable snag but few trees were exfoliating bark were identified within this stand. Stand 13 lacks connection to any larger forested stands within the Project Site and overall tree species diversity was characterized as moderate. Two small, forested wetlands (W018 and W019) totaling approximately 14 acres were identified within the stand as providing a suitable water source. Stand 13 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.14 Stand 14

Stand 14 consists of a small, wooded area surrounded by corn fields, located within the southwestern portion of the Project Site. Dominant canopy and understory trees include sweet gum, black gum, sugar hackberry, willow oak, and water oak. Trees ranged in size from 10 to 30 inches DBH. No snags and trees were exfoliating bark were identified within this stand and Stand 14 lacks connection to any larger forested stands within the Project Site and overall tree species diversity was characterized as low. One forested wetland (W024) totaling approximately 70 acres was identified within the stand as providing a suitable water source. Stand 14 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.15 Stand 15

Stand 15 consists of deciduous forest surrounding by roads and agricultural fields, located within the northeastern portion of the Project Site. Dominant canopy and understory trees include shagbark hickory, water oak, post oak, red maple, eastern red cedar, white oak, and sweet gum. Trees ranged in size from 10 to 40 inches DBH. Six suitable snags and 20 trees with exfoliating bark were identified in this stand. Stand 15 lacks connection to any larger forested stands within the Project Site and overall tree diversity within the stand was characterized as moderate. Three forested wetlands (W013, W014, and W015) totaling approximately 46 acres and a large perennial stream (S008) were identified within the stand as providing a suitable water source. Stand 15 was categorized as having high quality bat roosting and foraging habitat.

3.2.3.1.2.16 Stand 16

Stand 16 consists of a small deciduous forest surrounded by agricultural fields, located within the northern portion of the Project Site. Dominant canopy and understory trees include willow oak, sweetgum, winged sumac, black oak, post oak, and black gum; however, this stand had an open understory. Trees ranged in size from 3 to 35 inches DBH. Four suitable snags and few trees with exfoliating bark were identified within this stand. Stand 16 lacks a connection to a larger forested stand within the Project Site and overall tree species diversity within the stand was characterized as moderate. One forested wetland (W008) totaling approximately 20 acres was identified within the stand as providing a suitable water source. Stand 16 was categorized as having moderate quality bat roosting and foraging habitat.

3.2.3.1.2.17 Stand 17

Stand 17 consists of deciduous forest surrounded by agricultural fields, located within the northern portion of the Project Site. Dominant canopy and understory trees include hackberry, American beech, turkey oak, and shagbark hickory. Trees ranged in size from 5 to 30 inches DBH. Three suitable snags but few trees with exfoliating bark were identified within this stand; however, Stand 17 lacks connection to any larger forested stands within the Project Site and overall tree species diversity within the stand was characterized as low. One small, forested wetland (W006) totaling approximately seven acres was identified within the stand as providing a suitable water source. Stand 17 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.18 Stand 18

Stand 18 consists of mixed forest surrounded by cotton fields, located within the northwestern portion of the Project Site. Dominant canopy and understory trees include willow oak, post oak, sweet gum, and eastern red cedar. Trees ranged in size from 3 to 30 inches DBH. No suitable snags or trees with exfoliating bark were identified within this stand. Stand 18 lacks connection to any larger forested stands within the Project Site and overall tree species diversity within the stand was characterized as low. One small, forested wetland (W001) totaling approximately one acre was identified within the stand as providing a suitable water source. Stand 18 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.19 Stand 19

Stand 19 consists of mixed forest surrounded by corn fields, located centrally to the Project Site. Dominant canopy and understory trees include loblolly pine, southern red oak, eastern red cedar, and post oak. Trees ranged in size from 10 to 45 inches DBH. No suitable snags and few trees with exfoliating bark were identified within this stand. Stand 19 lacks connection to any larger forested stands within the Project Site and overall tree species diversity within the stand was characterized as low. No water sources were identified within this stand. Stand 19 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.20 Stand 20
Stand 20 consists of mixed forest surrounded by soybean field, located in the northeast corner of the Project Site. Dominant canopy and understory trees include loblolly pine, southern red oak, eastern red cedar, sweet gum, sugar berry, mockernut hickory, and post oak. Trees ranged in size from 5 to 45 inches DBH. Three suitable snags and several trees with exfoliating bark were identified within this stand. Stand 20 has connection to a larger forested stand outside of the Project Site and overall tree species diversity within the stand was characterized as moderate. One forested wetland occurs as a water source for this stand. Based on these characteristics, Stand 20 was categorized as having moderate quality bat roosting and foraging habitat.

3.2.3.1.2.21 Stand 21
Stand 21 consists of a loblolly pine stand surrounded by soybean field, located in the northeastern corner of the Project Site. Dominant canopy and understory trees include loblolly pine, eastern red cedar, and Chinese privet. Trees ranged in size from 10 to 25 inches DBH. No suitable snags and few trees with exfoliating bark were identified within this stand. Stand 21 lacks connection to any larger forested stands within the Project Site and overall tree species diversity within the stand was characterized as low. No water sources were identified within this stand. Stand 21 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.1.2.22 Stand 22
Stand 22 consists of a loblolly pine stand surrounded by soybean field, located in the northeastern corner of the Project Site. Dominant canopy and understory trees include loblolly pine, eastern red cedar, and Chinese privet. Trees ranged in size from 10 to 25 inches DBH. No suitable snags and few trees with exfoliating bark were identified within this stand. Stand 22 lacks connection to any larger forested stands within the Project Site and overall tree species diversity within the stand was characterized as low. No water sources were identified within this stand. Stand 22 was categorized as having low quality bat roosting and foraging habitat.

3.2.3.2 REPTILES
The coal skink was the only reptile species with potential to occur on the Study Area. Coal skinks inhabit hilly sites with mixed hardwood pine forests and are typically encountered in mesic situations in rotting logs, under rocks, or in leaf litter, seldom far from streams (ADCNR 2023). Potential habitat for coal skink was identified on the Project Site in forested wetlands.

Suitable habitat for the alligator snaping turtle is not present on the Project Site or TL Upgrade Areas.

3.2.3.3 FISH
One federally threatened fish, one fish under federal review, and three state-ranked fish species were identified as likely to on the Study Area (Table 5). The slackwater darter is known from two disjunct populations in Alabama, including the Cypress Creek, upper Shoal Creek, and Flint River systems in northern Alabama and south-central Tennessee, and from the headwaters of the Buffalo River in Tennessee (ADCNR 2023). Slackwater darters are found in pool areas of small streams that contain organic debris throughout the year, and then migrate into adjacent flooded lowland areas with spring seepage to spawn. Potential habitat for this species was

identified in Wheeler Branch (S008), which is located in the central portion of the Project Site, however this species was not observed during aquatic life surveys.

The Tuscumbia darter is restricted to vegetated spring pools and runs with slow current and is usually associated with aquatic plants or algae over clean substrates of fine gravel, sand, and silt. This species resides in high-quality habitats in water that is generally clear, clean, and cool (50-57°F) (Etnier and Starnes 1993; Boschung and Mayden 2004; Page and Burr 2011). Potential habitat for this species was identified in Wheeler Branch during the August and October 2023 field surveys, and previous occurrences have been documented within the Project Site according to the TVA RNHD. Field surveys conducted in the fall of 2023 and spring of 2024 identified this species within Wheeler Branch. According to USFWS, this species has been petitioned for federal listing due to present or threatened destruction, modification, or curtailment of its habitat or range; inadequacy of existing regulatory mechanisms; and other natural or manmade factors. Existing populations are vulnerable to human alterations of spring heads.

The Bankhead darter typically inhabits rocky, flowing pools and runs of creeks and small rivers (NatureServe 2023). Bankhead darters usually occur in clear water over sand and fine gravel, generally in associated with leaf packs and/or wood debris but may occasionally occur over open bedrock. Potential habitat for this species on the Project Site was identified in Wheeler Branch, however this species was not observed during aquatic life surveys.

The range of the slender madtom is limited to the western half of the Tennessee River drainage (ADCNR 2023). Slender madtoms typically inhabit riffles in small or medium-sized streams with moderate to swift currents that flow over sand and gravel substrates. Although Wheeler Branch had slow to moderate currents at the time of the August and October 2023 field surveys, evidence of heavier currents were indicated by the presence of erosion and drift deposits; therefore, Wheeler Branch may provide suitable habitat for the slender madtom within the Project Site, however this species was not observed during aquatic life surveys.

The stripetail darter is most commonly found in the Paint Rock River system and less frequently throughout other streams in the Tennessee River Drainage (ADCNR 2023). This species inhabits small to moderately sized streams with shallow pools over slabrock substrate, which provides cover and serves as spawning sites. Potential habitat for this stripetail darter on the Project Site was identified in Wheeler Branch, however this species was not observed during aquatic life surveys.

3.2.3.4 MOLLUSKS

Table 5 lists 14 species of aquatic mollusks including four snails and ten species of mollusks likely to occur in the Study Area according to the resource lists. The spiraled hornsnail was previously reported within the Project Site according to the TVA RNHD. TVA biologists identified the round-rib elimia (*Elimia nassula*) in Wheeler Branch during the fall of 2023 and spring of 2024 aquatic life surveys. The round-rib elimia is a rare aquatic snail endemic to the Tennessee River system in northern Alabama where it typically inhabits springs and spring-run habitats, utilizing a variety of substrates including sandy spring bottoms, aquatic vegetation, tree roots, and other hard substrates. This species is of highest conservation concern in the state of Alabama and is under federal review for potential listing.

3.2.3.5 INSECTS AND ARACHNIDS

Monarch butterflies are currently classified as a federal candidate species for listing. They are milkweed specialists meaning that the larval phase of the species exclusively feeds on one of various milkweed species. Monarch butterflies prefer habitats that provide milkweed and other flowering plants for nectarine during the adult phase. These areas include roadsides, open areas such as fields, wet areas with flowering species, or urban gardens (NatureServe 2023). No milkweeds were present at the time of the August and October 2023 field survey and no monarch butterflies were observed in the Project Site. However, based on the large number of flowering plants occurring in the vicinity of the Project Site, there is potential periodically for the adult monarch butterfly to be present, and if milkweed is present, also for the larva.

Thirteen species of insects and/or arachnids with state ranks were identified as having potential to occur within the Project Site (Table 5). This includes twelve species of caddisfly and a pseudoscorpion (*Trisetobisium fallax*). Caddisflies are a large group of insects (i.e., over 1,500 species) with an aquatic larval stage (Auburn 2023). Caddisfly larvae are typically found in higher quality aquatic habitats with medium- to fast-moving water. In-stream surveys for aquatic benthic macrofauna were conducted as part of the fall 2023 and spring 2024 aquatic life surveys, and these species were not observed. However, suitable habitat potentially exists within the Project Site to support these species as several streams onsite contain gravel and sand substrates with moderately flowing water.

Pseudoscorpions are small, scorpion-like arachnids that inhabit a wide variety of environments. In forested environments, they may be found among moss and leaf litter, and under objects such as stones, logs, bark, and debris (NatureServe 2023). No pseudoscorpions were identified during the August 2023 and October field survey as the small size of these organisms often precludes observation; however, based on their general habitat requirements, the potential exists for this species to occur on the Project Site.

4 Results Summary

Approximately 74 percent of the Study Area is comprised of cropfields and most of the remainder is forested areas of varying sizes located mostly along the outer boundary of the Project Site and surrounding wetlands, streams, and open waters.

Suitable milkweed and nectar-producing habitats with full sun exposure and drained loamy soils are limited on the Project Site to existing roadside and few areas in the open cattle pastures. The Project Site likely would not support breeding populations of monarch butterflies but may be utilized for foraging during migrations. The Project could result in the temporary displacement of a few foraging monarch butterflies but is not expected to result in adverse effects on the species or the death of individuals. While land management techniques can improve habitat for the monarch butterfly, consultation with USFWS is not required as the species is currently listed as a candidate for protection under the ESA.

Forested areas and two buildings on the Project Site provide potential roosting and foraging bat habitat for four federally listed bat species as well as two other non-listed bat species. Removal of suitable summer roosting habitat may require consultation with USFWS under Section 7 of the ESA. To minimize impacts to bat species and prevent accidental takes, it is recommended to clear trees during the winter (October 14- April 1 for Indiana bats and August 15- May 14 for NLEBs, tricolored bats, and little brown bats) when bats would not be roosting in trees.

During the aquatic surveys, two state-listed aquatic species were identified: the round-rib elimia and the Tuscumbia darter. Both species are under federal review for listing.

Due to the variety of habitats present, including high quality forests and forested wetlands, the Study Area supports diverse plant and animal communities and populations. These include numerous migratory birds, including several of conservation concern due to declining populations in the region.

Because of TVA's proposed purchase of power generated by the Project, TVA would need to consult under Section 7 of the ESA with the U.S. Fish and Wildlife Service on the potential impacts to federally listed species.

The state of Alabama does not have a state law equivalent to the ESA so species do not receive regulatory protection as state-listed endangered or threatened species (Auburn 2022); however, Alabama defers to federal listing for threatened and endangered species. Additionally, some species receive protection through state regulations reviewed annually by the Alabama Department of Conservation and Natural Resources.

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A

Appendix A – Figures

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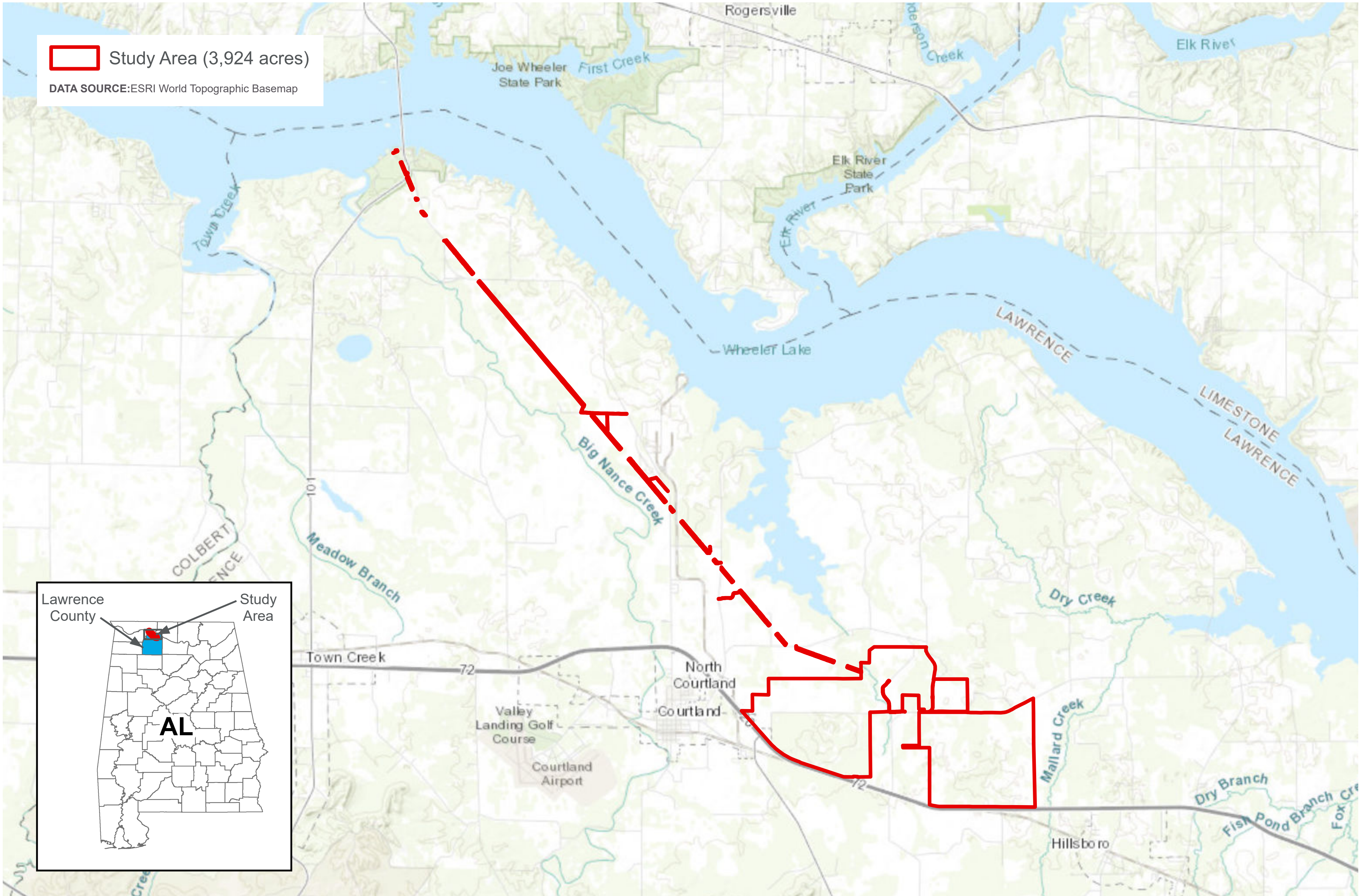

HILLSBORO SOLAR

PROJECT VICINITY

FIGURE 1

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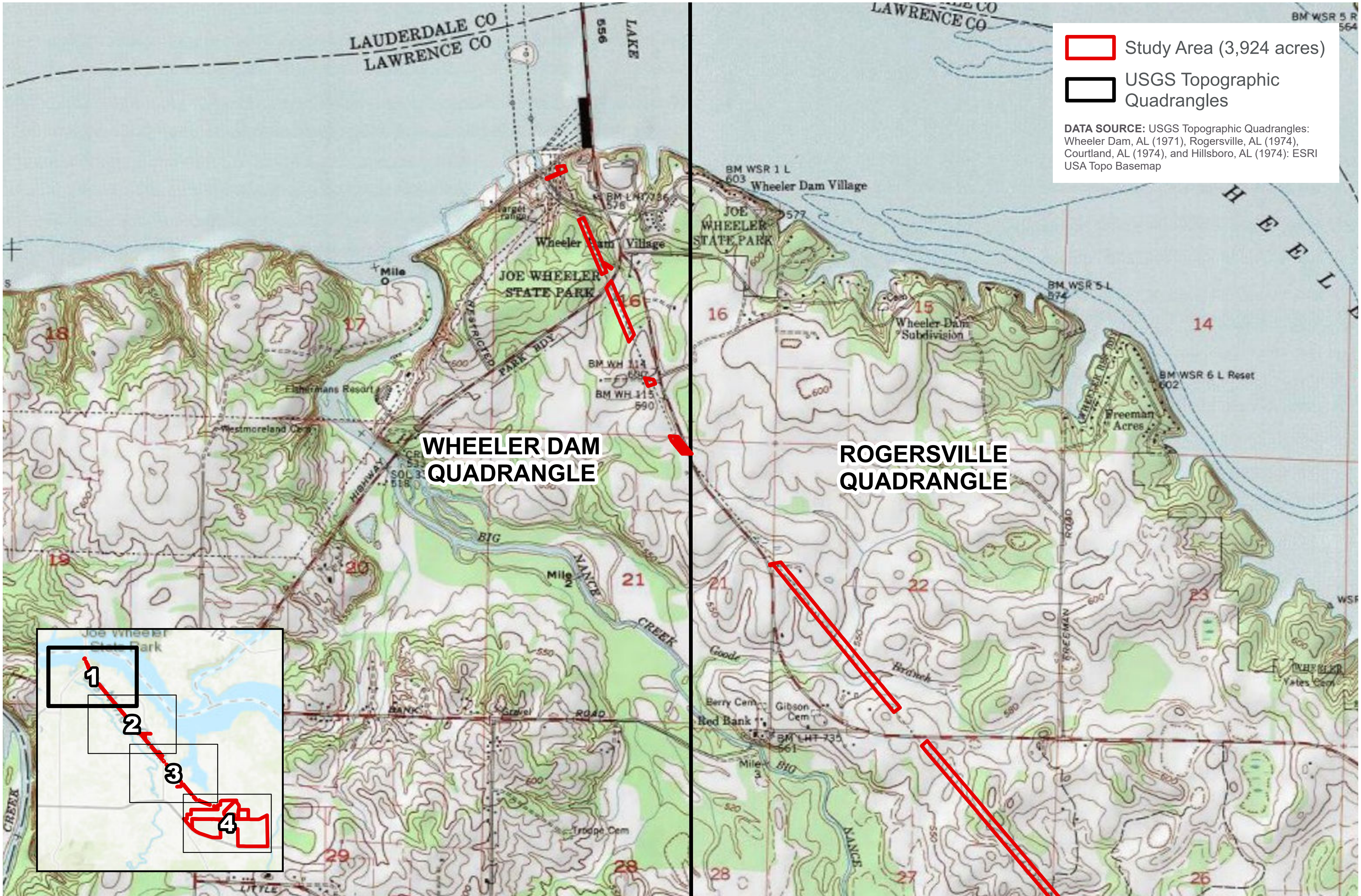


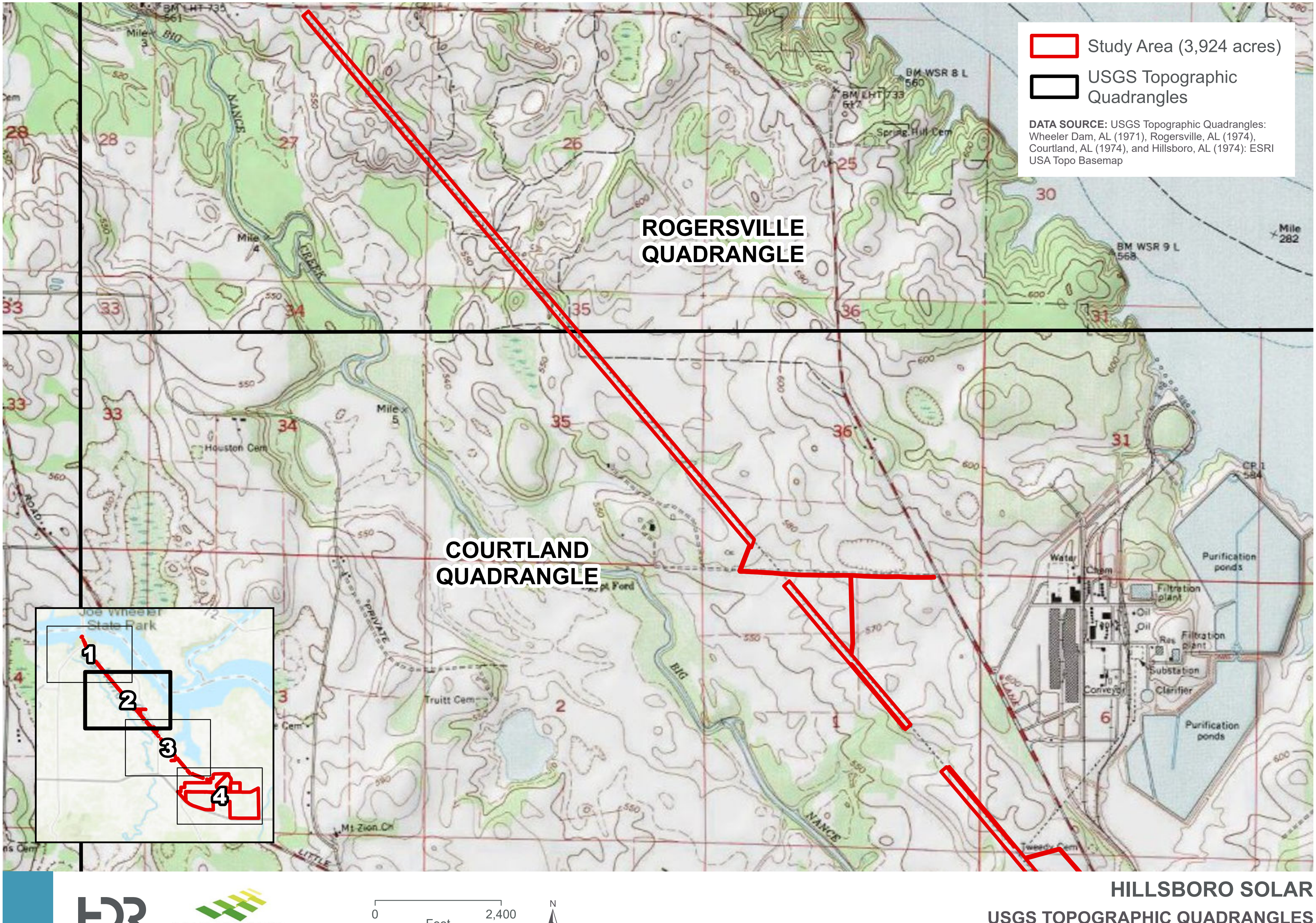
HDR

URBAN GRID

HILLSBORO SOLAR

USGS TOPOGRAPHIC QUADRANGLES

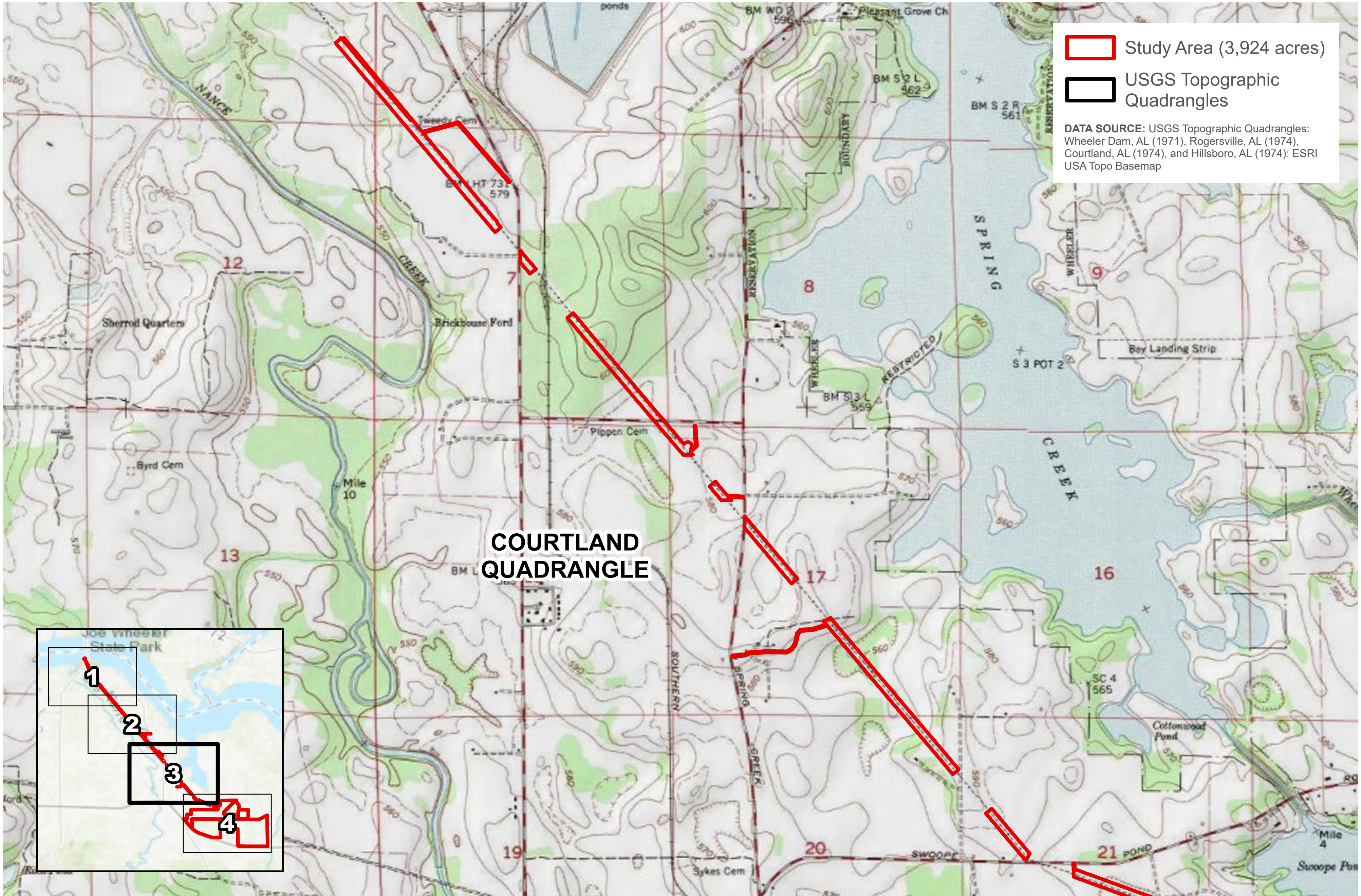
FIGURE 2 - PAGE 1 OF 4



HILLSBORO SOLAR

USGS TOPOGRAPHIC QUADRANGLES

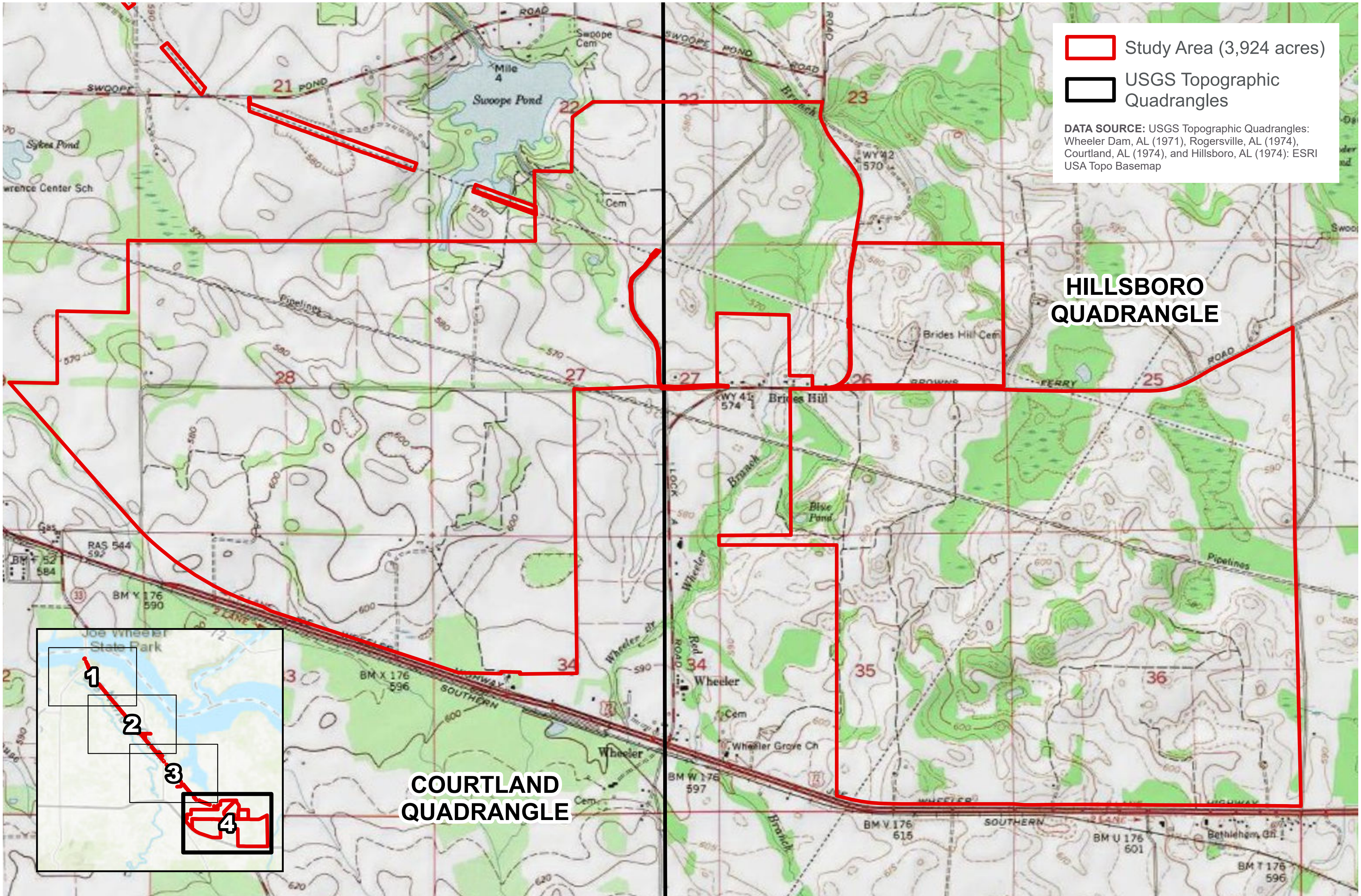
FIGURE 2 - PAGE 2 OF 4



HILLSBORO SOLAR

USGS TOPOGRAPHIC QUADRANGLES

FIGURE 2 - PAGE 3 OF 4

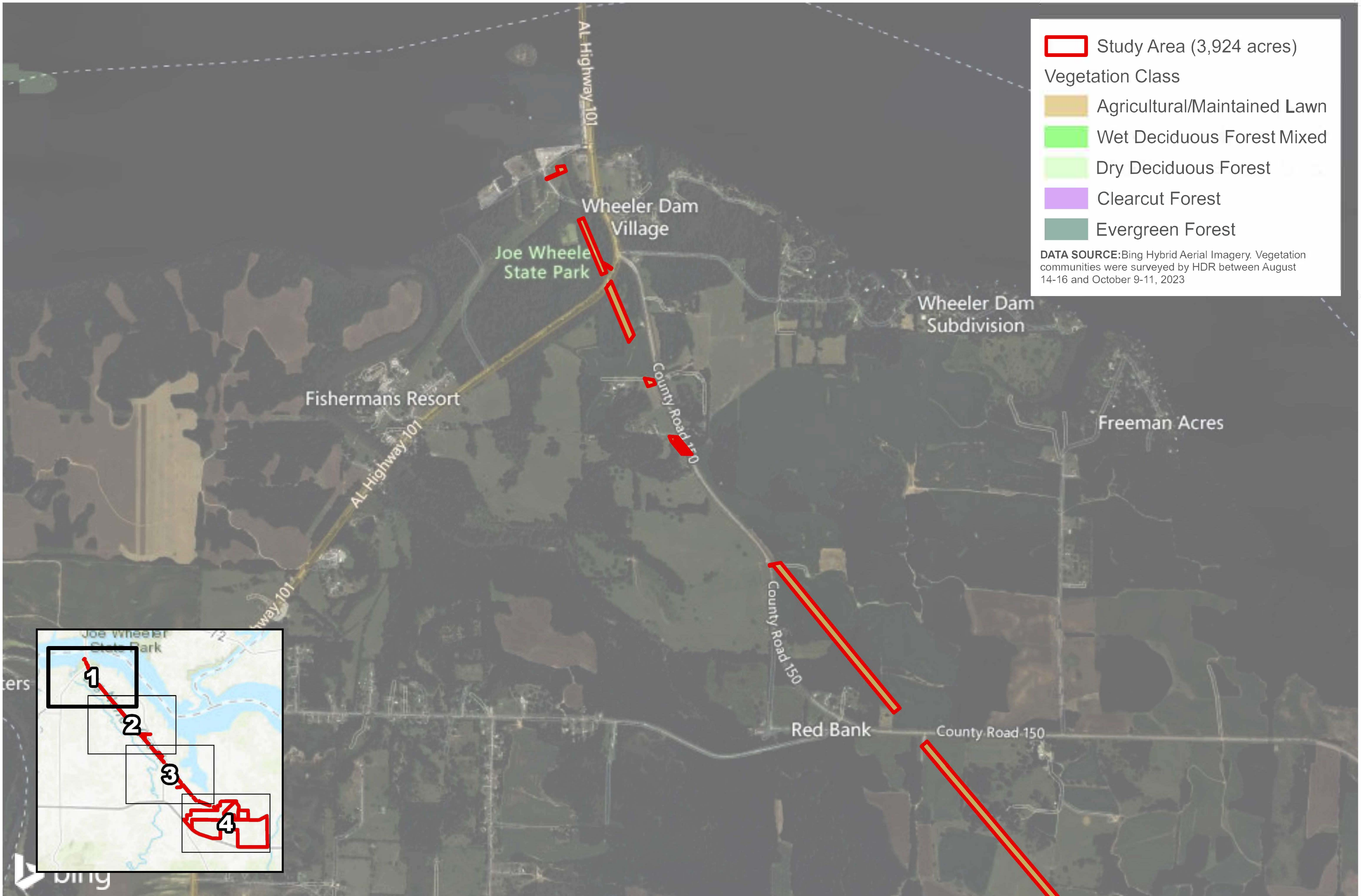


HDR
URBAN GRID

HILLSBORO SOLAR

USGS TOPOGRAPHIC QUADRANGLES

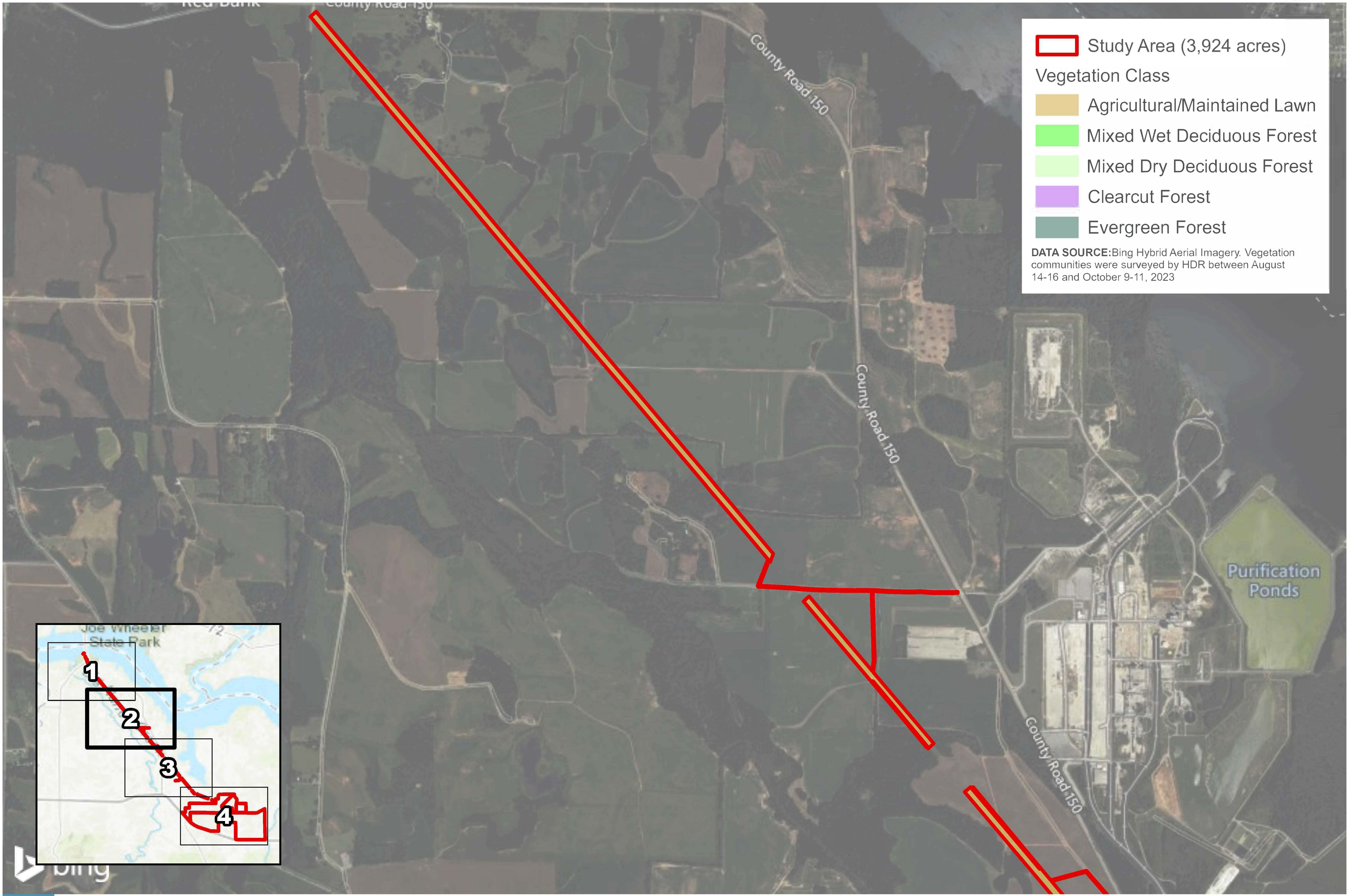
FIGURE 2 - PAGE 4 OF 4



HILLSBORO SOLAR

VEGETATION COMMUNITIES

FIGURE 3 - PAGE 1 OF 4



HDR

URBAN GRID

HILLSBORO SOLAR

VEGETATION COMMUNITIES

FIGURE 3 - PAGE 2 OF 4

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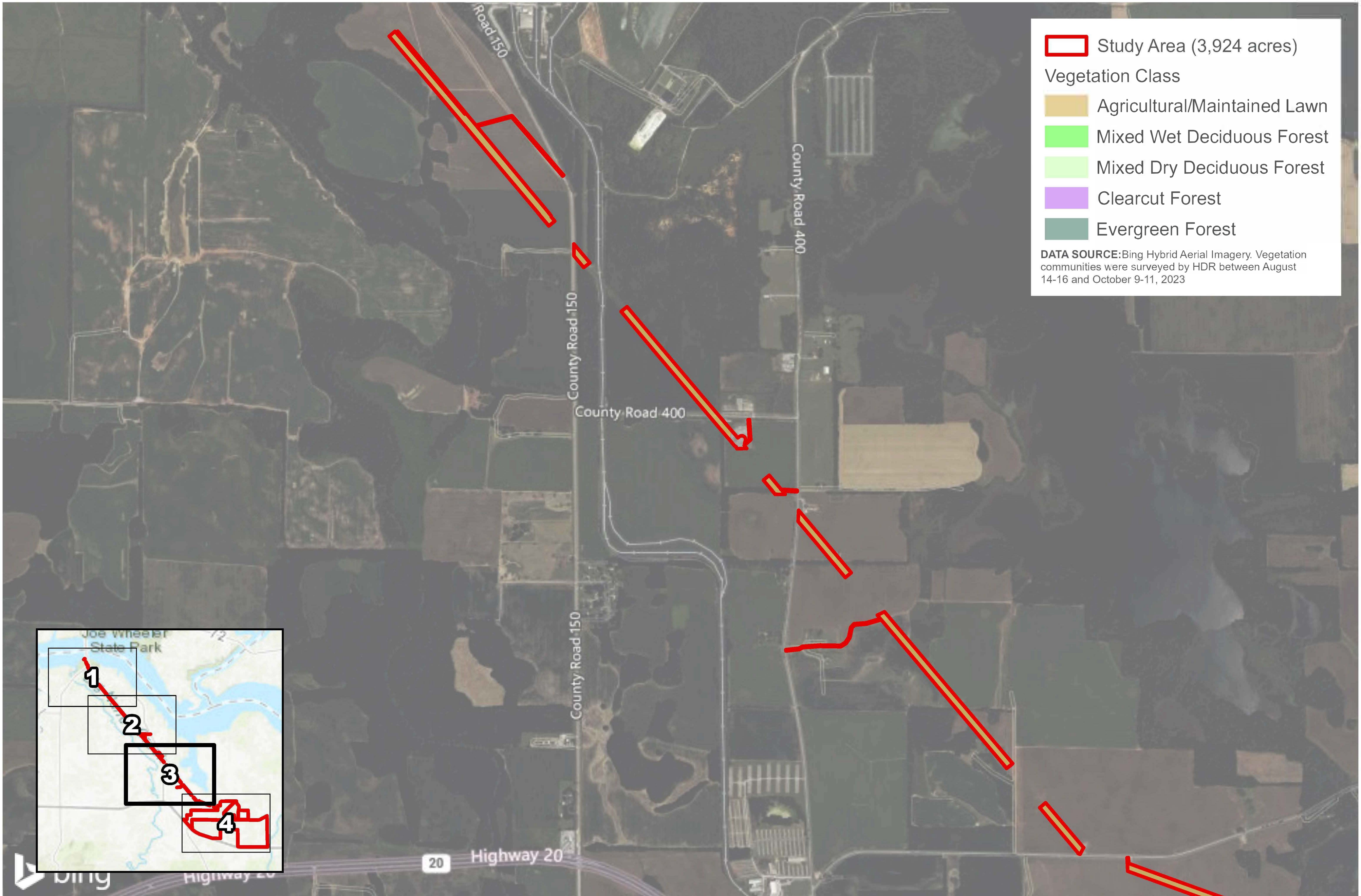

HILLSBORO SOLAR

VEGETATION COMMUNITIES

FIGURE 3 - PAGE 3 OF 4

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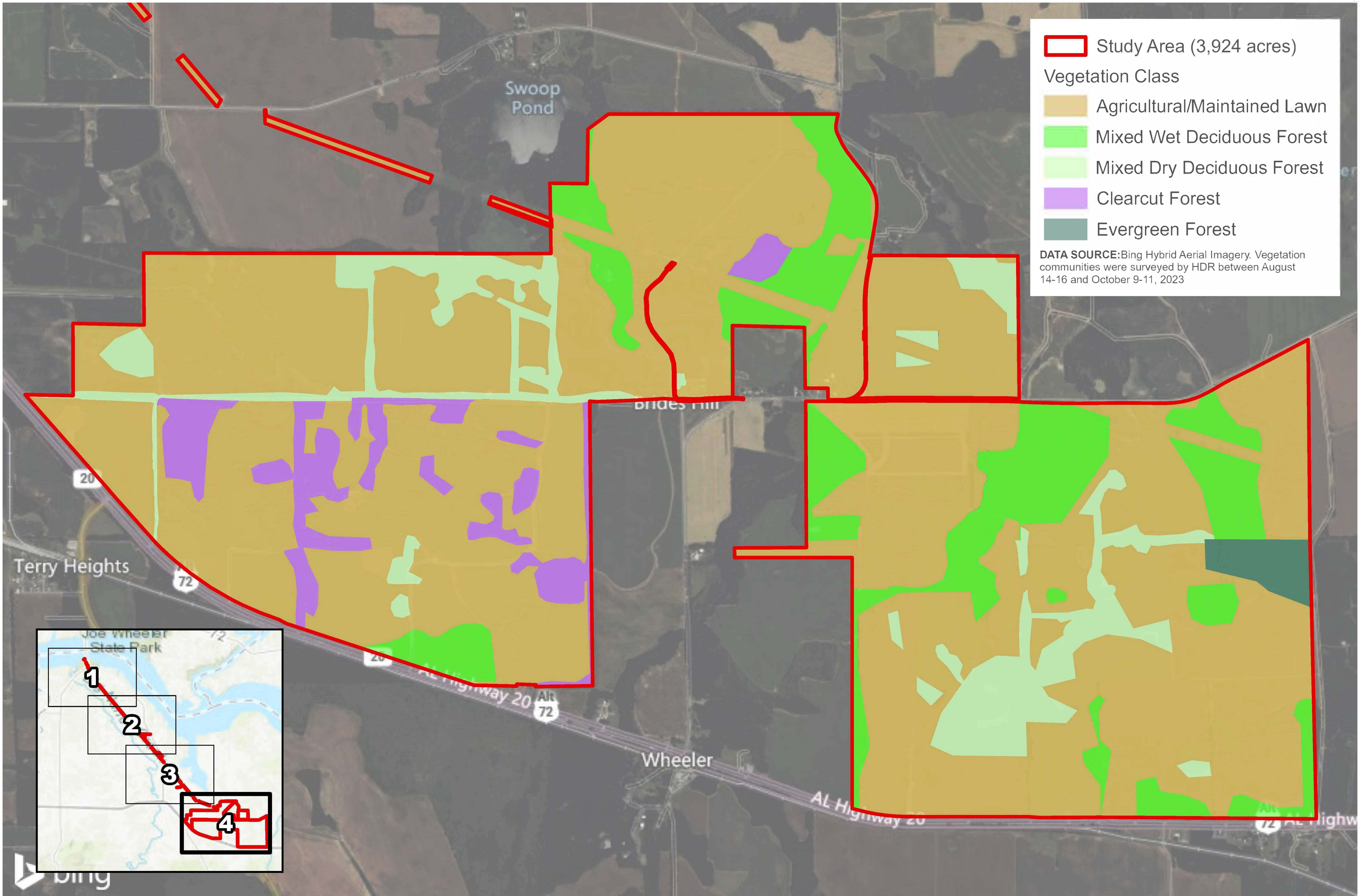

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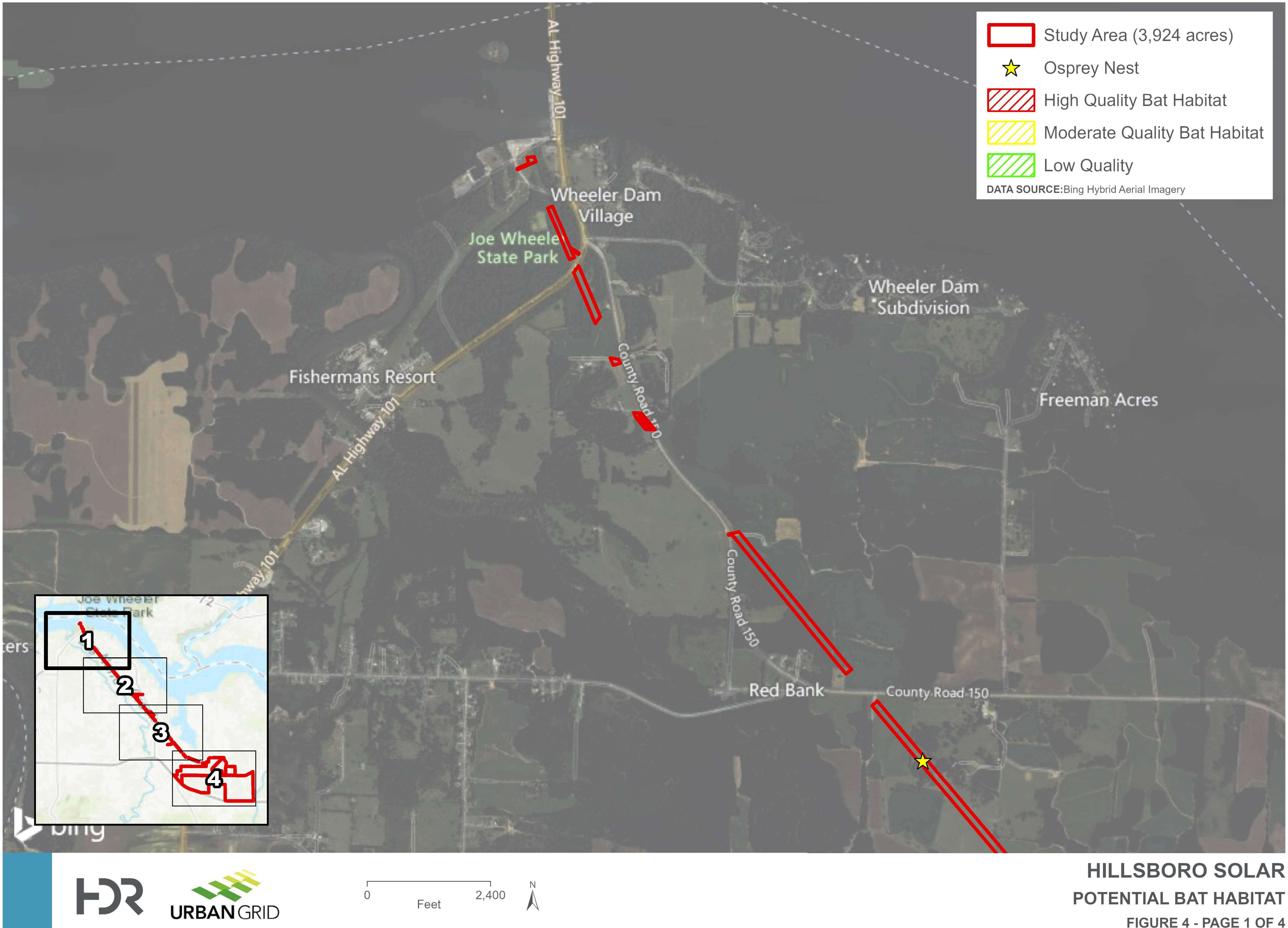
URBAN GRID

HILLSBORO SOLAR

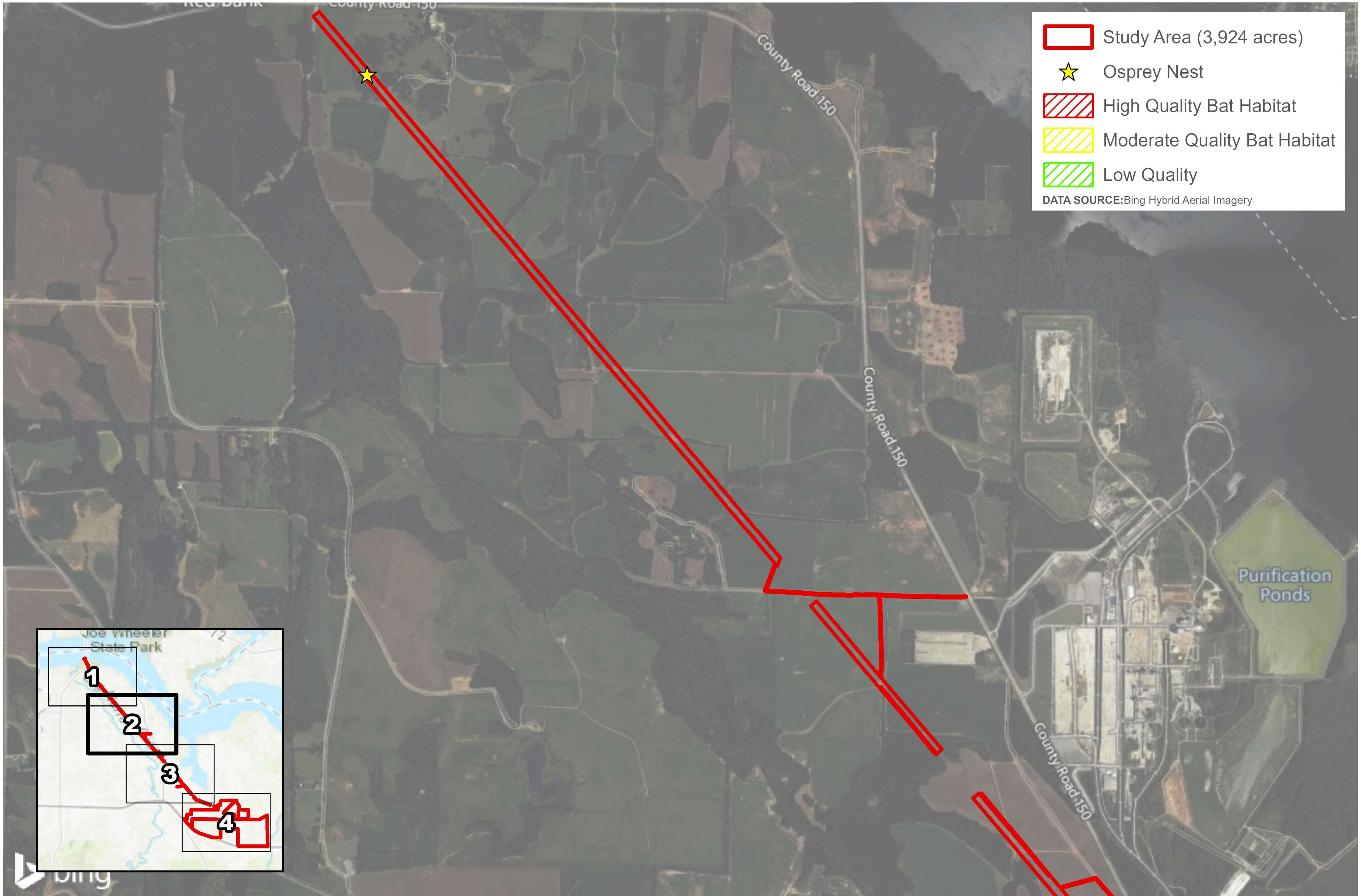
VEGETATION COMMUNITIES

FIGURE 3 - PAGE 4 OF 4



HDR URBAN GRID

HILLSBORO SOLAR
POTENTIAL BAT HABITAT
FIGURE 4 - PAGE 1 OF 4



HDR URBAN GRID

HILLSBORO SOLAR

POTENTIAL BAT HABITAT

FIGURE 4 - PAGE 2 OF 4

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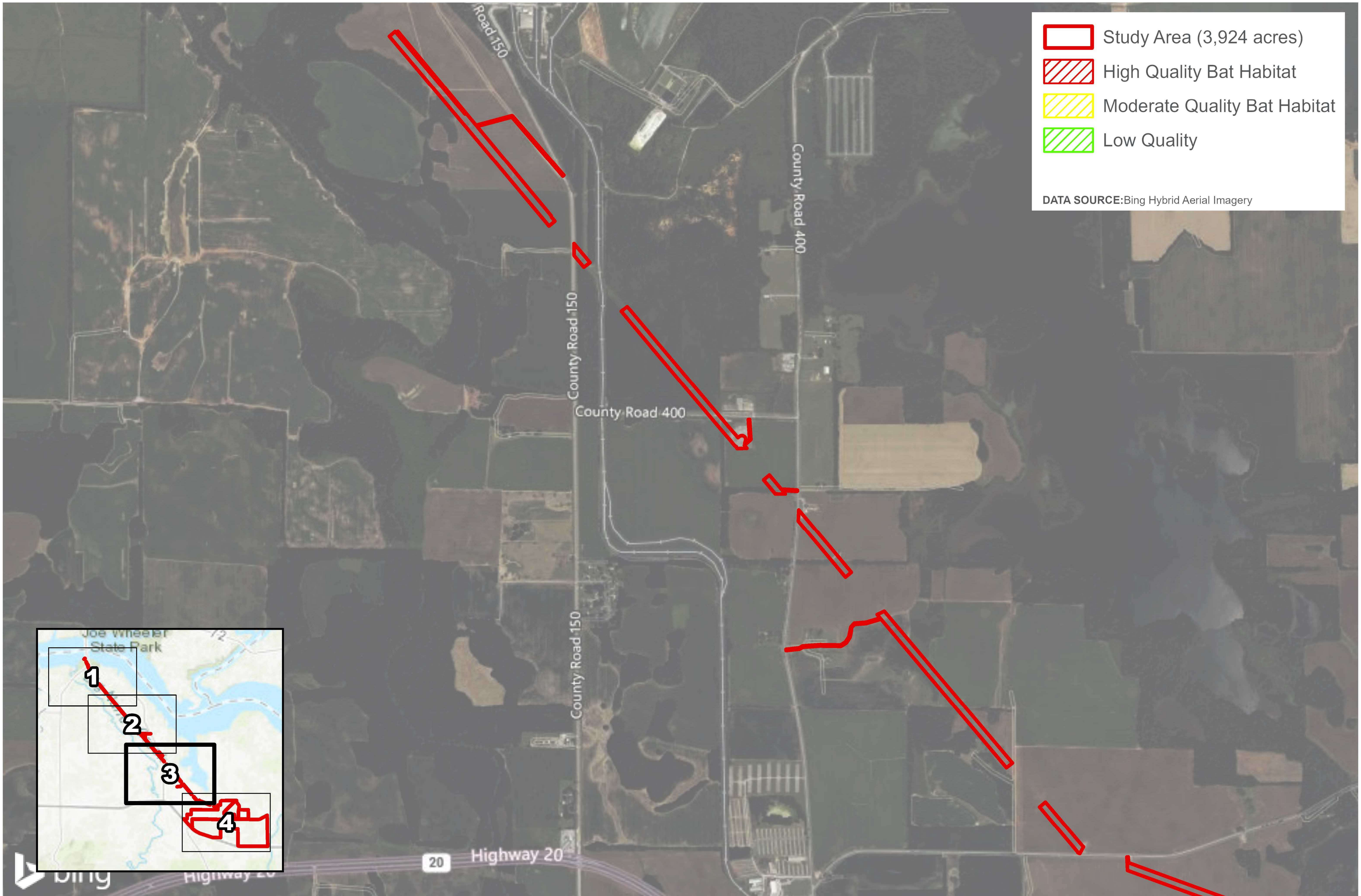

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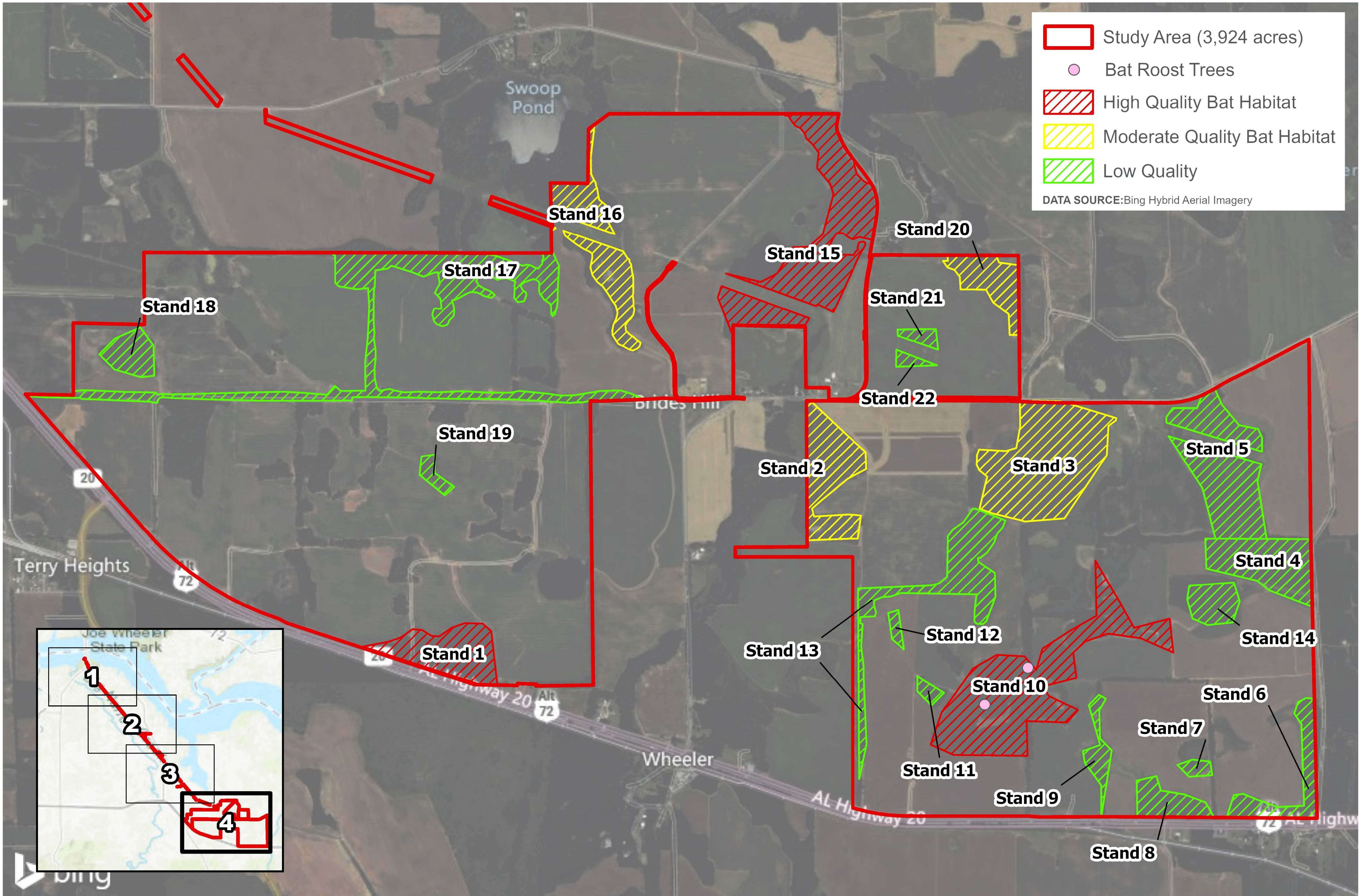
HILLSBORO SOLAR

POTENTIAL BAT HABITAT

FIGURE 4 - PAGE 3 OF 4



HILLSBORO SOLAR

POTENTIAL BAT HABITAT

FIGURE 4 - PAGE 4 OF 4

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B

Appendix B – Site Photos

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Photo 1 – Representative of agricultural vegetation community within TL Upgrade Area, facing southeast

Photo 2 – Representative of wet deciduous vegetation community in the Project Site, facing south-southeast

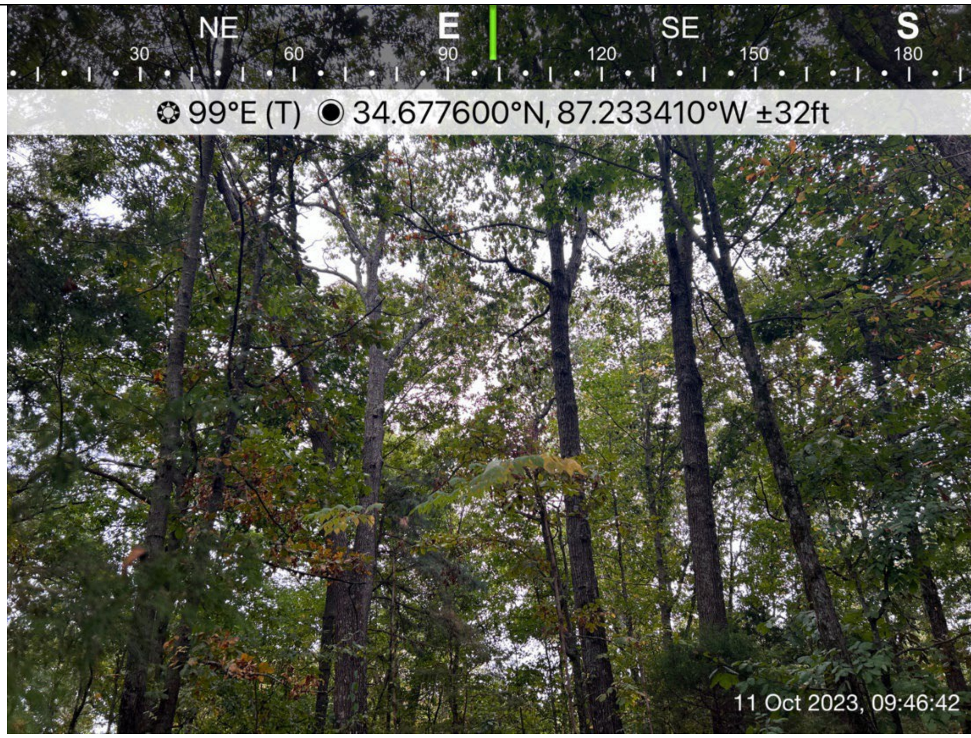

Photo 3 – Representative of dry deciduous vegetation community in the Project Site, facing east

Photo 4 – Representative of pine vegetation community in the Project Site, facing southeast

Photo 5 – Representative of clear cut area in the Project Site, facing south

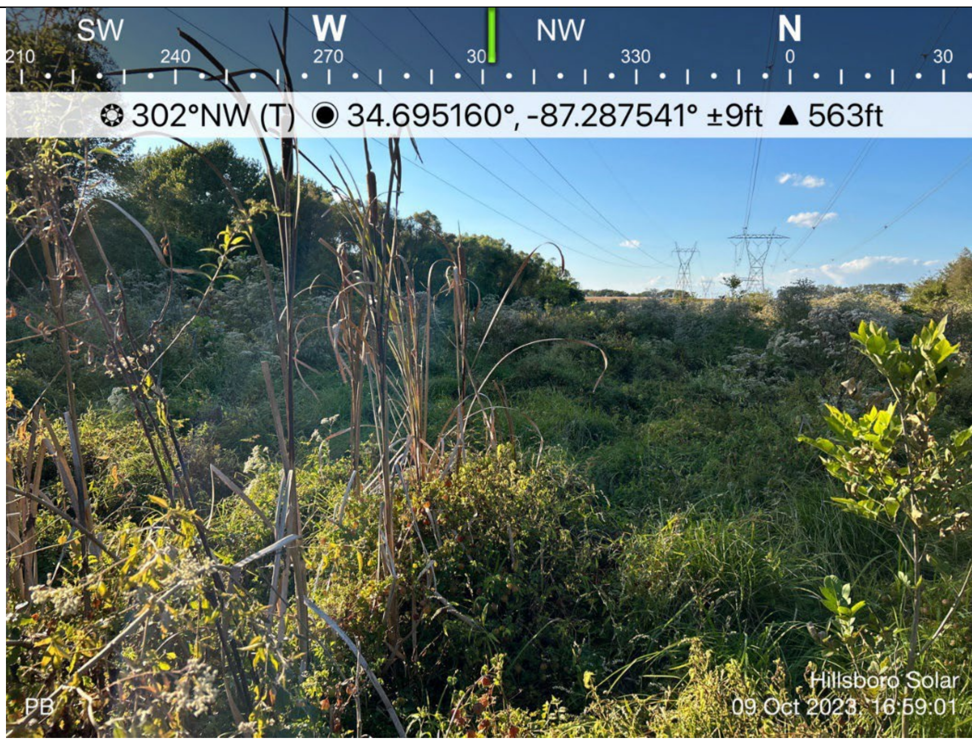

Photo 6 – Representative of dry herbaceous vegetation community in the TL Upgrade Areas, facing northwest

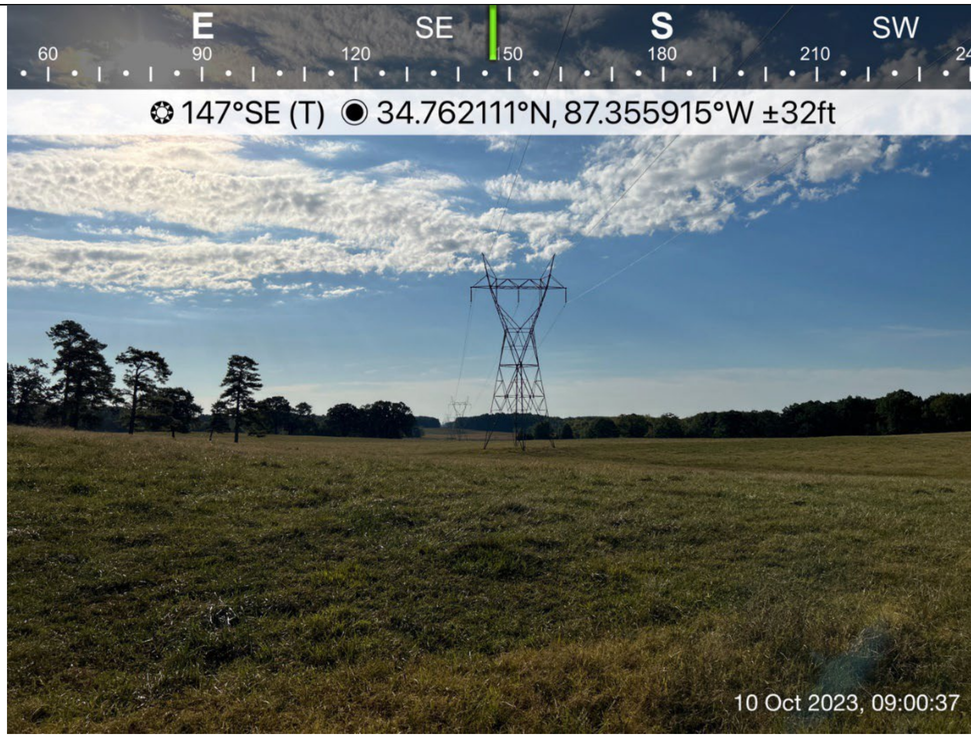

Photo 7 – Representative of open pasture vegetation community in the TL Upgrade Areas, facing southeast

Photo 8 – Representative of maintained lawn vegetation community in the TL Upgrade Areas, facing west

Photo 9 – Stand 1, High Quality Bat Habitat

Photo 10 – Stand 1, High Quality Bat Habitat

Photo 11 – Stand 2, High Quality Bat Habitat

Photo 12 – Stand 2, Moderate Quality Bat Habitat

Photo 13 – Stand 2, Moderate Quality Bat Habitat

Photo 14 – Stand 3, Moderate Quality Bat Habitat

Photo 15 – Stand 3, Moderate Quality Bat Habitat

Photo 16 – Stand 4, Low Quality Bat Habitat

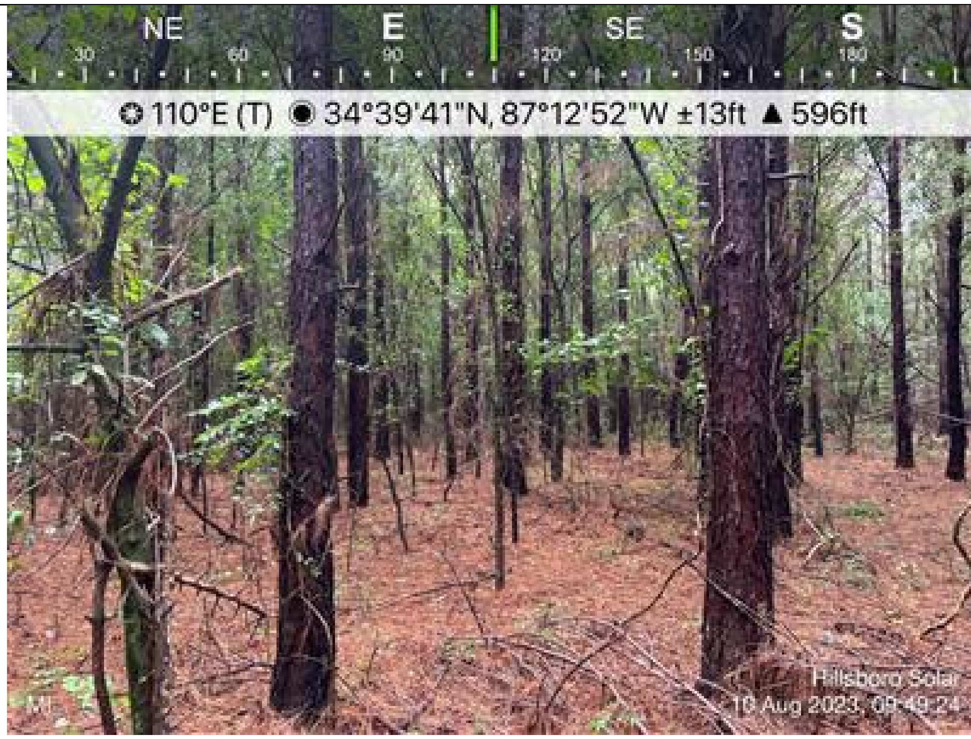

Photo 17 – Stand 4, Low Quality Bat Habitat

Photo 18 – Stand 5, Low Quality Bat Habitat

Photo 19 – Stand 5, Low Quality Bat Habitat

Photo 20 – Stand 6, Low Quality Bat Habitat

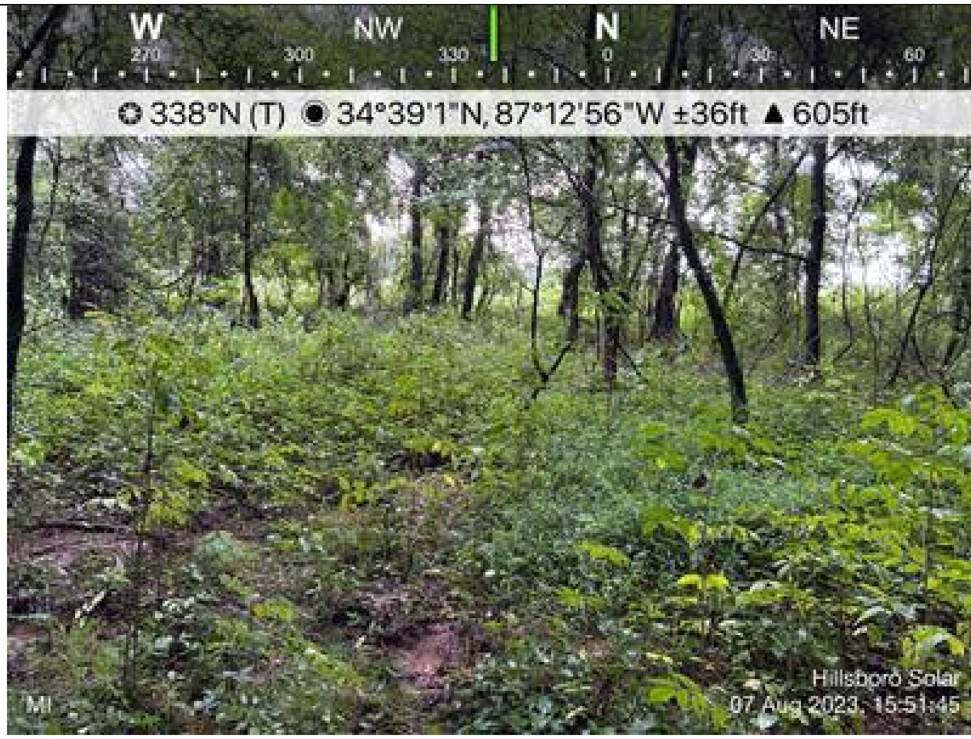

Photo 21 – Stand 6, Low Quality Bat Habitat

Photo 22 – Stand 7, Low Quality Bat Habitat

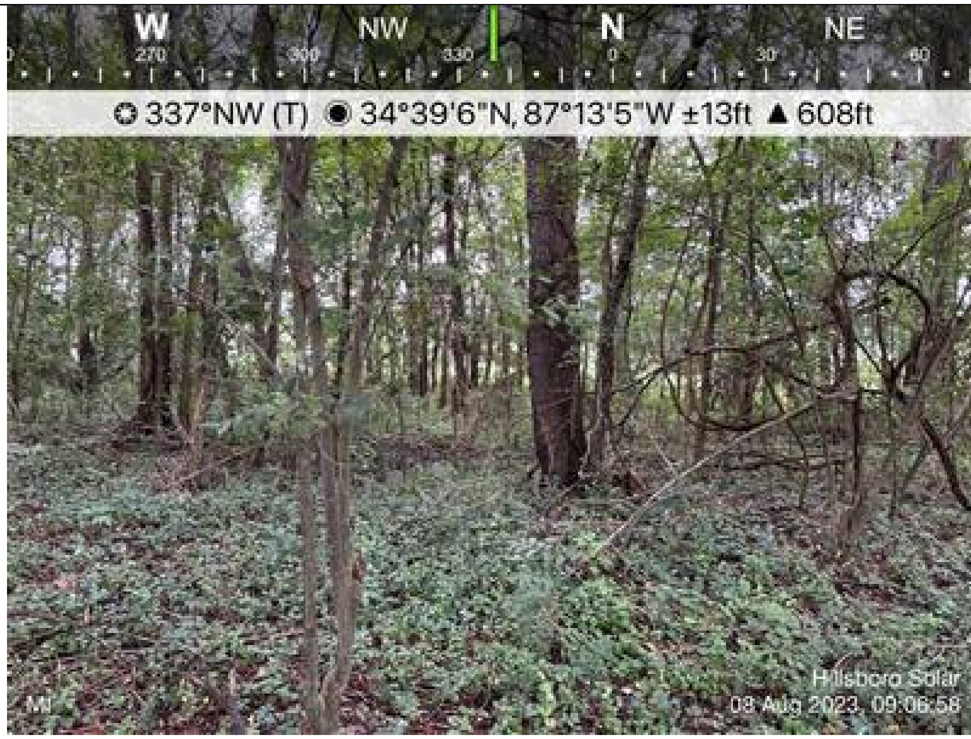

Photo 23 – Stand 7, Low Quality Bat Habitat

Photo 24 – Stand 8, Low Quality Bat Habitat

Photo 25 – Stand 8, Low Quality Bat Habitat

Photo 26 – Stand 9, Low Quality Bat Habitat

Photo 27 – Stand 9, Low Quality Bat Habitat

Photo 28 – Stand 10, High Quality Bat Habitat

Photo 29 – Stand 10, High Quality Bat Habitat

Photo 30 – Stand 10, High Quality Bat Habitat

Photo 31 – Stand 11, Low Quality Bat Habitat

Photo 32 – Stand 11, Low Quality Bat Habitat

Photo 33 – Stand 12, Low Quality Bat Habitat

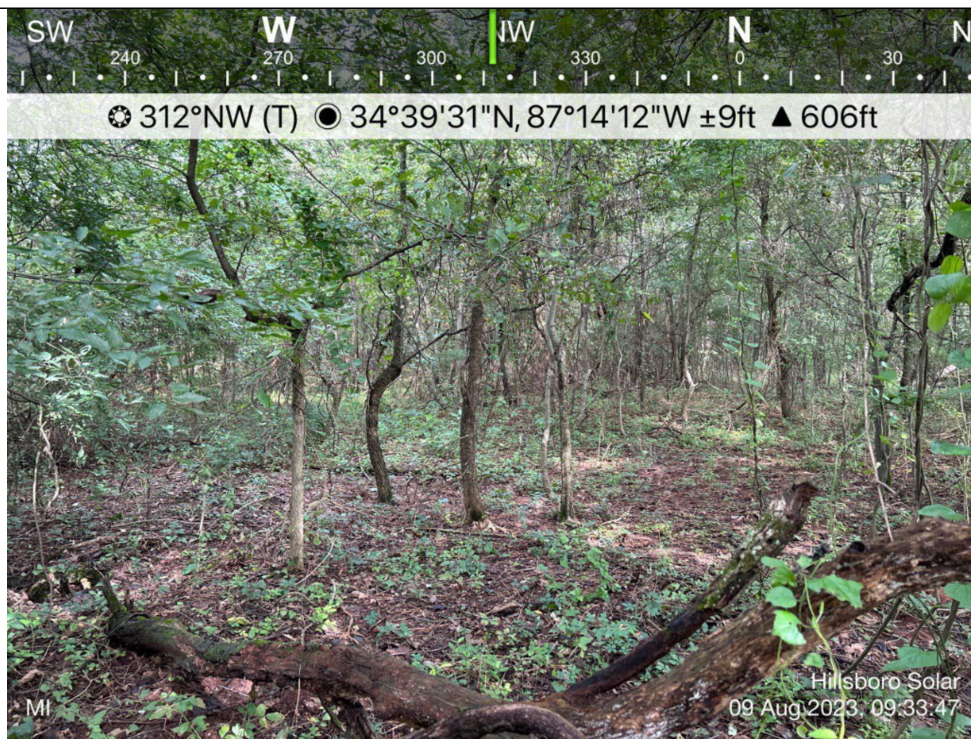

Photo 34 – Stand 12, Low Quality Bat Habitat

Photo 35 – Stand 12, Low Quality Bat Habitat

Photo 36 – Stand 13, Low Quality Bat Habitat

Photo 37 – Stand 13, Low Quality Bat Habitat

Photo 38 – Stand 14, Low Quality Bat Habitat

Photo 39 – Stand 14, Low Quality Bat Habitat

Photo 40 – Stand 15, High Quality Bat Habitat

Photo 41 – Stand 15, High Quality Bat Habitat

Photo 42 – Stand 16, Moderate Quality Bat Habitat

Photo 43 – Stand 16, Moderate Quality Bat Habitat

Photo 44 – Stand 16, Moderate Quality Bat Habitat

Photo 45 – Stand 17, Low Quality Bat Habitat

Photo 46 – Stand 17, Low Quality Bat Habitat

Photo 47 – Stand 18, Low Quality Bat Habitat

Photo 48 – Stand 18, Low Quality Bat Habitat

Photo 49 – Stand 19, Low Quality Bat Habitat

Photo 50 – Stand 20, Moderate Quality Bat Habitat

Photo 51 – Stand 21 and 22, Low Quality Bat Habitat

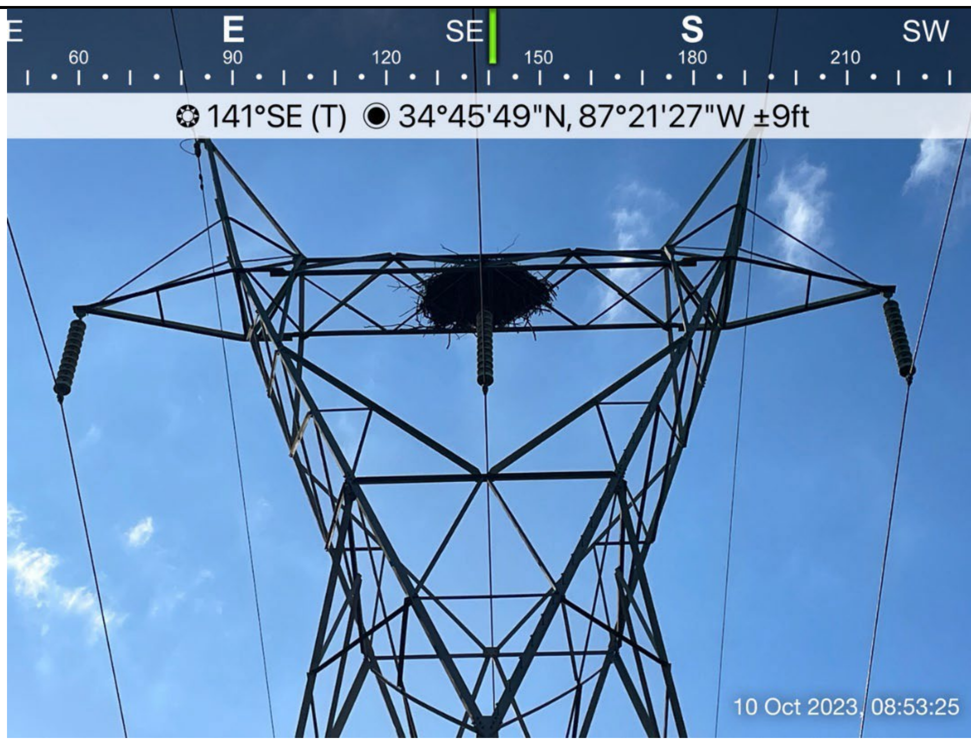

Photo 52 – Representative of Osprey nest in TL Upgrade Area

C

Appendix C – USFWS IPaC, TVA RNHD, Alabama NHP Results

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Alabama Ecological Services Field Office
1208 B Main Street
Daphne, AL 36526-4419
Phone: (251) 441-5181 Fax: (251) 441-6222
Email Address: alabama@fws.gov

In Reply Refer To: 11/19/2024 16:11:29 UTC
Project Code: 2025-0021414
Project Name: Hillsboro Solar

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Project consultation requests may be submitted by mail or email (Alabama@fws.gov). **Ensure that the Project Code in the header of this letter is clearly referenced in any request for consultation or correspondence submitted to our office.**

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. **Ensure that the Project Code in the header of this letter is clearly referenced with any request for consultation or correspondence about your project that you submit to our office.**

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Alabama Ecological Services Field Office
1208 B Main Street
Daphne, AL 36526-4419
(251) 441-5181

PROJECT SUMMARY

Project Code: 2025-0021414
Project Name: Hillsboro Solar
Project Type: Power Gen - Solar
Project Description: Construction of a solar facility and transmission line upgrades
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.67058975,-87.27119851936295,14z

Counties: Lawrence County, Alabama

ENDANGERED SPECIES ACT SPECIES

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane *Grus americana* Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential

CLAMS

NAME	STATUS
Longsolid *Fusconaia subrotunda* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9880	Threatened
Pink Mucket (pearlymussel) *Lampsilis abrupta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7829	Endangered
Spectaclecase (mussel) *Cumberlandia monodonta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Fleshy-fruit Gladecress *Leavenworthia crassa* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1435	Endangered

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Johanna Velasquez
Address: 440 S. Church Street
City: Charlotte
State: NC
Zip: 28202
Email johanna.velasquez@hdrinc.com
Phone: 9803375012

TVA Natural Heritage database queried by jhterrel on 07/05/2023 for the heritage review for TVA ESCS 43048 on Hillsboro III Solar

Records of federally-listed Aquatic Animals points located within Lawrence, AL county for HillsboroIII Solar HDB Query, Selection Map_Selection (Count: 5)

Scientific Name	Common Name	EO Rank (2*)	State	County	Federal Status (3*)
Elimia nassula	Round-rib Elimia	E - Verified extant (viability not assessed)	AL	LAWRENCE	UR
Etheostoma tuscumbia	Tuscumbia Darter	E - Verified extant (viability not assessed)	AL	LAWRENCE	UR
Lampsilis abrupta	Pink Mucket	H? - Possibly historical	AL	LAWRENCE	E
Lampsilis perovalis	Orange-nacre Mucket	E - Verified extant (viability not assessed)	AL	LAWRENCE	T
Percina sipsi	Bankhead Darter	BC - Good or fair estimated viability	AL	LAWRENCE	UR

Records of federally-listed Plants and Champion Trees points located within Lawrence, AL county for HillsboroIII Solar HDB Query, Selection Map_Selection (Count: 6)

Scientific Name	Common Name	EO Rank (2*)	State	County	Federal Status (3*)
Apios priceana	Price's Potato-bean	A - Excellent estimated viability	AL	LAWRENCE	LT
Dalea foliosa	Leafy Prairie-clover	E - Verified extant (viability not assessed)	AL	LAWRENCE	E
Helianthus eggertii	Eggert's Sunflower	E - Verified extant (viability not assessed)	AL	LAWRENCE	DL
Leavenworthia crassa	Fleshy-fruit Gladecress	C - Fair estimated viability	AL	LAWRENCE	E
Lesquerella lyrata	Lyre-leaf Bladderpod	E - Verified extant (viability not assessed)	AL	LAWRENCE	T
Stellaria fontinalis	Water Stitchwort	E - Verified extant (viability not assessed)	AL	LAWRENCE	UR

Records of federally-listed Terrestrial Animals points located within Lawrence, AL county for HillsboroIII Solar HDB Query, Selection Map_Selection (Count: 6)

Scientific Name	Common Name	EO Rank (2*)	State	County	Federal Status (3*)
Haliaeetus leucocephalus	Bald Eagle	AC - Excellent, good, or fair estimated viability	AL	LAWRENCE	DL
Myotis grisescens	Gray Bat	D - Poor estimated viability	AL	LAWRENCE	E
Myotis septentrionalis	Northern Long-eared Bat	D - Poor estimated viability	AL	LAWRENCE	E
Myotis sodalis	Indiana Bat	D - Poor estimated viability	AL	LAWRENCE	E
Perimyotis subflavus	Tricolored Bat	E - Verified extant (viability not assessed)	AL	LAWRENCE	PE
Picoides borealis	Red-cockaded Woodpecker	H - Historical	AL	LAWRENCE	E, PT

1* Source: TVA Regional Natural Heritage Database; USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/) -If Relevant

2* EO = Element Occurrence; Common ranks: A= Excellent est. viability/ecol. Integrity; B= Good est. viability/ecol. Integrity; C= Fair est. viability/ecol. Integrity;

E= Verified extant (viability/ecological integrity not assessed); H= Historical; X= Extirpated; NR= Not ranked. See Heritage Data Viewer Handbook for more ranks.

3* Status Codes: D= Deemed in Need of Management; DM= Delisted, still being monitored; E= Endangered; LE= Listed Endangered; LT= Listed Threatened; C= Candidate; PS= Partial Status; T= Threatened; E-P= Endangered/Possibly Extirp.; E-PT= Endangered/Proposed Threatened; RARE= Rare; SLNS= State listed, no status; S= Special Concern; S-P= Special Concern/Possibly Extirp.; S-CE= Special Concern/Commerc. Exploited; T-CE= Threatened/Commerc. Exploited

TVA Natural Heritage database queried by jhterrel on 07/05/2023 for the heritage review for TVA ESCS 43048 on Hillsboro III Solar

Records of state- and federally-listed Aquatic Animals points located within the HUC boundary of HillsboroIII Solar HDB Query, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Actinonaias ligamentina	Mucket	E - Verified extant (viability not assessed)	AL	S2	PSM	
Cambarus jonesi	Alabama Cave Crayfish	E - Verified extant (viability not assessed)	AL	S2		
Cambarus veitchorum	White Spring Cave Crayfish	H? - Possibly historical	AL	S1		
Campeloma decampi	Slender Campeloma	E - Verified extant (viability not assessed)	AL	S1	SP	E
Cumberlandia monodonta	Spectaclecase	E - Verified extant (viability not assessed)	AL	S1	SP	E
Dromus dromas	Dromedary Pearlymussel	X - Extirpated	AL	SX	SP	E, XN
Elassoma alabamae	Spring Pygmy Sunfish	E - Verified extant (viability not assessed)	AL	S1	SP	T
Elimia interveniens	Slowwater Elimia	E - Verified extant (viability not assessed)	AL	S2		
Elimia nassula	Round-rib Elimia	E - Verified extant (viability not assessed)	AL	S1		UR
Epioblasma torulosa torulosa	Tuberculed Blossom Pearlymussel	X - Extirpated	AL	SX	SP	E, PDL
Etheostoma boschungi	Slackwater Darter	E - Verified extant (viability not assessed)	AL	S1	SP	T
Etheostoma kennicotti	Stripetail Darter	H? - Possibly historical	AL	S3		
Etheostoma tuscumbia	Tuscumbia Darter	E - Verified extant (viability not assessed)	AL	S2	SP	UR
Hemitremia flammea	Flame Chub	H? - Possibly historical	AL	S3		
Lampsilis abrupta	Pink Mucket	E - Verified extant (viability not assessed)	AL	S1	SP	E
Lampsilis ovata	Pocketbook	E - Verified extant (viability not assessed)	AL	S2	PSM	
Lasmigona complanata	White Heelsplitter	H - Historical	AL	S2	PSM	
Noturus exilis	Slender Madtom	H? - Possibly historical	AL	S3	CNGF	
Obovaria olivaria	Hickorynut	H - Historical	AL	SX	PSM	
Obovaria retusa	Ring Pink	H - Historical	AL	SH	SP	E, XN
Plethobasus cooperianus	Orange-foot Pimpleback	H - Historical	AL	SX	SP	E, XN
Plethobasus cyphyus	Sheepnose	E - Verified extant (viability not assessed)	AL	S1	SP	E
Pleurobema cordatum	Ohio Pigtoe	H - Historical	AL	S2	PSM	
Pleurobema plenum	Rough Pigtoe	E - Verified extant (viability not assessed)	AL	S1	SP	E, XN
Pleurocera brumbyi	Spiral Hornsnail	E - Verified extant (viability not assessed)	AL	S2S3		
Pleurocera pyrenella	Skirted Hornsnail	E - Verified extant (viability not assessed)	AL	S2		
Pleuronaia barnesiana	Tennessee Pigtoe	E - Verified extant (viability not assessed)	AL	S1	PSM	UR
Potamilus ohiensis	Pink Papershell	E - Verified extant (viability not assessed)	AL	S3	PSM	
Ptychobranchus fasciolaris	Kidneyshell	H - Historical	AL	S2	PSM	
Toxolasma lividus	Purple Lilliput	E - Verified extant (viability not assessed)	AL	S2	PSM	
Toxolasma parvum	Lilliput	H - Historical	AL	S3	PSM	
Typhlichthys subterraneus	Southern Cavefish	E - Verified extant (viability not assessed)	AL	S3	SP	
Villosa taeniata	Painted Creekshell	H - Historical	AL	S2	PSM	

Records of state- and federally-listed Plants and Champion Trees points located within a 5 Mile radius search of HillsboroIII Solar HDB Query, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Eriogonum harperi	Harper's Umbrella-plant	E - Verified extant (viability not assessed)	AL	S1		
Isoetes butleri	Butler's Quillwort	E - Verified extant (viability not assessed)	AL	S2		
Leavenworthia crassa	Fleshy-fruit Gladecress	E - Verified extant (viability not assessed)	AL	S2		E
Leavenworthia uniflora	Michaux Leavenworthia	E - Verified extant (viability not assessed)	AL	S2		
Ophioglossum engelmannii	Limestone Adder's-tongue	E - Verified extant (viability not assessed)	AL	S3		
Paysonia densipila	Duck River Bladderpod	E - Verified extant (viability not assessed)	AL	S1		
Penstemon tenuiflorus	Beard-tongue	E - Verified extant (viability not assessed)	AL			
Schoenolirion croceum	Sunnybell	E - Verified extant (viability not assessed)	AL	S2		
Silphium pinnatifidum	Prairie-dock	E - Verified extant (viability not assessed)	AL	S2		

Records of Caves points located within a 3 Mile radius search of HillsboroIII Solar HDB Query, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of Terrestrial Animals points located within a 3 Mile radius search of HillsboroIII Solar HDB Query, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of Heritage Natural Areas points located within a 3 Mile radius search of HillsboroIII Solar HDB Query, Selection Map_Selection

MA Name	MA Type	MA Unit Code	State	Acres	Status	Key ID No
ECHOTA CHEROKEE	IR		AL	326770.11		Y
MALLARD-FOX CREEK WILDLIFE MANAGEMENT AREA ALABAMA	NI		AL	3908.96		Y

1* Source: TVA Regional Natural Heritage Database; USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/) -If Relevant
2* EO = Element Occurrence; Common ranks: A= Excellent est. viability/ecol. Integrity; B= Good est. viability/ecol. Integrity; C= Fair est. viability/ecol. Integrity; E= Verified extant (viability/ecological integrity not assessed); H= Historical; X= Extirpated; NR= Not ranked. See Heritage Data Viewer Handbook for more ranks.
3* State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S5 = Secure; SX = Presumed Extirpated. See Heritage Data Viewer Handbook for more ranks.
4* Status Codes: D= Deemed in Need of Management; DM= Delisted, still being monitored; E= Endangered; LE= Listed Endangered; LT= Listed Threatened; C= Candidate; PS= Partial Status; T= Threatened; E-P= Endangered/Possibly Extirp.; E-PT= Endangered/Proposed Threatened; RARE= Rare; SLNS= State listed, no status; S= Special Concern; S-P= Special Concern/Possibly Extirp.; S-CE= Special Concern/Commerc. Exploited; T-CE= Threatened/Commerc. Exploited
5* See Heritage Data Viewer Handbook for full scope of Natural Areas as well as definitions of Natural Area types and units.

TVA Natural Heritage database queried by jhterrel on 10/03/2023 for the HDB query for the TVA ESCS activity 43048 Hillsboro III Solar MOD1 TL (L5669 L5832)						
Records of state- and federally-listed Aquatic Animals points located within the HUC boundary of L5669 L5832, Selection Map_Selection						
Scientific Name	**Common Name**	**EO Rank (2*)**	**State**	**State Rank (3*)**	**State Status (4*)**	**Federal Status (4*)**
Actinonaias pectorosa	Pheasantshell	H - Historical	AL	SX	PSM	
Arcidens confragosus	Rock Pocketbook	D - Poor estimated viability	AL	S3	PSM	
Athearnia anthonyi	Anthony's River Snail	E - Verified extant (viability not assessed)	AL	S1	SP	E, XN
Cambarus jonesi	Alabama Cave Crayfish	E - Verified extant (viability not assessed)	AL	S2		
Cumberlandia monodonta	Spectaclecase	E - Verified extant (viability not assessed)	AL	S1	SP	E
Cyprogenia stegaria	Fanshell	C - Fair estimated viability	AL	S1	SP	E, XN
Dromus dromas	Dromedary Pearlymussel	E - Verified extant (viability not assessed)	AL	SX	SP	E, XN
Elimia interveniens	Slowwater Elimia	E - Verified extant (viability not assessed)	AL	S2		
Elimia nassula	Round-rib Elimia	E - Verified extant (viability not assessed)	AL	S1		UR
Ellipsaria lineolata	Butterfly	E - Verified extant (viability not assessed)	AL	S4	PSM	
Elliptio dilatata	Spike	E - Verified extant (viability not assessed)	AL	S1	PSM	
Epioblasma arcaeformis	Sugarspoon	H - Historical	AL	SX	PSM	
Epioblasma biemarginata	Angled Riffleshell	H - Historical	AL	SX	PSM	
Epioblasma brevidens	Cumberlandian Combshell	H - Historical	AL	S1	SP	E, XN
Epioblasma capsaeformis	Oyster Mussel	E - Verified extant (viability not assessed)	AL	SX	SP	E, XN
Epioblasma florentina florentina	Yellow-blossom Pearlymussel	X - Extirpated	AL	SX	SP	E, PDL
Epioblasma haysiana	Acornshell	H - Historical	AL	SX	PSM	
Epioblasma obliquata obliquata	Purple Catspaw	H - Historical	AL	SX	SP	E, XN
Epioblasma personata	Round Combshell	X - Extirpated	AL	SX	PSM	
Epioblasma stewardsonii	Cumberland Leafshell	X - Extirpated	AL	SX	PSM	
Epioblasma torulosa torulosa	Tuberculed Blossom Pearlymussel	X - Extirpated	AL	SX	SP	E, PDL
Epioblasma triquetra	Snuffbox	H - Historical	AL	S1	PSM	E
Epioblasma turgidula	Turgid Blossom Pearlymussel	X - Extirpated	AL	SX	SP	E, PDL
Erimonax monachus	Spotfin Chub	X - Extirpated	AL	SX	SP	T, XN
Etheostoma tuscumbia	Tuscumbia Darter	E - Verified extant (viability not assessed)	AL	S2	SP	UR
Fusconaia cor	Shiny Pigtoe Pearlymussel	X - Extirpated	AL	S1	SP	E, XN
Fusconaia cuneolus	Fine-rayed Pigtoe	H - Historical	AL	S1	SP	E, XN
Fusconaia subrotunda	Longsolid	H - Historical	AL	S1	PSM	T
Hemistena lata	Cracking Pearlymussel	H - Historical	AL	S1	SP,P1	E, XN
Lampsilis abrupta	Pink Mucket	E - Verified extant (viability not assessed)	AL	S1	SP	E
Lampsilis fasciola	Wavy-rayed Lampmussel	H - Historical	AL	S2	PSM	
Lampsilis ovata	Pocketbook	E - Verified extant (viability not assessed)	AL	S2	PSM	
Lampsilis virescens	Alabama Lampmussel	X - Extirpated	AL	S1	SP	E, XN
Lasmigona complanata	White Heelsplitter	H - Historical	AL	S2	PSM	

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Lemiox rimosus	Birdwing Pearlymussel	E - Verified extant (viability not assessed)	AL	S1	SP	E, XN
Leptodea leptodon	Scaleshell	H - Historical	AL	SX	SP	E
Leptoxis minor	Knob Mudalia	H - Historical	AL	SX		
Ligumia recta	Black Sandshell	E - Verified extant (viability not assessed)	AL	S2	PSM	
Lithasia armigera	Armored Rocksnail	E - Verified extant (viability not assessed)	AL	S1		
Lithasia geniculata	Ornate Rocksnail	E - Verified extant (viability not assessed)	AL	S1		
Lithasia lima	Warty Rocksnail	H - Historical	AL	S1		
Lithasia salebrosa	Muddy Rocksnail	E - Verified extant (viability not assessed)	AL	S1		
Lithasia verrucosa	Varicose Rocksnail	H - Historical	AL	S3		
Medionidus conradicus	Cumberland Moccasinshell	H - Historical	AL	S1	SP	UR
Obovaria olivaria	Hickorynut	H - Historical	AL	SX	PSM	
Obovaria retusa	Ring Pink	C - Fair estimated viability	AL	SH	SP	E, XN
Obovaria subrotunda	Round Hickorynut	H - Historical	AL	S2	PSM	T
Palaemonias alabamae	Alabama Blind Cave Shrimp	E - Verified extant (viability not assessed)	AL	S1	SP	E
Percina tanasi	Snail Darter	AB - Excellent or good estimated viability	AL	S1	SP	DL
Plethobasus cicatricosus	White Wartyback	E - Verified extant (viability not assessed)	AL	S1	SP	E, XN
Plethobasus cooperianus	Orange-foot Pimpleback	H - Historical	AL	SX	SP	E, XN
Plethobasus cyphyus	Sheepnose	E - Verified extant (viability not assessed)	AL	S1	SP	E
Pleurobema clava	Clubshell	H - Historical	AL	SX	SP	E, XN
Pleurobema cordatum	Ohio Pigtoe	C - Fair estimated viability	AL	S2	PSM	
Pleurobema oviforme	Tennessee Clubshell	H - Historical	AL	S1	PSM	UR
Pleurobema plenum	Rough Pigtoe	E - Verified extant (viability not assessed)	AL	S1	SP	E, XN
Pleurobema rubrum	Pyramid Pigtoe	E - Verified extant (viability not assessed)	AL	S1	SP	PT
Pleurobema sintoxia	Round Pigtoe	E - Verified extant (viability not assessed)	AL	S1	SP	
Pleurocera alveare	Rugged Hornsnail	H - Historical	AL	S1		
Pleurocera brumbyi	Spiral Hornsnail	E - Verified extant (viability not assessed)	AL	S2S3		
Pleurocera corpulenta	Corpulent Hornsnail	H - Historical	AL	S1		UR
Pleurocera curta	Shortspire Hornsnail	H - Historical	AL	S1S2		UR
Pleurocera walkeri	Telescope Hornsnail	H - Historical	AL	S3		
Pleuronaia barnesiana	Tennessee Pigtoe	E - Verified extant (viability not assessed)	AL	S1	PSM	UR
Pleuronaia dolabelloides	Slabside Pearlymussel	H - Historical	AL	S1	SP	E
Procambarus pecki	Phantom Cave Crayfish	H? - Possibly historical	AL	S1S2		
Ptychobranchus fasciolaris	Kidneyshell	E - Verified extant (viability not assessed)	AL	S2	PSM	
Ptychobranchus subtentum	Fluted Kidneyshell	H - Historical	AL	SX	SP	E
Quadrula cylindrica cylindrica	Smooth Rabbitsfoot	C - Fair estimated viability	AL	S1	SP	T
Quadrula intermedia	Cumberland Monkeyface	X - Extirpated	AL	SX	SP	E, XN

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Speoplatyrhinus poulsoni	Alabama Cavefish	E - Verified extant (viability not assessed)	AL	S1	SP	E
Theliderma metanevra	Monkeyface	E - Verified extant (viability not assessed)	AL	S3	PSM	
Toxolasma lividus	Purple Lilliput	E - Verified extant (viability not assessed)	AL	S2	PSM	
Toxolasma parvum	Lilliput	H - Historical	AL	S3	PSM	
Truncilla truncata	Deertoe	E - Verified extant (viability not assessed)	AL	S1	PSM	
Typhlichthys subterraneus	Southern Cavefish	E - Verified extant (viability not assessed)	AL	S3	SP	
Villosa fabalis	Rayed Bean	H - Historical	AL	SX		E
Villosa taeniata	Painted Creekshell	H - Historical	AL	S2	PSM	
Villosa vanuxemensis	Mountain Creekshell	H? - Possibly historical	AL	S3	PSM	

Records of state- and federally-listed Plants and Champion Trees points located within a 5 Mile radius search of L5669 L5832, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Alabama Champion Tree	Alabama Champion Tree	E - Verified extant (viability not assessed)	AL			
Armoracia lacustris	Lake-cress	H? - Possibly historical	AL	S1		
Celastrus scandens	climbing bittersweet	H - Historical	AL	S1		
Isoetes butleri	Butler's Quillwort	H? - Possibly historical	AL	S2		

Records of Caves points located within a 3 Mile radius search of L5669 L5832, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
AL Lauderdale County Cave	A cave	Not ranked	AL			
AL Lauderdale County Cave	A cave	Not ranked	AL			
AL Lauderdale County Cave	A cave	Not ranked	AL			
AL Lawrence County Cave	A cave	Not ranked	AL			

Records of Terrestrial Animals points located within a 3 Mile radius search of L5669 L5832, Selection Map_Selection

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)
Colonial Wading Bird Colony	Colonial Wading Bird Colony	E - Verified extant (viability not assessed)	AL	SNR		
Corynorhinus rafinesquii	Rafinesque’s Big-eared bat	H - Historical	AL	S2	SP	
Haliaeetus leucocephalus	Bald Eagle	Not ranked	AL	S4B	SP	DL
Haliaeetus leucocephalus	Bald Eagle	AC - Excellent, good, or fair estimated viability	AL	S4B	SP	DL
Haliaeetus leucocephalus	Bald Eagle	E - Verified extant (viability not assessed)	AL	S4B	SP	DL
Haliaeetus leucocephalus	Bald Eagle	E - Verified extant (viability not assessed)	AL	S4B	SP	DL
Macrochelys temminckii	Alligator Snapping Turtle	H? - Possibly historical	AL	S3	SP	PT

Scientific Name	Common Name	EO Rank (2*)	State	State Rank (3*)	State Status (4*)	Federal Status (4*)

Records of Heritage Natural Areas points located within a 3 Mile radius search of L5669 L5832, Selection Map_Selection

MA Name	MA Type	MA Unit Code	State	Acres	Status	Key ID No
JOE WHEELER STATE PARK	SXXSP		AL	2441.36		Y
WHEELER DAM TAILWATER RESTRICTED MUSSEL HARVEST AREA	SACMS		AL	2028.64		Y

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3* State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S5 = Secure; SX = Presumed Extirpated. See Heritage Data Viewer Handbook for more ranks.
4* Status Codes: D= Deemed in Need of Management; DM= Delisted, still being monitored; E= Endangered; LE= Listed Endangered; LT= Listed Threatened; C= Candidate; PS= Partial Status; T= Threatened; E-P= Endangered/Possibly Extirp.; E-PT= Endangered/Proposed Threatened; RARE= Rare; SLNS= State listed, no status; S= Special Concern; S-P= Special Concern/Possibly Extirp.; S-CE= Special Concern/Commerc. Exploited; T-CE= Threatened/Commerc. Exploited
5* See Heritage Data Viewer Handbook for full scope of Natural Areas as well as definitions of Natural Area types and units.

TVA Natural Heritage database queried by jhterrel on 10/03/2023 for the HDB query for the TVA ESCS activity 43048 Hillsboro III Solar MOD1 TL (L5669 L5832)

Records of federally-listed Aquatic Animals points located within Lawrence, AL county for L5669 L5832, Selection Map_Selection (Count: 5)

Scientific Name	Common Name	EO Rank (2*)	State	County	Federal Status (3*)
Elimia nassula	Round-rib Elimia	E - Verified extant (viability not assessed)	AL	LAWRENCE	UR
Etheostoma tuscumbia	Tuscumbia Darter	E - Verified extant (viability not assessed)	AL	LAWRENCE	UR
Lampsilis abrupta	Pink Mucket	H? - Possibly historical	AL	LAWRENCE	E
Lampsilis perovalis	Orange-nacre Mucket	E - Verified extant (viability not assessed)	AL	LAWRENCE	T
Percina sipsi	Bankhead Darter	BC - Good or fair estimated viability	AL	LAWRENCE	UR

Records of federally-listed Plants and Champion Trees points located within Lawrence, AL county for L5669 L5832, Selection Map_Selection (Count: 6)

Scientific Name	Common Name	EO Rank (2*)	State	County	Federal Status (3*)
Apios priceana	Price's Potato-bean	A - Excellent estimated viability	AL	LAWRENCE	LT
Dalea foliosa	Leafy Prairie-clover	E - Verified extant (viability not assessed)	AL	LAWRENCE	E
Helianthus eggertii	Eggert's Sunflower	E - Verified extant (viability not assessed)	AL	LAWRENCE	DL
Leavenworthia crassa	Fleshy-fruit Gladecress	C - Fair estimated viability	AL	LAWRENCE	E
Lesquerella lyrata	Lyre-leaf Bladderpod	E - Verified extant (viability not assessed)	AL	LAWRENCE	T
Stellaria fontinalis	Water Stitchwort	E - Verified extant (viability not assessed)	AL	LAWRENCE	UR

Records of federally-listed Terrestrial Animals points located within Lawrence, AL county for L5669 L5832, Selection Map_Selection (Count: 6)

Scientific Name	Common Name	EO Rank (2*)	State	County	Federal Status (3*)
Haliaeetus leucocephalus	Bald Eagle	AC - Excellent, good, or fair estimated viability	AL	LAWRENCE	DL
Myotis grisescens	Gray Bat	D - Poor estimated viability	AL	LAWRENCE	E
Myotis septentrionalis	Northern Long-eared Bat	D - Poor estimated viability	AL	LAWRENCE	E
Myotis sodalis	Indiana Bat	D - Poor estimated viability	AL	LAWRENCE	E
Perimyotis subflavus	Tricolored Bat	E - Verified extant (viability not assessed)	AL	LAWRENCE	PE
Picoides borealis	Red-cockaded Woodpecker	H - Historical	AL	LAWRENCE	E, PT

1* Source: TVA Regional Natural Heritage Database; USFWS Information for Planning and Consultation (IPaC) resource list (https://ecos.fws.gov/ipac/) -If Relevant

2* EO = Element Occurrence; Common ranks: A= Excellent est. viability/ecol. Integrity; B= Good est. viability/ecol. Integrity; C= Fair est. viability/ecol. Integrity; E= Verified extant (viability/ecological integrity not assessed); H= Historical; X= Extirpated; NR= Not ranked. See Heritage Data Viewer Handbook for more ranks.

3* Status Codes: D= Deemed in Need of Management; DM= Delisted, still being monitored; E= Endangered; LE= Listed Endangered; LT= Listed Threatened; C= Candidate; PS= Partial Status; T= Threatened; E-P= Endangered/Possibly Extirp.; E-PT= Endangered/Proposed Threatened; RARE= Rare; SLNS= State listed, no status; S= Special Concern; S-P= Special Concern/Possibly Extirp.; S-CE= Special Concern/Commerc. Exploited; T-CE= Threatened/Commerc. Exploited

AL NHP database query of Lawrence County for Hillsboro Solar		
Scientific Name	**Common Name**	**State Rank**
Cheumatopsyche kinlockensis	A Caddisfly	S1
Batriasymmodes spelaeus	A Cave Obligate Beetle	S3
Trisetobisium fallax	A Pseudoscorpion	S1
Leavenworthia alabamica	Alabama Glade-cress	S2
Delphinium alabamicum	Alabama Larkspur	S3
Medionidus acutissimus	Alabama Moccasinshell	S2
Villosa nebulosa	Alabama Rainbow	S3
Pachysandra procumbens	Allegheny-spurge	S2S3
Sylvilagus obscurus	Appalachian Cottontail	S1
Haliaeetus leucocephalus	Bald Eagle	S4B
Percina sipsi	Bankhead Darter	S1
Asplenium bradleyi	Bradley's Spleenwort	S2
Trichomanes boschianum	Bristle Fern	S3
Isoetes butleri	Butler's Quillwort	S2
Juglans cinerea	Butternut	S1
Agapetus hessi	Caddisfly	S1
Dolophilodes major	Caddisfly	S1
Hydroptila coweetensis	Caddisfly	S1
Neophylax atlanta	Caddisfly	S1
Neophylax concinnus	Caddisfly	S1
Neophylax ornatus	Caddisfly	S1
Neophylax securis	Caddisfly	S1S2
Orthotrichia baldufi	Caddisfly	S1
Platycentropus radiatus	Caddisfly	S1
Rhyacophila carolae	Caddisfly	S1
Rhyacophila minor	Caddisfly	S1
Lilium canadense	Canada Lily	S2
Anemone caroliniana	Carolina Anemone	S3
Frasera caroliniensis	Carolina Gentian	S2
Cicurina minima	Cave Spider	SNR
Plestiodon anthracinus	Coal Skink	S3
Silphium brachiatum	Cumberland Rosinweed	S2
Lesquerella densipila	Duck River Bladderpod	S1
Dicentra cucullaria	Dutchman's Breeches	S2
Trichomanes petersii	Dwarf Filmy-fern	S2
Spilogale putorius	Eastern Spotted Skunk	S2S3
Helianthus eggertii	Eggert's Sunflower	S2
Viola egglestonii	Eggleston's Violet	S1
Sida elliottii	Elliott's Fan-petal	S3
Leavenworthia crassa	Fleshy-fruit Glade Cress	S2
Dalea gattingeri	Gattinger's Prairie Clover	S3
Penstemon tenuiflorus	Glade Beardtongue	S2S3

Scientific Name	**Common Name**	**State Rank**
Hydrastis canadensis	Golden Seal	S2
Dryopteris goldiana	Goldie's Woodfern	S1
Hymenophyllum tayloriae	Gorge Filmy Fern	S1
Myotis grisescens	Gray Myotis	S2
Linum sulcatum var. harperi	Harper's Grooved-yellow Flax	S1
Eriogonum longifolium var. harperi	Harper's Umbrella Plant	S1
Myotis sodalis	Indiana Myotis	S2
Armoracia lacustris	Lake Cress	S1
Isotria verticillata	Large Whorled Pogonia	S2
Dalea foliosa	Leafy Prairie Clover	S1
Ophioglossum engelmannii	Limestone Adder's-tongue	S3
Phemeranthus calcaricus	Limestone Fame-flower	S2
Thalictrum mirabile	Little Mountain Meadowrue	S2
Villosa lienosa	Little Spectaclecase	S5
Dryopteris celsa	Log Fern	S2
Paysonia lyrata	Lyrate Bladderpod	S1
Phemeranthus mengesii	Menge's Fame-flower	S3
Leavenworthia uniflora	Michaux Leavenworthia	S2
Stewartia ovata	Mountain Camellia	S2S3
Diplazium pycnocarpon	Narrow-leaved Glade Fern	S1S2
Pediomelum subacaule	Nashville Breadroot	S2
Trillium flexipes	Nodding Trillium	S2S3
Myotis septentrionalis	Northern Myotis	S2
Hamiota perovalis	Orangenacre Mucket	S2
Arnoglossum plantagineum	Prairie Indian Plantain	S1?
Trillium recurvatum	Prairie Trillium	S2
Silphium pinnatifidum	Prairie-dock	S2
Apios priceana	Price's Potato-bean	S2
Toxolasma lividum	Purple Lilliput	S2
Aplectrum hyemale	Puttyroot	S2
Dryobates borealis	Red-cockaded Woodpecker	S2
Huperzia porophila	Rock Clubmoss	S1
Silene rotundifolia	Roundleaf Catchfly	S1S2
Drosera rotundifolia	Round-leaved Sundew	S1
Huperzia lucidula	Shining Clubmoss	S2
Onosmodium molle ssp. molle	Soft False Gromwell	S2
Strophitus subvexus	Southern Creekmussel	S3
Lampsilis straminea	Southern Fatmucket	S4
Thalictrum debile	Southern Meadowrue	S2
Listera australis	Southern Twayblade	S3
Geum vernum	Spring Avens	S1
Monotropsis odorata var. odorata	Sweet Pinesap	S1
Astragalus tennesseensis	Tennessee Milkvetch	S1S2

Scientific Name	Common Name	State Rank
Ptychobranchus greenii	Triangular Kidneyshell	S1
Etheostoma tuscumbia	Tuscumbia Darter	S2
Pleurobema rubellum	Warrior Pigtoe	S1
Stellaria fontinalis	Water Stitchwort	S1
Phlox pulchra	Wherry's Phlox	S1
Erythronium albidum	White Trout Lily	S1S2
Cypripedium pubescens	Yellow Lady's-slipper	S3
Schoenolirion croceum	Yellow Sunnybell	S2

D

Appendix D – Protected Species Table

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Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Mammals				
Appalachian Cottontail *Sylvilagus obscurus*	S1	--	Montane areas of high elevation coniferous forests as well as areas providing dense cove	No
Eastern Spotted Skunk *Spilogale putorius*	S2S3	--	Rocky outcrops, open prairies, brushy areas, cultivated fields, and barnyards	Yes
Gray Bat *Myotis grisescens*	S2	FE	Roosts in caves or karst features year-round. Various foraging habitats including wet meadows, damp woods, and uplands	Yes (foraging)
Indiana Bat *Myotis sodalist*	S2	FE	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures and sinkhole fissures/karst features; statewide.	Yes (roosting and foraging)
Northern Long-eared Bat *Myotis septentrionalis*	--	FE	Various habitats including wet meadows, damp woods, and uplands, including abandoned structures, sinkhole/karst features; statewide.	Yes (roosting and foraging)
Tricolored Bat *Perimyotis subflavus*	--	FPE	Generally associated with forested landscapes but may roost near openings.	Yes (roosting and foraging)
Birds				
Bald Eagle *Haliaeetus leucocephalus*	S4	BGEPA	Nests in tall, mature trees near large bodies of water such as large rivers, lakes, reservoirs, and coastal areas	No
Red-cockaded Woodpecker *Dryobates borealis*	S2	FE, PT	Mature pine forests with very open understory maintained by frequent fires.	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Whooping Crane *Grus americana*	--	EXPN	Shallow markets with adjacent open grasslands.	No
Reptiles				
Coal Skink *Plestiodon anthracinus*	S3		Humid wooded areas with abundant leaf litter and loose rocks; vicinity of springs, swamps, and bogs	Yes
Fish				
Bankhead Darter *Percina sipsi*	S1		Found over gravel substrate in pools and the heads of riffles in creeks to medium rivers.	Yes
Flame Chub *Hemitremia flammea*	S3		Springs and spring-fed streams with lush aquatic vegetation.	No
Slackwater Darter *Etheostoma boschungi*	S1, SP	FT	Gravel-bottomed creeks and small rivers; spawns in seepage water in fields and open woods.	Yes
Slender Madtom *Noturus exilis*	S3		Riffles of small- to medium-sized permanent spring-fed creeks with moderate to swift currents.	Yes
Southern Cavefish *Typhlichthys subterraneus*	S3, SP		Aquatic cave obligate; cave streams, karst waters, and water supply wells.	No
Spring Pygmy Sunfish *Elassoma alabamae*	S1, SP	FT	Spring pools and spring runs, typically in calm, clear water with abundant aquatic vegetation.	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Stripetail Darter *Etheostoma kennicotti*	S3		Rocky pools of creeks and small rivers.	Yes
Tuscumbia Darter *Noturus exilis*	S2, SP	UR	Ponded spring-fed habitats of valley floor springs.	Yes; Known
Crustaceans				
Alabama Cave Crayfish *Cambarus jonesi*	S2		Underground cave systems in the Tennessee River Basin.	No
White Spring Cave Crayfish *Cambarus veitchorum*	S1		Cave-dwelling species known only from the White Spring Cave.	No
Mollusks				
Alabama Moccasinshell *Medionidus acutissimus*	S2		Small-medium sized rivers, in shallow areas with current and substrates of fine gravel, sand, & silt; occurs in the Mobile Basin and Gulf Coast drainage.	Yes
Alabama Rainbow *Villosa nebulosa*	S3		Creeks to medium-sized rivers in sand/gravel riffles with moderate current; occurs in the Mobile Basin upstream of the Fall Line.	Yes
Dromedary Pearlymussel *Dromus dromas*	SX, SP	LE, EXPN	Medium-large rivers with riffles and shoals w/ relatively firm rubble, gravel, and stable substrates; endemic to Cumberlandian Region.	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Hickorynut *Obovaria olivaria*	SX, PSM		Large rivers and lakes in sand or sand/gravel substrates; historically occurred in Tennessee River upstream to Muscle shoals, currently extirpated.	No
Kidneyshell *Ptychobranchus fasciolaris*	S2, PSM		High water quality creeks, rivers, and lakes with moderate to swift currents and sand or gravel substrates; occurs in Tennessee River system.	Yes
Lilliput *Toxolasma parvum*	S3, PSM		Quiet waters of low-gradient streams, river, and reservoirs, often in muddy bottoms; Tennessee River system, Mobile Basin, and Gulf Coast drainages.	No
Mucket *Actinonaias ligamentina*	S2, PSM		Medium to large rivers over coarse sand and gravel substrate; restricted to Tennessee River drainage.	No
Ohio Pigtoe *Pleurobema cordatum*	S2, PSM		Medium to large rivers with moderate flow and sand or gravel substrate but may also tolerate some reservoir environments.	No
Orangeacre Mucket *Hamiota perovalis*	S2		Stable sand, gravel, and cobble substrates with moderate to swift current in large streams and small rivers; endemic to western Mobile Basin.	No
Orangefoot Pimpleback *Plethobasus cooperianus*	SX, SP	FE, EXPN	Perennial streams with rocky areas and swift to slow moving currents; historically in Tennessee River Basin, currently extirpated.	Yes
Painted Creekshell *Villosa taeniata*	S2, PSM		Found in substrates of mixed sand and gravel with good current in less than three feet of water in rivers of all sizes; endemic to Cumberlandian Region.	**No**
Pink Mucket	S1, SP	FE	Large rivers with sand-gravel or rocky substrates with moderate to strong currents; restricted to Tennessee River system, specifically in tailwaters of Tennessee	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Lampsilis abrupta			River dams and a short reach of Bear Creek in Colbert County.	
Pink Papershell *Potamilus ohiensis*	S3, PSM		Large rivers with mud, sand, or silt bottoms in Mississippi drainage.	**No**
Pocketbook *Lampsilis ovata*	S2, PSM		Large creeks or small rivers with strong currents, with shoals and pools and occasionally in riffles; endemic to Tennessee River drainage.	**Yes**
Purple Lilliput *Toxolasma lividum*	S2		Small-medium sized rivers & lg creeks, in mud, sand, & gravel substrates; restricted to Tennessee River drainage	**Yes**
Ring Pink *Obovaria retusa*	SH, SP	FE, EXPN	Large rivers in sand and gravel; restricted to Tennessee River system.	No
Rough Pigtoe *Pleurobema plenum*	S1, SP	FE, EXPN	Medium to large rivers, in substrates ranging from mud and sand to gravel, cobble, and boulders;	No
Round-rib Elimia *Elimia nassula*	S1	UR	Springs and spring branches in Colbert and Madison counties.	No
Sheepnose Mussel *Plethobasus cyphyus*	S1, SP	FE	Large to medium-sized rivers, in riffles and coarse sand/gravel substrate.	No
Skirted Hornsnail *Pleurocera pyrenella*	S2		Creeks and mediums rivers that are tributaries of the Tennessee River in north-central Alabama	Yes

Common Name **Scientific *Name***	**State Rank and Listing Status[1,2]**	**Federal Listing Status[1]**	**Habitat Requirements**	**Potential Habitat Present**
Slender Campeloma *Campeloma decampi*	S1, SP	FE	Burrows in soft sediment, detritus, and sometimes in gravel substrates anywhere from the margins to midstream.	Yes
Slowwater Elimia *Elimia interveniens*	S2		Inhabits rocks, sandy, and muddy substrate in lakes, ponds, and rivers.	No
Spectaclecase *Cumberlandia monodonta*	S1, SP	FE	Medium to large rivers; in substrates ranging from mud and sand to gravel, cobble, and boulders.	No
Spiral Hornsnail *Pleurocera brumbyi*	S2S3		Creeks and medium rivers that are tributaries of the Tennessee River in northern Alabama.	Yes[2]
Tennessee Pigtoe *Pleuronaia barnesiana*	S1, PSM	UR	Small tributary streams to large creeks with sandy gravel substrate; Endemic to Cumberlandian Region across northern Alabama.	Yes
Triangular Kidneyshell *Ptychobranchus greenii*	S1		Shoal habitats in small creeks to large rivers, usually in sand and gravel substrates; Endemic to Mobile Basin upstream of Fall Line.	Yes
Tuberculed Blossom (pearlymussel) ***Epioblasma torulosa***	SX, SP	FE	Riffles or shoals in shallow waters of medium rivers or creeks with sandy gravel substrate and rapid currents; historically found across northern Alabama in Tennessee River.	Yes
Warrier Pigtoe *Pleurobema rubellum*	S1		Found in highly oxygenated, clear streams with moderate flow over sand and gravel substrate; limited to the tributaries of the Sipsey Fork, Winston County, and the North River in Tuscaloosa and	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
			Fayette Counties and its tributary Clear Creek, Fayette County, all in Alabama	
White Heelsplitter *Lasmigona complanata*	S2, PSM		Slower waters of medium streams and rivers, and occasionally in small tributaries; Tennessee River system.	Yes
Insects and Arachnids				
Caddisfly Agapetus hessi	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly *Cheumatopsyche kinlockensis*	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly *Dolophilodes major*	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly *Hydroptila coweetensis*	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly *Neophylax atlanta*	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly ***Neophylax concinnus***	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Neophylax ornatus				
Caddisfly ***Neophylax securis***	S1S2		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly ***Orthotrichia baldufi***	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly ***Platycentropus radiatus***	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly ***Rhyacophila carolae***	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Caddisfly ***Rhyacophila minor***	S1		Aquatic larvae found in benthic habitats in temperate lakes, streams, rivers, seeps, pond, and vernal pools.	Yes
Cave Obligate Beetle ***Batriasymmodes spelaeus***	S3		Caves and subterrestrial habitats in Alabama and Tennessee.	No
Monarch Butterfly ***Danaus plexippus***		FC	Milkweed and flowering plants.	Yes
Pseudoscorpion *Trisetobisium fallax*	S3		Moss, leaf litter, and under stones, logs, or bark.	Yes

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Plants				
Alabama Glade-cress *Leavenworthia alabamica*	S2		Limestone outcrops and cedar glades	No
Alabama Larkspur *Delphinium alabamicum*	S3		Calcareous and prairie woods.	No
Allegheny-spurge *Pachysandra procumbens*	S2S3		Rich woods.	Yes
Bradley's Spleenwort *Asplenium bradleyi*	S2		Crevices on acidic rock outcrops, particularly on steep sandstone cliffs, in exposed, barren areas, sometimes in full sun.	No
Bristle Fern *Trichomanes boschianum*	S3		Rocky seeps.	No
Butler's Quillwort *Isoetes butleri*	S2		Thin, seasonally saturated soil over exposed limestone or dolomite bedrock.	No
Canada Lily *Lilium canadense*	S2		Wet meadows, edges of moist rich woods and forests, streamside flats, bogs, marshes, swamps, and ditches along wet roadsides.	Yes
Carolina Anemone *Anemone caroliniana*	S3		Glades and cedar woodlands.	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Carolina Gentian *Frasera caroliniensis*	S2		Upland savannas, upland woodlands, wooded slopes, limestone and sandstone glades, woodland openings, and small meadows in upland wooded area.	No
Cumberland Rosinweed *Silphium brachiatum*	S2		Rich rocky woods.	No
Duck River Bladderpod *Lesquerella densipila*	S1		Cedar glades with thin soil over limestone, open alluvial sites, stream bottoms, fallow fields	No
Dutchman's Breeches *Dicentra cucullaria*	S2		Forest floors, rocky woods, slopes, ledges, valleys, ravines and along stream	No
Dwarf Filmy-fern *Trichomanes petersii*	S2		Rocky seeps.	No
Eggert's Sunflower *Helianthus eggertii*	S2	DM	Barrens and roadsides.	Yes
Eggleston's Violet *Viola egglestonii*	S1		Limestone cedar glades.	No
Elliott's Fan-petal *Sida elliottii*	S3		Disturbed sites, stream banks, grasslands, open, shrubby areas, prefers sandy soil.	Yes
Fleshy-fruit Gladecress *Leavenworthia crassa*	S2	FE	Limestone outcroppings with exposed rock and shallow soil.	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Gattinger's Prairie Clover *Dalea gattingeri*	S3		Dry, calcareous, rocky limestone glades	No
Glade Beardtongue *Penstemon tenuiflorus*	S2S3		Limestone glades and woodlands.	No
Golden Seal *Hydrastis canadensis*	S2		Mesic hardwood forests.	No
Goldie's Woodfern *Dryopteris goldiana*	S1		Hardwood forest, ravines, along streams, swamp and seep edges.	Yes
Gorge Filmy Fern *Hymenophyllum tayloriae*	S1		Moist rockhouses.	No
Harper's Grooved-yellow Flax *Linum sulcatum var. harperi*	S1		Gravel hill prairies, gravel prairies, gravelly slopes along rivers, loess hill prairies, sandy hill prairies, upland sand prairies, and limestone glades.	No
Harper's Umbrella Plant *Eriogonum harperi*	S1		Rocky bluffs.	No
Lake Cress *Armoracia lacustris*	S1		Quiet water, springs, lakes and sluggish, slow-moving streams, and muddy shores.	No
Large Whorled Pogonia *Isotria verticillata*	S2		Mesic to dry forests and woodlands, and occasionally in bogs.	Yes

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Leafy Prairie Clover *Dalea foliosa*	S1	FE	Rocky washes in glades.	No
Limestone Adder's-tongue *Ophioglossum engelmannii*	S3		Dry barrens and glades in calcareous areas.	No
Limestone Fame-flower *Phemeranthus calcaricus*	S2		Glades.	No
Little Mountain Meadowrue *Thalictrum mirabile*	S2		Wet sandstone bluffs, sinks, and rocky crevices.	No
Log Fern *Dryopteris celsa*	S2		Moist woods and swamps.	Yes
Lyrate Bladderpod *Paysonia lyrata*	S1		Open cedar glades and other open habitat, such as pastures, often with red-colored and limestone-derived soils.	No
Lyre-leaf Bladderpod *Lesquerella lyrata*		FT	Open cedar glades and other open habitat, such as pastures, often with red-colored and limestone-derived soils.	No
Menge's Fame-flower *Phemeranthus mengesii*	S3		Dry rock ledges.	No
Michaux Leavenworthia *Leavenworthia uniflora*	S2		Rocky ledges, cedar glades, pastures, roadsides, old fields, thin soil on limestone beds, seeps on limestone rubble.	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Mountain Camellia *Stewartia ovata*	S2S3		Forest understory or at the edges of openings along streams.	Yes
Narrow-leaved Glade Fern *Diplazium pycnocarpon*	S1S2		Rich, moist, deciduous forest, wooded bluffs.	Yes
Nashville Breadroot *Pediomelum subacaule*	S2		Limestone cedar glades.	No
Nodding Trillium *Trillium flexipes*	S2S3		Rich deciduous woodlands, wooded slopes, large shady ravines, and rocky bluffs.	No
Prairie Indian Plantain *Arnoglossum plantagineum*	S1		Moist prairies and marshes.	No
Prairie Trillium *Trillium recurvatum*	S2		Rich woodlands, open woodlands, and savannas, where deciduous trees are dominant.	Yes
Prairie-dock *Silphium pinnatifidum*	S2		Prairies, barrens, and cedar glades.	No
Prices's Potato-Bean *Apios priceana*	S2	FT	Openings in rich woods.	Yes
Puttyroot *Aplectrum hyemale*	S2		Rich, mostly mesic, deciduous woodlands and the lower slopes of moist ravines.	Yes

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Rock Clubmoss *Huperzia porophila*	S1		Moist, sheltered cliffs, usually on sandstone bedrock.	No
Roundleaf Catchfly *Silene rotundifolia*	S1S2		Exposed rocky cliffs and banks.	No
Round-leaved Sundew *Drosera rotundifolia*	S1		Bogs and seeps.	No
Shining Clubmoss *Huperzia lucidula*	S2		Conifer, mixed or hardwood forest, shaded slopes, bogs, and conifer swamps.	No
Soft False Gromwell *Onosmodium molle ssp. molle*	S2		Dry to mesic sandy or gravelly prairies and open woods.	No
Southern Meadowrue *Thalictrum debile*	S2		Moist to dry forests, woodlands, and barrens, over mafic or ultramafic bedrock.	No
Southern Twayblade *Listera australis*	S3		Wet-mesic woods.	Yes
Spring Avens *Geum vernum*	S1		Floodplains and rich woods.	Yes
Sunnybell *Schoenolirion croceum*	S2		Limestone outcrops.	No

Common Name Scientific *Name*	State Rank and Listing Status[1,2]	Federal Listing Status[1]	Habitat Requirements	Potential Habitat Present
Sweet Pinesap *Monotropsis odorata var. odorata*	S1		Piney woods.	Yes
Tennessee Milkvetch *Astragalus tennesseensis*	S1S2		Glades.	No
Water Stitchwort *Stellaria fontinalis*	S1	UR	Seeps and limestone creek beds.	No
Wherry's Phloxy *Phlox pulchra*	S1		Wood margins and wood openings in moderately acid soils.	No
White Trout Lily *Erythronium albidum*	S1S2		Moist woods, on wooded slopes and bluffs, and along streams.	Yes
Yellow Lady's-slipper *Cypripedium pubescens*	S3		Cypripedium parviflorum var. pubescens grows in boggy areas, swampy areas, damp woods, often with a rich layer of humus and decaying leaf litter, near rivers or canal banks.	No
Yellow Sunnybell *Schoenolirion croceum*	S2		Wet areas in glades.	No

E

Appendix E – Biotope Forestry and Environmental Bat Mist-Net Survey Report

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Hillsboro Solar Project presence/absence mist-net surveys for threatened & endangered bat species

REPORT

PRESENTED TO

Harriet Seacat-HDR, Inc.

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BY

BIOTOPE FORESTRY & ENVIRONMENTAL

Nacogdoches, TX| Asheville, NC

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1.0 EXECUTIVE SUMMARY

Biotope Forestry & Environmental (Biotope) completed a presence/probable absence survey for threatened and endangered bat species as a part of the Section 7 Endangered Species Act requirements for the proposed Hillsboro Solar Project (Project) in Lawrence County, Alabama. The Project area of interest (AOI) consists of 908 acres and one linear kilometer of potential summer habitat for target species (i.e., trees greater than three inches diameter at breast height (DBH)) to be cleared for the construction of a solar farm. The level of effort was based upon the limits of disturbance (LOD), which comprises approximately 908 acres of non-linear habitat and one kilometer of linear habitat.

Biotope was contracted in June 2023 by HDR to conduct a mist-net survey to determine presence/probable absence of the Indiana bat (*Myotis* sodalis), northern long-eared bat (*Myotis septentrionalis*), tricolored bat (*Perimyotis subflavus*), and little brown bat (*Myotis lucifugus*) for the Project. The survey was conducted within the Project AOI on the nights of August 1st through August 12th, 2023. Forested acreage onsite was primarily comprised of upland mature pine- hardwood forest interspersed with early successional habitat and agricultural land. Predominant canopy species were *Quercus falcata, Quercus phellos, Liquidambar styraciflua, Acer rubrum, and Pinus taeda*.

Summer roosting habitat located within the proposed AOI was generally observed to be of good quality. Early successional trees species displaying cavities and/or trees displaying sloughing bark were observed onsite as well as foraging areas (e.g., canopy gaps, open fields, and pond water source). Main flight corridors consisted of forest interior openings, old forest trails, and edges created by agricultural development.

Eight mist-net sites were surveyed with five mist-nets for two calendar nights, totaling ten mist-net nights per site. One linear mist-net site was surveyed with two mist-nets for two calendar nights, totaling four mist-net nights. Mist-nets were established along primary corridors, interior forest, across streams, and on the forest edges within the AOI to maximize bat captures. A total of 41 individual bats consisting of five species were captured. Eight big brown bats (*Eptesicus fuscus*), 28 eastern red bats (*Lasiurus borealis*), two evening bats (*Nycticeius humeralis*), two gray bats (*Myotis grisescens*), and one tricolored bat (*Perimyotis subflavus*) were captured. No Indiana bats (*Myotis sodalis*) or northern long-eared bats (*Myotis septentrionalis*) were documented. Survey results suggest that these species are not utilizing the project area.

A probable absence determination was made with regards to the federally listed Indiana and northern long-eared bats. These results suggest that project development will not cause direct or indirect adverse effects to these species. However, since tricolored bats were captured on the project area, Biotope recommends following the Guidelines regarding the tree clearing buffers at tricolored bat capture sites and roost trees. This would result in a 1.5-mile buffer around each roost tree. The site contained no apparent rock outcroppings, caves, or mine portals that might suggest possible winter habitat within the AOI. Biotope recommends coordination with HDR, the Tennessee Valley Authority (TVA), the Alabama Department of Conservation and Natural Resources (ACDNR) and the United States Fish and Wildlife Service (USFWS) for concurrence with the findings of this survey.

2.0 INTRODUCTION

Biotope was contracted by HDR to assess the status of the federally endangered Indiana bat and northern long-eared bat for the proposed Hillsboro Solar Project in Lawrence County, Alabama. Tricolored bats and little brown bats were also considered target species for the purposes of this project. Biotope is submitting this bat survey report to fulfill the requirements set forth by the ACDNR and for the permitting process to fulfill Section 7 Endangered Species Act requirements set forth by the USFWS.

3.0 PROJECT LOCATION

The project area is located approximately 0.15 miles north of Wheeler, Alabama. The approximate center of the project area is located at 34.663257° -87.246355°. The proposed project covers approximately 908 acres (non-linear) and one kilometer (linear) of forested habitat with trees greater than three inches DBH, which is suitable summer habitat for the target bat species. The land use within and surrounding the project area is primarily forest, roads, agriculture, and residential areas. The topography in the project area is characterized as gently sloping with elevations ranging between 570-620 feet above sea level. Project maps can be found in Appendix A.

4.0 METHODS

4.1 Mist-net Locations

The level of survey effort required was based on the LOD that contained potential Indiana bat and northern long-eared bat habitat within the project area and the requirements dictated in the USFWS *2023 Indiana Bat & Northern Long-eared Bat Survey Guidelines* (Guidelines). Eight non-linear summer mist-net surveys were conducted for two calendar nights, totaling 10 net nights of survey effort per mist-net site. One linear summer mist-net survey was conducted for two calendar nights, totaling four net nights of survey effort. Surveys were conducted from August 1st-August 12th, 2023. Survey methods strictly adhered to the guidance set forth by the Guidelines.

Mist-net sets were spaced at least 100 feet (30 meters) apart, so as not to interfere with each other, and evenly distributed throughout suitable habitat to prevent over-sampling individual habitat features (e.g., three or more mist-net sets on a single travel corridor or stream). Net locations were selected in areas that provided preferred habitat for Indiana bats and northern long-eared bats where available. Preferred habitat includes potential travel corridors (e.g., forest interior corridors, water sources, forest edge). Nets filled corridors from side to side, extending beyond the corridor boundaries when possible, and from ground level up to the overhanging canopy where possible. When nets were placed over water, nets were slightly raised above the surface of the water so that captured bats did not get wet. Surveys were conducted using black nylon mist-nets (38mm mesh) ranging from 5.2m to 7.8m high, consisting of two or more nets stacked on top of one another, and from 4m to 18m in length.

4.2 Survey Period

Nets were opened approximately 10 minutes before sunset and checked every 10 minutes for at least five hours. Care was taken to minimize noise, lights, and movement near the nets. Biologists were prepared to cut the net if a bat became severely entangled and could not be safely extracted within four minutes. Surveys were not conducted in adverse weather conditions including: (a) temperatures below 50°F (10°C) during the survey period; (b) precipitation that exceeded 30 minutes either continuously or intermittently during the survey, and (c) sustained wind speeds greater than nine miles/hour for more than 30 minutes during the survey period.

4.3 Morphological Data Collected

The capture time, species, age, sex, reproductive condition, right forearm (RFA) length, mass, Reichard's wing damage index score, net ID, and net capture height were recorded for all bats captured. If any bats were captured with existing wing bands, the number was recorded. Additionally, band number and transmitter frequency (if applicable) that were newly affixed to each captured threatened or endangered bat was recorded. Bat identification was performed by a qualified state and federally permitted bat biologist. Completed data sheets can be found in Appendix B.

4.4 White-Nose Syndrome

To minimize the potential transmission of white-nose syndrome to captured bats, all netting and field activities followed the most recent decontamination protocols (October 2020) set forth by the USFWS. All disposable scientific equipment (bags and exam gloves) were used on only one bat then discarded. All submersible equipment (mist-nets and ropes) were fully immersed in hot water that maintained a temperature of at least 55°C (131°F) for a minimum of five minutes on a nightly basis. All non-submersible equipment (rulers, calipers, and scales) was wiped down with Lysol® IC Quaternary Disinfectant Cleaner Wipes after each use between bats while mist-net set poles were wiped down at the end of each night.

4.5 Habitat Assessment

Biologists followed methods set forth by the USFWS while conducting habitat assessment of the AOI. Field reconnaissance was conducted throughout the entirety of the project area before initiation of the survey to determine the highest quality net site locations.

A. Summer Habitat

To assess the project area for potential summer habitat, biologists conducted a desktop review of the AOI. The most recent aerial photography was used to delineate non-forested and forested areas within the AOI and to determine the distance to available water sources. The onsite habitat assessment involved the characterization of forest cover types near net sites, including overall composition (i.e., species, successional stage, etc.) and qualitative assessment of habitat suitability (i.e., potential roost trees, riparian/upland corridors, forest understory clutter, etc.).

B. Winter Habitat

To determine if potential winter habitat was present within the permit area, qualified biologists reviewed maps depicting karst occurrence, mining history, and environmental resource to determine if any open abandoned mines or karst areas were present within or adjacent to the AOI.

4.6 Radio Telemetry

Indiana bats, northern long-eared bats, tricolored bats, and little brown bats were all considered target species for radio telemetry. When searching for a roost tree, biologists used an omni directional antenna attached to the top of a vehicle to scan the perimeters of the proposed project area. Biologists would exit the vehicle at strategic high points and utilize a 5-element antenna attached to an Advanced Telemetry Systems R410 receiver to increase the chances of picking up a signal. Once a signal was obtained, biologists would track the bat on foot to its diurnal roost location. Tagged bats were radio tracked for a total of seven days each, either until the diurnal roost was successfully located or a minimum of four hours.

When a roosting structure was located and flagged, coordinates and all roost measurements were recorded. Roost identification and measurements included, but were not limited to, tree species identification, DBH, and the total height of the roost structure. Two emergence count surveys were conducted for each identified roost tree.

4.7 Emergence Count Surveys

Per the Guidelines, two nights of emergence count surveys were conducted at each diurnal roost tree identified during the tracking period to enumerate bat use of the roost. Surveys began 30 minutes before dusk and continued until at least one hour after sunset or until the roost tree was no longer visible without additional illumination. Surveys were only conducted under optimal weather conditions (i.e., no adverse weather conditions as described for mist-netting).

5.0 RESULTS

5.1 Bat Captures

A total of 41 individual bats consisting of five species were captured (Table 1). Eight big brown bats (*Eptesicus fuscus*), 28 eastern red bats (*Lasiurus borealis*), two evening bats (*Nycticeius humeralis*), two gray bats (*Myotis grisescens*), and one tricolored bat (*Perimyotis subflavus*) were captured. No Indiana bats (*Myotis sodalis*) or northern long-eared bats (*Myotis septentrionalis*) were documented. Survey results suggest that these species are not utilizing the project area. Data sheets can be found in Appendix B.

Table 1. Summary table of all bats captured during presence/probable absence mist-net surveys conducted on the Hillsboro Project area.

Species	Sex	Age	Reproductive Condition	Number of Captures
Eptesicus fuscus	Female	Adult	Pregnant	2
Eptesicus fuscus	Female	Adult	Lactating	2
Eptesicus fuscus	Female	Adult	Non-reproductive	3
Eptesicus fuscus	Unknown	Unknown	Unknown	1
Lasiurus borealis	Female	Adult	Post-lactating	3
Lasiurus borealis	Female	Adult	Non-reproductive	2
Lasiurus borealis	Male	Adult	Scrotal	1
Lasiurus borealis	Female	Juvenile	Non-reproductive	8
Lasiurus borealis	Male	Juvenile	Non-reproductive	8
Lasiurus borealis	Unknown	Unknown	Unknown	6
Nycticeius humeralis	Male	Adult	Scrotal	2
Myotis grisescens	Female	Adult	Non-reproductive	1
Myotis grisescens	Male	Adult	Scrotal	1
Perimyotis subflavus	Female	Adult	Lactating	1

5.2 Radio Telemetry

On August 3rd, 2023, one female tricolored bat was captured at mist-net site HS-03 and affixed with a radio transmitter (frequency 172.577). To prevent the combined weight of the transmitter and band package from exceeding 5% of her body weight, which can have adverse impacts on the bats ability to survive, no forearm band was applied. Radio tracking efforts began the following morning (August 4th) and continued for seven consecutive days. During this time, three diurnal roost trees were identified in the same general area between 50 and 250 meters east of mist-net site HS-03.

Roost 172577_R1 was located on August 4th, 2023, and identified as a live sweetgum tree (*Liquidambar styraciflua*). The diameter at breast height was 17 inches (43.2 centimeters) and the total height was 95 feet (28.9 meters). The roost was believed to be approximately 50 feet (15.2 meters) high in the tree in a leaf cluster.

Roost 172577_R2 was located on August 5th, 2023, and identified as a live sweetgum tree. The diameter at breast height was two inches (5.1 cm) and the total height was 17 feet (5.2 meters). The bat was observed in a dead leaf cluster eight feet (2.4 meters) high. A severe storm downed this tree the day it was discovered, removing it as a potential diurnal roost tree for the future and eliminating the possibility of emergence count surveys.

Roost 172577_R3 was located on August 6th, 2023, and identified as a live post oak tree (*Quercus stellata*). The diameter at breast height was eight inches (20.3 cm) and the total height was 55 feet (16.8 meters). The roost was believed to be approximately 15 feet (4.6 meters) high in the tree in a dense leaf cluster. The tricolored bat returned to this roost each night for the remainder of the radio tracking efforts.

5.3 Emergence Count Surveys

A total of four emergence count surveys were conducted on the diurnal roost trees that were not downed by storms. Two emergence counts were conducted per roost tree. The tricolored bat appeared to prefer small leaf clusters as a roost location, which would explain the low number of bats seen during these surveys. Diurnal roost tree 172577_R2 was downed the evening it was discovered by a severe storm; therefore, emergence counts were not able to be conducted on this diurnal roost.

Table 2. Summary table of all bats observed during emergence surveys on roost trees located during the presence/probable absence mist-net surveys conducted on the Hillsboro Project area.

Roost Tree ID	Emergence Survey Date	Bat Count
172577_R1	08/04/2023	2
	08/08/2023	0
172577_R2[1]	N/A	N/A
	N/A	N/A
172577_R3	08/06/2023	1
	08/07/2023	1

[1]Note that a storm removed 172577_R2 before emergence surveys could be performed.

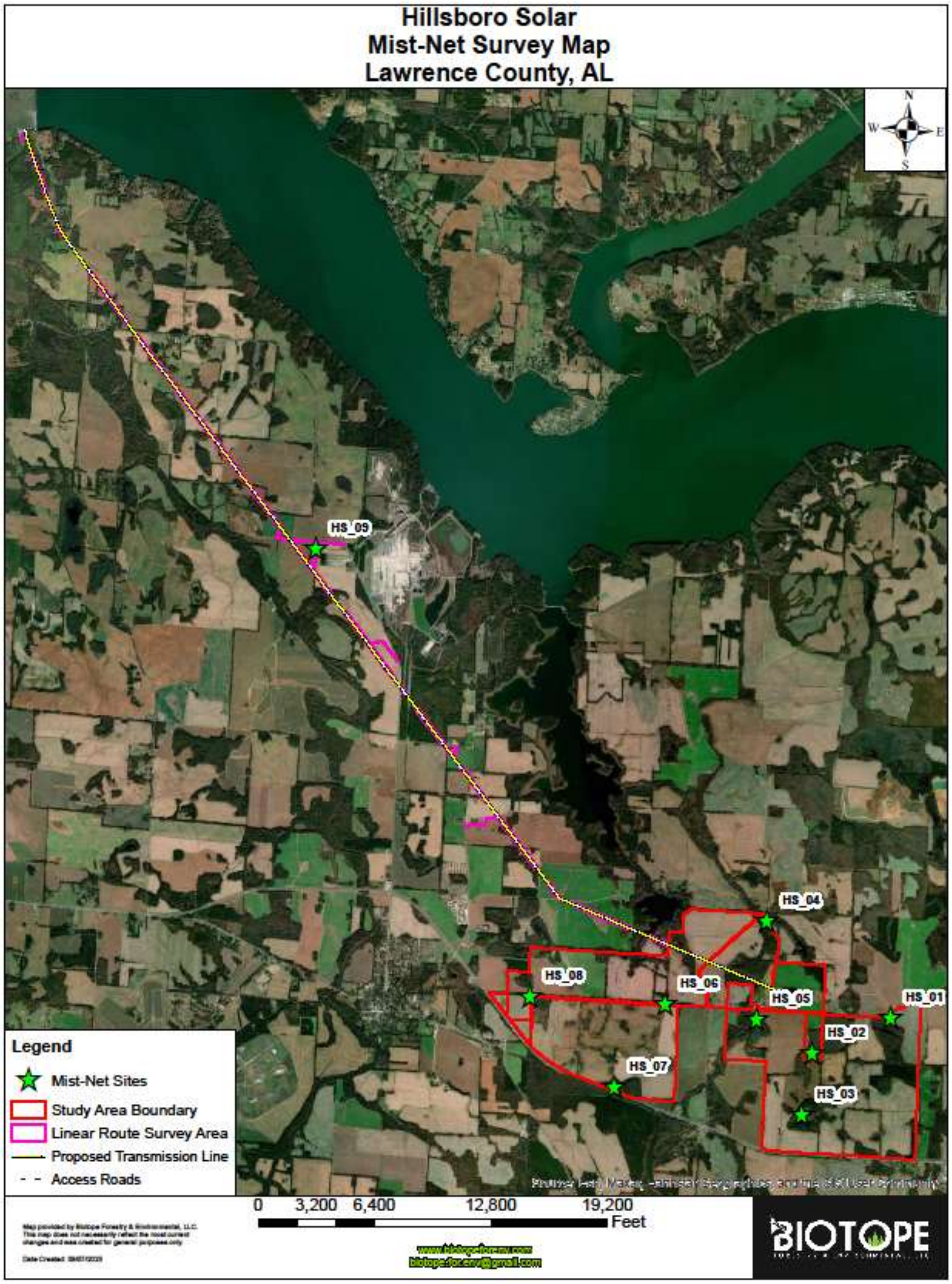
6.0 DISCUSSION

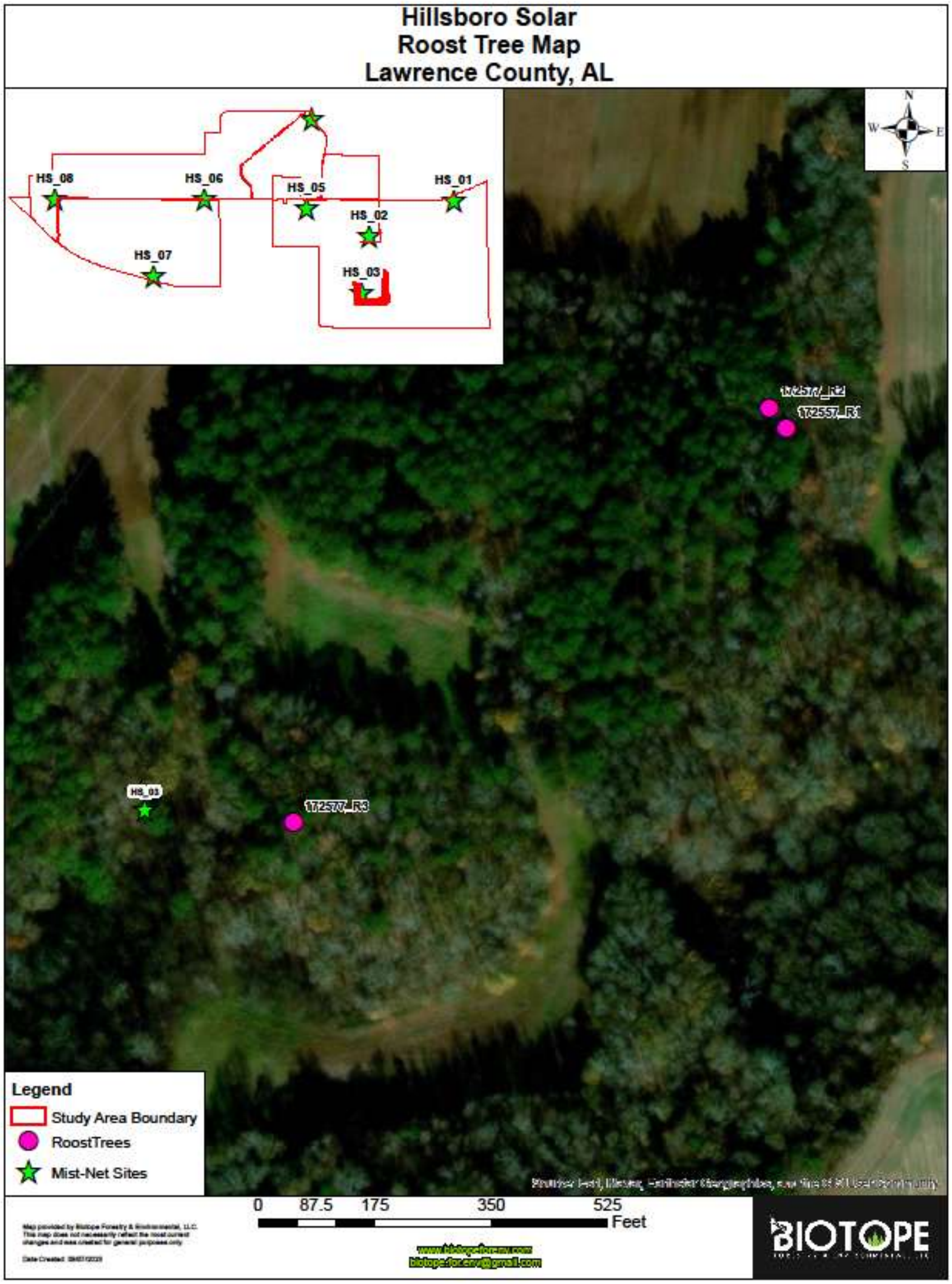
Mist net surveys were conducted at the proposed Hillsboro Solar Project from August 1st- August 12th, 2023. Surveys were conducted at the request of HDR due to the proposed removal of trees outside of the winter tree clearing period (November 15 - March 31). The mist-net survey was conducted with the USFWS required level of effort and under the appropriate conditions (e.g., ambient temperature >50°F) to effectively investigate presence/absence of Indiana bats and northern long-eared bats. No Indiana bats or northern long-eared bats were documented. The results of this survey indicate that the project will not likely adversely affect Indiana bat and northern long-eared bat populations in the area.

However, since a tricolored bat was captured on the project area, Biotope recommends following the Guidelines regarding the tree clearing buffers at tricolored bat capture sites and roost trees. In preparation for the listing of the tricolored bat as endangered, USFWS recommends a 1.5-mile buffer be placed around each roost tree. Since the tagged bat was successfully tracked to diurnal roost tree locations, the larger buffer around the capture site is not required. Biotope recommends coordination with HDR, TVA, ACDNR and USFWS for concurrence with the findings of this survey.

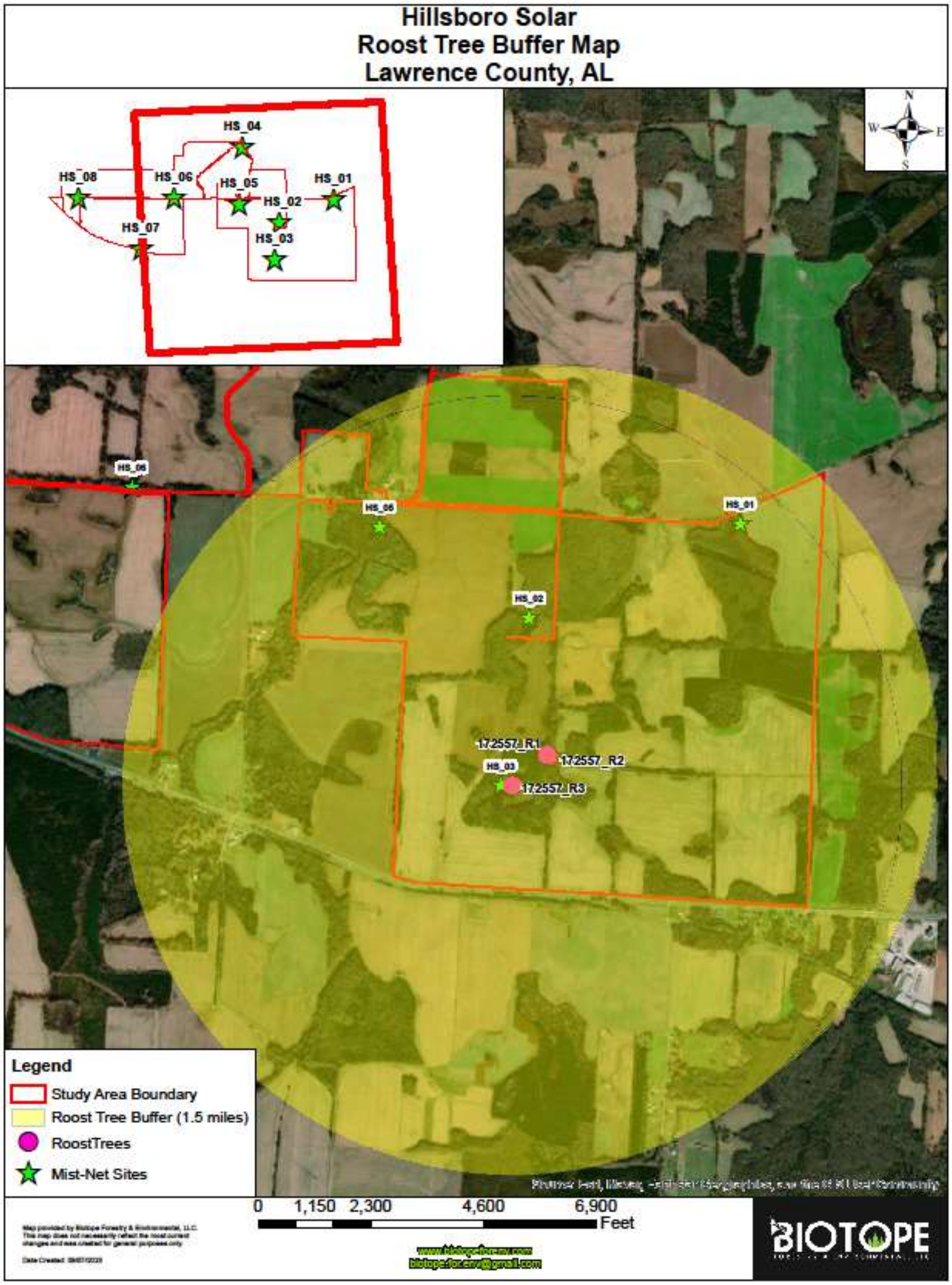
APPENDIX A

Project Maps





Hillsboro Solar
Roost Tree Map
Lawrence County, AL
N
W
E
S
HS_08
HS_06
HS_05
HS_01
HS_02
HS_07
HS_03
172557_R1
HS_03
172577_R3
Legend
Study Area Boundary
RoostTrees
Mist-Net Sites
0
87.5
175
350
525
Feet
BIOTOPE


Hillsboro Solar
Roost Tree Buffer Map
Lawrence County, AL
HS_01
HS_02
HS_03
HS_04
HS_05
HS_06
HS_07
HS_08
172557_R1
172557_R2
172557_R3
Legend
Study Area Boundary
Roost Tree Buffer (1.5 miles)
RoostTrees
Mist-Net Sites
0
1,150
2,300
4,600
6,900
Feet
BIOTOPE

APPENDIX B
Completed Data Sheets

BIOTOPE FORESTRY & ENVIRONMENTAL, LLC

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/8/2023	Biotope Forestry & Environmental	Grant Maltba	Luke Fultz	HS-01	Lawrence	34.670516	-87.216979	Deciduous woodlot surrounded by agriculture fields.	620	Flat terrain. Small woodlot surrounded by agricultural fields. Dominant tree species include: *Celtis occidentalis* , *Quercus falcata* , *Quercus phellos* , *Quercus stellata*, and *Liquidambar styraciflua* , with *Morus rubra* and *Juniperus virginiana* and some saplings of the aforementioned dominant species comprising the midstory and edges.
8/9/2023	Biotope Forestry & Environmental	Grant Maltba	Luke Fultz	HS-01						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	9	2.6	46.8	1-6.2	34.670725°	-87.217805°	Forest corridor	
B	2	6	2.6	31.2	0.5-5.7	34.670622°	-87.217584°	Forest interior	
C	2	6	2.6	31.2	0.5-5.7	34.670421°	-87.217337°	Forest interior	
D	2	6	2.6	31.2	0.5-5.7	34.670631°	-87.217272°	Forest interior and edge	
E	2	6	2.6	31.2	1-6.2	34.670516°	-87.216979°	Opening in treeline between agricultural fields	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/8/2023	1	21:00	Grant Maltba	A	2.5	EPFU	F	A	PG	22	47	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/8/2023	2	21:30	Grant Maltba	A	3	LABO	U	U	U	U	U	U	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	escaped net upon approach during net
8/8/2023	3	22:17	Grant Maltba	A	2.5	EPFU	F	A	PG	22	47	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	recapture
8/8/2023	4	22:50	Grant Maltba	E	3	MYGR	F	A	NR	12	45	1	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	Yes	HS01_MYGR_1	
8/9/2023	5	20:45	Grant Maltba	A	2	LABO	M	A	SCR	11	38	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/9/2023	6	21:15	Grant Maltba	A	4.5	LABO	U	U	U	U	U	U	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	escaped net as net was being lowered
8/9/2023	7	21:46	Grant Maltba	A	4	LABO	F	J	NR	9.5	36	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/9/2023	8	22:15	Grant Maltba	A	3	LABO	M	J	NR	10	38	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/9/2023	9	22:25	Grant Maltba	A	3	LABO	M	J	NR	10	38	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	recapture
8/9/2023	10	22:35	Grant Maltba	A	5	LABO	F	J	NR	9	37	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/8/2023	19:47	73.3	Mostly Cloudy	Calm
8/8/2023	20:17	72.4	Mostly Cloudy	Calm
8/8/2023	20:47	72.2	Mostly Cloudy	Calm
8/8/2023	21:17	71.5	Partly Cloudy	Slight Breeze
8/8/2023	21:47	70.3	Clear	Calm
8/8/2023	22:17	70.2	Mostly Cloudy	Slight Breeze
8/8/2023	22:47	69.9	Partly Cloudy	Calm
8/8/2023	23:17	69.5	Clear	Slight Breeze
8/8/2023	23:47	69.2	Clear	Slight Breeze
8/8/2023	0:17	69.0	Clear	Calm
8/8/2023	0:47	68.5	Clear	Calm
8/9/2023	19:46	70.3	Partly Cloudy	Gentle Breeze
8/9/2023	20:16	69.9	Mostly Cloudy	Gentle Breeze
8/9/2023	20:46	69.4	Partly Cloudy	Gentle Breeze
8/9/2023	21:16	69.2	Cloudy	Slight Breeze
8/9/2023	21:46	69.8	Mostly Cloudy	Gentle Breeze
8/9/2023	22:16	70.7	Mostly Cloudy	Gentle Breeze
8/9/2023	22:46	71.0	Mostly Cloudy	Slight Breeze
8/9/2023	23:16	71.2	Mostly Cloudy	Slight Breeze
8/9/2023	23:46	71.8	Cloudy	Gentle Breeze
8/9/2023	0:16	72.4	Cloudy	Gentle Breeze
8/9/2023	0:46	73.1	Cloudy	Gentle Breeze

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/6/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-02	Lawrence	34.66465	-87.230855	Hardwood/Pine forest with corridor running through.	500	Mature bottomland hardwood forest surrounded by agricultural fields. Closed canopy with open understory. *Quercus falcata* , *Liquidambar styraciflua* , *Fraxinus pennsylvanica* , *Carya glabra* .
8/7/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-02						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	12	2.6	62.4	1.5-6.7	34.664755°	-87.230805°	Edge of forest habitat	
B	2	9	2.6	46.8	1.5-6.7	34.664818°	-87.231429°	Edge of forest habitat	
C	2	6	2.6	31.2	0.5-5.7	34.664717°	-87.230423°	Closing off entrance to forest from field	
D	2	6	2.6	31.2	0.5-5.7	34.664508°	-87.230731°	Closing off entrance to forest from field	
E	2	9	2.6	46.8	1.5-6.7	34.665062°	-87.230461°	Forest interior	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/6/2023	1	20:45	Eli Corwin	A	4	LABO	F	J	NR	10	38	0	No	[redacted]				N/A	No	[redacted]	
8/7/2023	No bats																				

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/6/2023	19:48	82	Clear	Calm
8/6/2023	20:18	81	Clear	Calm
8/6/2023	20:48	78	Clear	Calm
8/6/2023	21:18	76	Clear	Calm
8/6/2023	21:48	75	Clear	Calm
8/6/2023	22:18	75	Clear	Calm
8/6/2023	22:48	75	Clear	Calm
8/6/2023	23:18	75	Clear	Calm
8/6/2023	23:48	75	Partly Cloudy	Gentle Breeze
8/6/2023	0:18	74	Partly Cloudy	Gentle Breeze
8/6/2023	0:48	74	Partly Cloudy	Gentle Breeze
8/7/2023	19:46	78	Partly Cloudy	Calm
8/7/2023	20:16	76	Partly Cloudy	Calm
8/7/2023	20:46	75	Partly Cloudy	Calm
8/7/2023	21:16	74	Partly Cloudy	Calm
8/7/2023	21:46	73	Clear	Calm
8/7/2023	22:16	73	Clear	Calm
8/7/2023	22:46	73	Clear	Calm
8/7/2023	23:16	72	Clear	Calm
8/7/2023	23:46	72	Clear	Calm
8/7/2023	0:16	71	Clear	Calm
8/7/2023	0:46	71	Clear	Calm

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Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/3/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-03	Lawrence	34.655223	-87.232139	Hardwood/Pine forest with corridor running through.	550	Mature bottomland mixed pine and hardwood forest surrounded by agricultural fields. Closed canopy with open understory. *Quercus falcata*, *Liquidambar styraciflua*, *Pinus taeda*, *Carya glabra*.
8/4/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-03						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	9	2.6	46.8	1-6.2	34.654505°	-87.231833°	Entrance from field to corridor	
B	2	6	2.6	31.2	1-6.2	34.654981°	-87.231985°	Closing off corridor	
C	2	9	2.6	46.8	0.5-5.7	34.655183°	-87.23225°	Interior of forest	
D	2	6	2.6	31.2	0.5-5.7	34.65556°	-87.23193°	Closing off entrance to corridor	PESU capture
E	2	12	2.6	62.4	1.5-6.7	34.656092°	-87.232269°	Edge of forest habitat	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/3/2023	1	20:15	Eli Corwin	D	3	EPFU	F	A	L	17	48	0	No	[redacted]				N/A	Yes	HS03_EPFU1	
8/3/2023	2	20:15	Eli Corwin	A	2	EPFU	F	A	NR	16	46	0	No	[redacted]				N/A	No	[redacted]	
8/3/2023	3	20:20	Eli Corwin	D	3	EPFU	F	A	NR	17	47	0	No	[redacted]				N/A	No	[redacted]	
8/3/2023	4	21:05	Eli Corwin	B	1	EPFU	F	A	L	19	47	0	No	[redacted]				N/A	No	[redacted]	
8/3/2023	5	21:50	Eli Corwin	D	3	PESU	F	A	L	6.5	33	0	No	[redacted]				172.577	Yes	HS03_PESU_577	Bat last detected North East of capture site.

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/3/2023	19:50	81	Partly Cloudy	Calm
8/3/2023	20:20	80	Partly Cloudy	Calm
8/3/2023	20:50	79	Mostly Cloudy	Calm
8/3/2023	21:20	77	Mostly Cloudy	Calm
8/3/2023	21:50	76	Mostly Cloudy	Calm
8/3/2023	22:20	75	Mostly Cloudy	Calm
8/3/2023	22:50	74	Mostly Cloudy	Calm
8/3/2023	23:20	74	Mostly Cloudy	Calm
8/3/2023	23:50	73	Mostly Cloudy	Calm
8/3/2023	0:20	73	Mostly Cloudy	Calm
8/3/2023	0:50	73	Mostly Cloudy	Calm
8/4/2023	19:50	81	Clear	Calm
8/4/2023	20:20	80	Clear	Calm
8/4/2023	20:50	79	Clear	Calm
8/4/2023	21:20	77	Clear	Calm
8/4/2023	21:50	76	Clear	Calm
8/4/2023	22:20	75	Clear	Calm
8/4/2023	22:50	74	Clear	Calm
8/4/2023	23:20	74	Clear	Calm
8/4/2023	23:50	73	Clear	Calm
8/4/2023	0:20	73	Clear	Calm
8/4/2023	0:50	73	Clear	Calm

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/8/2023	Biotope Forestry & Environmental	Wes Webb	Eric Schicker	HS-04	Lawrence	34.683995	-87.240386	Forested stream, interior forest	0	Relatively flat, agricultural fields, fragmented deciduous forests; *Platinus occidentalis*, *Celtis occidentalis*, *Acer negundo*, *Juglans nigra*.
8/9/2023	Biotope Forestry & Environmental	Wes Webb	Eric Schicker	HS-04						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	9	2.6	46.8	0.5 - 5.5	34.683707°	-87.240359°	Interior forest	
B	2	4	2.6	20.8	1.0 - 6.0	34.683472°	-87.241091°	Stream	
C	2	6	2.6	31.2	1.0 - 6.0	34.683969°	-87.240676°	Stream	Separate stream channel than HS4B and HS4D
D	2	6	2.6	31.2	1.0 - 6.0	34.683986°	-87.241230°	Stream	
E	2	4	2.6	20.8	0.5 - 5.5	34.684531°	-87.241299°	Interior forest	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/8/2023	No bats																				No bats HS-4 8 August
8/9/2023	No bats																				No bats HS-4 9 August

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/8/2023	19:50	75	Mostly Cloudy	Calm
8/8/2023	20:20	73	Mostly Cloudy	Calm
8/8/2023	20:50	72	Mostly Cloudy	Calm
8/8/2023	21:20	72	Partly Cloudy	Calm
8/8/2023	21:50	71	Clear	Calm
8/8/2023	22:20	70	Mostly Cloudy	Calm
8/8/2023	22:50	70	Partly Cloudy	Calm
8/8/2023	23:20	69	Clear	Calm
8/8/2023	23:50	69	Clear	Calm
8/8/2023	0:20	69	Clear	Calm
8/8/2023	0:50	68	Clear	Slight Breeze
8/9/2023	19:50	71	Partly Cloudy	Gentle Breeze
8/9/2023	20:20	70	Mostly Cloudy	Gentle Breeze
8/9/2023	20:50	69	Partly Cloudy	Gentle Breeze
8/9/2023	21:20	69	Cloudy	Slight Breeze
8/9/2023	21:50	70	Mostly Cloudy	Slight Breeze
8/9/2023	22:20	70	Mostly Cloudy	Slight Breeze
8/9/2023	22:50	71	Mostly Cloudy	Gentle Breeze
8/9/2023	23:20	71	Mostly Cloudy	Gentle Breeze
8/9/2023	23:50	72	Cloudy	Slight Breeze
8/9/2023	0:20	72	Cloudy	Slight Breeze
8/9/2023	0:50	73	Cloudy	Slight Breeze

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/11/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-05	Lawrence	34.66925	-87.241268	Forested edge of agricultural field and forest interior with creek	0	Semi mature bottomland hardwood forest surrounded by agricultural fields. Closed canopy with open understory. Two meter wide creek running through forest interior. Tree species are *Fraxinus pennsylvanica*, *Acer rubrum* and *Liquidambar styraciflua*.
8/12/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-05						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	12	2.6	62.4	1.5-6.7	34.668107°	-87.2391°	Edge of forest and field	
B	2	9	2.6	46.8	1.5-6.7	34.66963°	-87.241043°	Edge of forest and field	Gray bat capture
C	2	6	2.6	31.2	1.5-6.7	34.668995°	-87.240215°	Entrance to forest from field	
D	2	9	2.6	46.8	1-6.2	34.668676°	-87.240091°	Creek in forest interior	
E	2	6	2.6	31.2	1-6.2	34.669193°	-87.240857°	Creek in forest interior	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/11/2023	1	22:27	Eli Corwin	A	2	LABO	F	A	PL	14	44	0	No	[redacted]				N/A	No	[redacted]	
8/11/2023	2	22:55	Eli Corwin	B	2	MYGR	M	A	SCR	11	44	0	No	[redacted]				N/A	Yes	HS05_MYGR1_1	
8/12/2023	3	20:25	Eli Corwin	B	2.5	LABO	U	U	U	U	U	U	No	[redacted]				N/A	No	[redacted]	Escape
8/12/2023	4	21:30	Eli Corwin	B	2	LABO	F	A	PL	13	43	0	No	[redacted]				N/A	No	[redacted]	
8/12/2023	5	22:40	Eli Corwin	A	3	EPFU	U	U	U	U	U	U	No	[redacted]				N/A	No	[redacted]	Escape

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/11/2023	19:43	82	Mostly Cloudy	Calm
8/11/2023	20:13	81	Partly Cloudy	Calm
8/11/2023	20:43	80	Clear	Calm
8/11/2023	21:13	79	Clear	Calm
8/11/2023	21:43	79	Clear	Calm
8/11/2023	22:13	78	Clear	Calm
8/11/2023	22:43	77	Clear	Calm
8/11/2023	23:13	76	Clear	Calm
8/11/2023	23:43	75	Clear	Calm
8/11/2023	0:13	75	Clear	Calm
8/11/2023	0:43	75	Clear	Calm
8/12/2023	19:42	81	Clear	Calm
8/12/2023	20:12	80	Clear	Calm
8/12/2023	20:42	79	Clear	Calm
8/12/2023	21:12	79	Clear	Calm
8/12/2023	21:42	78	Partly Cloudy	Calm
8/12/2023	22:12	78	Partly Cloudy	Calm
8/12/2023	22:42	77	Clear	Calm
8/12/2023	23:12	77	Partly Cloudy	Calm
8/12/2023	23:42	76	Clear	Calm
8/12/2023	0:12	75	Clear	Calm
8/12/2023	0:42	74	Clear	Calm

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/8/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-06	Lawrence	34.670703	-87.258106	Forested edge of agricultural field with a road and forested corridor	10	Mature bottomland hardwood forest surrounded by agricultural fields. Closed canopy with open understory. *Quercus falcata* , *Liquidambar styraciflua* , *Maclura pomifera* .
8/9/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-06						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	12	2.6	62.4	1.5-6.7	34.670724°	-87.257611°	Edge of forest habitat	
B	2	12	2.6	62.4	1.5-6.7	34.670513°	-87.257353°	Edge of forest habitat, road rut with water	
C	2	6	2.6	31.2	0.5-5.7	34.670541°	-87.258435°	Edge of forest and corn field	
D	2	9	2.6	46.8	0.5-5.7	34.671346°	-87.258035°	Corridor	
E	2	6	2.6	31.2	1.5-6.7	34.671847°	-87.257891°	Corridor	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/8/2023	No bats																				
8/9/2023	No bats																				

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/8/2023	19:45	78	Clear	Calm
8/8/2023	20:15	76	Clear	Calm
8/8/2023	20:45	74	Partly Cloudy	Calm
8/8/2023	21:15	72	Partly Cloudy	Calm
8/8/2023	21:45	72	Clear	Calm
8/8/2023	22:15	72	Clear	Calm
8/8/2023	22:45	72	Clear	Calm
8/8/2023	23:15	71	Clear	Calm
8/8/2023	23:45	71	Clear	Calm
8/8/2023	0:15	70	Clear	Calm
8/8/2023	0:45	69	Clear	Calm
8/9/2023	19:44	74	Partly Cloudy	Gentle Breeze
8/9/2023	20:14	70	Partly Cloudy	Gentle Breeze
8/9/2023	20:44	70	Partly Cloudy	Slight Breeze
8/9/2023	21:14	71	Partly Cloudy	Slight Breeze
8/9/2023	21:44	70	Partly Cloudy	Slight Breeze
8/9/2023	22:14	69	Partly Cloudy	Gentle Breeze
8/9/2023	22:44	68	Partly Cloudy	Gentle Breeze
8/9/2023	23:14	68	Partly Cloudy	Moderate Breeze
8/9/2023	23:44	68	Partly Cloudy	Moderate Breeze
8/9/2023	0:14	70	Partly Cloudy	Moderate Breeze
8/9/2023	0:44	70	Partly Cloudy	Moderate Breeze

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/1/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-07	Lawrence	34.657965	-87.26647	Forested bottomland with a gravel road through the middle.	350	Bottomland hardwood forest with open understory, average DBH 12", dominate tree species are *Acer rubrum*, *Quercus falcata*, *Carya glabra*, and *Ulmus americana*.
8/2/2023	Biotope Forestry & Environmental	Eli Corwin	Lee May	HS-07						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	12	2.6	62.4	1.5-6.7	34.657473°	-87.266496°	Corridor over gravel road	
B	2	6	2.6	31.2	1-6.2	34.657968°	-87.266799°	Opening in forest interior	
C	3	9	2.6	70.2	0-7	34.658666°	-87.266691°	Edge of forest habitat stratching into corn field	
D	2	6	2.6	31.2	0-5.2	34.65829°	-87.266253°	Corridor leading from interior to gravel road	
E	3	9	2.6	70.2	0-7	34.657767°	-87.265207°	Opening in forest interior	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/1/2023	1	20:05	Eli Corwin	A	4	LABO	M	J	NR	13	42	0	No	[redacted]				N/A	Yes	HS07_LABO_1	
8/1/2023	2	20:55	Eli Corwin	A	3	LABO	M	J	NR	11	38	0	No	[redacted]				N/A	No	[redacted]	
8/1/2023	3	21:50	Eli Corwin	C	2	LABO	F	A	NR	12	42	0	No	[redacted]				N/A	No	[redacted]	
8/1/2023	4	0:35	Eli Corwin	C	4	LABO	F	J	NR	10	40	0	No	[redacted]				N/A	No	[redacted]	

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/1/2023	19:51	83	Partly Cloudy	Calm
8/1/2023	20:21	77	Partly Cloudy	Calm
8/1/2023	20:51	76	Partly Cloudy	Calm
8/1/2023	21:21	75	Partly Cloudy	Calm
8/1/2023	21:51	73	Partly Cloudy	Calm
8/1/2023	22:21	73	Partly Cloudy	Calm
8/1/2023	22:51	73	Partly Cloudy	Calm
8/1/2023	23:21	72	Partly Cloudy	Calm
8/1/2023	23:51	71	Partly Cloudy	Calm
8/1/2023	0:21	70	Partly Cloudy	Calm
8/1/2023	0:51	70	Partly Cloudy	Calm
8/2/2023	19:51	81	Clear	Calm
8/2/2023	20:21	80	Clear	Calm
8/2/2023	20:51	79	Clear	Calm
8/2/2023	21:21	78	Clear	Calm
8/2/2023	21:51	78	Partly Cloudy	Calm
8/2/2023	22:21	78	Partly Cloudy	Calm
8/2/2023	22:51	76	Partly Cloudy	Calm
8/2/2023	23:21	76	Mostly Cloudy	Calm
8/2/2023	23:51	76	Cloudy	Calm
8/2/2023	0:21	76	Cloudy	Calm
8/2/2023	0:51	76	Cloudy	Calm

BIOTOPE
FORESTRY & ENVIRONMENTAL, LLC

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/1/2023	Biotope Forestry & Environmental	Jay Deatherage	Cole Deatherage	HS-08	Lawrence	34.670542	87.282119	Wooded buffer areas (dry during the survey period) scattered throughout large agricultural fields.	0	Flat topography surrounding area. Forested areas are dominated by *Quercus phellos* , *Ulmus americana* , and *Morus rubra* . Understory dominated by *Forestiera acuminata* and *Rhus copallinum* .
8/2/2023	Biotope Forestry & Environmental	Jay Deatherage	Cole Deatherage	HS-08						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comment
A	2	6	2.6	31.2	0.5-5.7	34.670936°	-87.282630°	Placed over large puddle on trail running between corn field and wooded area	
B	2	4	2.6	20.8	0-5.2	34.670801°	-87.283068°	Placed inside forest in small interior gap	
C	2	12	2.6	62.4	0-5.2	34.670970°	-87.283440°	Placed along edge, where forest and cornfield meet	
D	2	6	2.6	31.2	0-5.2	34.670751°	-87.282167°	Placed along edge, where forest and cornfield meet, and small forest gap was present	
E	2	6	2.6	31.2	0-5.2	34.670204°	-87.282152°	Place along small forested interior corridor	

Capture Information

Date	Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
8/1/2023	1	20:50	Jay Deatherage	A	2	LABO	U	U	U	U	U	U	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	Escaped Net
8/1/2023	2	21:00	Jay Deatherage	A	1	LABO	U	U	U	U	U	U	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	Escaped Net
8/1/2023	3	21:10	Jay Deatherage	A	2	LABO	M	J	NR	9	40	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	Yes	HS08_LABO_1	
8/1/2023	4	22:00	Jay Deatherage	A	2.5	LABO	M	J	NR	8.5	40	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/1/2023	5	23:20	Jay Deatherage	A	1	LABO	M	J	NR	8.5	40	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/2/2023	6	21:00	Jay Deatherage	A	2	NYHU	M	A	SCR	9.5	37	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	Yes	HS08_NYHU_	
8/2/2023	7	22:25	Jay Deatherage	A	2.5	NYHU	M	A	SCR	9	36	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/2/2023	8	23:00	Jay Deatherage	A	1	LABO	F	A	PL	14.5	41	0	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	
8/2/2023	9	23:00	Jay Deatherage	A	1.5	LABO	U	U	U	U	U	U	No	[redacted]	[redacted]	[redacted]	[redacted]	N/A	No	[redacted]	Escaped Net

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/1/2023	19:51	83	Partly Cloudy	Calm
8/1/2023	20:21	80	Partly Cloudy	Calm
8/1/2023	20:51	78	Partly Cloudy	Calm
8/1/2023	21:21	77	Partly Cloudy	Calm
8/1/2023	21:51	75	Partly Cloudy	Calm
8/1/2023	22:21	75	Partly Cloudy	Calm
8/1/2023	22:51	74	Partly Cloudy	Calm
8/1/2023	23:21	73	Partly Cloudy	Calm
8/1/2023	23:51	73	Partly Cloudy	Calm
8/1/2023	0:21	72	Partly Cloudy	Calm
8/1/2023	0:51	71	Partly Cloudy	Calm
8/1/2023	1:21	71	Partly Cloudy	Calm
8/2/2023	19:51	86	Partly Cloudy	Slight Breeze
8/2/2023	20:21	84	Partly Cloudy	Slight Breeze
8/2/2023	20:51	82	Partly Cloudy	Slight Breeze
8/2/2023	21:21	82	Partly Cloudy	Slight Breeze
8/2/2023	21:51	81	Partly Cloudy	Slight Breeze
8/2/2023	22:21	78	Partly Cloudy	Slight Breeze
8/2/2023	22:51	78	Partly Cloudy	Calm
8/2/2023	23:21	75	Cloudy	Calm
8/2/2023	23:51	75	Cloudy	Calm
8/2/2023	0:21	74	Cloudy	Calm
8/2/2023	0:51	73	Cloudy	Calm
8/2/2023	1:21	73	Cloudy	Calm

Site Information

Survey Date	Company Name	Lead Biologist	Assistants	Site Name	County	Latitude (DD)	Longitude (DD)	Describe area being sampled (e.g., forested stream, forest clearing with stream, etc)	Distance to water (m)	Describe habitat 150 m around site: (topography, forest structure and composition, vegetation including dominant tree species)
8/3/2023	Biotope Forestry & Environmental	Jay Deatherage	Cole Deatherage	HS-09	Lawrence	34.7363248	-87.3260649	Forested buffer area between cotton fields.	2,000	Flat topography dominated by cotton fields and small strips of forested riparian buffers. Forest dominated by *Quercus phellos* , *Quercus nigra* , and *Juniperus virginiana* .
8/4/2023	Biotope Forestry & Environmental	Jay Deatherage	Cole Deatherage	HS-09						

Net Information

Net ID	Count	Length (m)	Height (m)	Total Area (sq. m)	Vertical Extent (m)	Latitude (DD)	Longitude (DD)	Description (e.g., stacked over atv trail)	Comments
A	2	4	2.6	20.8	0.5-5.7	34.737016°	-87.325912°	Placed inside small forest opening with a slight corridor.	
B	2	12	2.6	62.4	0.5-5.7	34.735638°	-87.325994°	Placed along edge of cottonfield and wooded buffer area, with slight topcover.	

Capture Information

Capture Number	Capture Time (00:00)	Identifier	Net ID	Height in Net (m)	Species	Sex	Age	Reproductive Condition	Weight (g)	RFA (mm)	WNS	Recapture Band	Band ID	Band Arm	Band Material	Band Color	Radio Frequency	Photo	Photo ID	Comments
1	20:45	Jay Deatherage	B	2	LABO	F	J	NR	9	39	0	No	[redacted]				N/A	No	[redacted]	
2	21:25	Jay Deatherage	B	1.5	LABO	M	J	NR	8.5	40	0	No	[redacted]				N/A	No	[redacted]	
3	22:00	Jay Deatherage	B	2.5	LABO	F	A	NR	13.75	42	0	No	[redacted]				N/A	No	[redacted]	
4	22:15	Jay Deatherage	B	2	LABO	F	J	NR	8.5	41	0	No	[redacted]				N/A	No	[redacted]	
5	22:30	Jay Deatherage	B	2	LABO	F	J	NR	9	40	0	No	[redacted]				N/A	No	[redacted]	
6	21:15	Jay Deatherage	B	0.5	LABO	F	J	NR	8.5	40	0	No	[redacted]				N/A	No	[redacted]	
7	21:40	Jay Deatherage	B	3	EPFU	F	A	NR	18	45	0	No	[redacted]				N/A	Yes	HS09_EPFU_1	First EPFU caught on project

Weather Information

Date	Time (00:00)	Temperature (°F)	General Weather	Wind Conditions
8/3/2023	19:49	81	Partly Cloudy	Calm
8/3/2023	20:19	80	Partly Cloudy	Calm
8/3/2023	20:49	79	Partly Cloudy	Calm
8/3/2023	21:19	77	Partly Cloudy	Calm
8/3/2023	21:49	76	Partly Cloudy	Calm
8/3/2023	22:19	75	Partly Cloudy	Calm
8/3/2023	22:49	74	Mostly Cloudy	Calm
8/3/2023	23:19	74	Mostly Cloudy	Calm
8/3/2023	23:49	73	Mostly Cloudy	Calm
8/3/2023	0:19	73	Mostly Cloudy	Calm
8/3/2023	0:49	73	Mostly Cloudy	Calm
8/4/2023	19:50	78	Partly Cloudy	Calm
8/4/2023	20:20	76	Partly Cloudy	Calm
8/4/2023	20:50	76	Partly Cloudy	Calm
8/4/2023	21:20	75	Partly Cloudy	Calm
8/4/2023	21:50	74	Partly Cloudy	Calm
8/4/2023	22:20	73	Partly Cloudy	Calm
8/4/2023	22:50	73	Clear	Calm
8/4/2023	23:20	73	Clear	Calm
8/4/2023	23:50	72	Clear	Calm
8/4/2023	0:20	72	Clear	Calm
8/4/2023	0:50	71	Clear	Calm

APPENDIX C
Mist-net Site Photos

A)

B)

Figure 1. Photos of HS-01 mist-net set A which consists of two, nine meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 2. Photos of HS-01 mist-net set B which consists of two, six meters long nets. Photos were taken from each side of the net while facing northeast (A) and southwest (B).

A)

B)

Figure 3. Photos of HS-01 mist-net set C which consists of two, six meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 4. Photos of HS-01 mist-net set D which consists of two, six meters long nets. Photos were taken from each side of the net while facing northeast (A) and southwest (B).

A)

B)

Figure 5. Photos of HS-01 mist-net set E which consists of two, six meters long nets. Photos were taken from each side of the net while facing northwest (A) and southeast (B).

A)

B)

Figure 6. Photos of HS-02 mist-net set A which consists of two, twelve meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 7. Photos of HS-02 mist-net set B which consists of two, nine meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 8. Photos of HS-02 mist-net set C which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 9. Photos of HS-02 mist-net set D which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 10. Photos of HS-02 mist-net set E which consists of two, nine meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 11. Photos of HS-03 mist-net set A which consists of two, nine meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 12. Photos of HS-03 mist-net set B which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 13. Photos of HS-03 mist-net set C which consists of two, nine meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 14. Photos of HS-03 mist-net set D which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 15. Photos of HS-03 mist-net set E which consists of two, twelve meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 16. Photos of HS-04 mist-net set A which consists of two, nine meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 17. Photos of HS-04 mist-net set B which consists of two, four meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 18. Photos of HS-04 mist-net set C which consists of two, six meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 19. Photos of HS-04 mist-net set D which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 20. Photos of HS-04 mist-net set E which consists of two, four meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 21. Photos of HS-05 mist-net set A which consists of two, twelve meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A) 

B) 

Figure 22. Photos of HS-05 mist-net set B which consists of two, nine meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 23. Photos of HS-05 mist-net set C which consists of two, six meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 24. Photos of HS-05 mist-net set D which consists of two, nine meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 25. Photos of HS-05 mist-net set E which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 26. Photos of HS-06 mist-net set A which consists of two, twelve meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 27. Photos of HS-06 mist-net set B which consists of two, twelve meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 28. Photos of HS-06 mist-net set C which consists of two, six meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 29. Photos of HS-06 mist-net set D which consists of two, nine meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 30. Photos of HS-06 mist-net set E which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 31. Photos of HS-07 mist-net set A which consists of two, twelve meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 32. Photos of HS-07 mist-net set B which consists of two, six meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

A)

B)

Figure 33. Photos of HS-07 mist-net set C which consists of two, nine meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 34. Photos of HS-07 mist-net set D which consists of two, six meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 35. Photos of HS-07 mist-net set E which consists of two, nine meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 36. Photos of HS-08 mist-net set A which consists of two, six meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 37. Photos of HS-08 mist-net set B which consists of two, four meters long nets. Photos were taken from each side of the net while facing east (A) and northwest (B).

Figure 38. Photos of HS-08 mist-net set C which consists of two, twelve meters long nets. A photo was only taken facing southwest due to an obstruction on the opposite side of the mist-net.

Figure 39. Photos of HS-08 mist-net set D which consists of two, six meters long nets. A photo was only taken facing southeast due to an obstruction on the opposite side of the mist-net.

Figure 40. Photos of HS-08 mist-net set E which consists of two, six meters long nets. A photo was only taken facing east due to an obstruction on the opposite side of the mist-net.

A)

B)

Figure 41. Photos of HS-09 mist-net set A which consists of two, four meters long nets. Photos were taken from each side of the net while facing east (A) and west (B).

A)

B)

Figure 42. Photos of HS-09 mist-net set B which consists of two, twelve meters long nets. Photos were taken from each side of the net while facing north (A) and south (B).

APPENDIX D
Site Diagrams

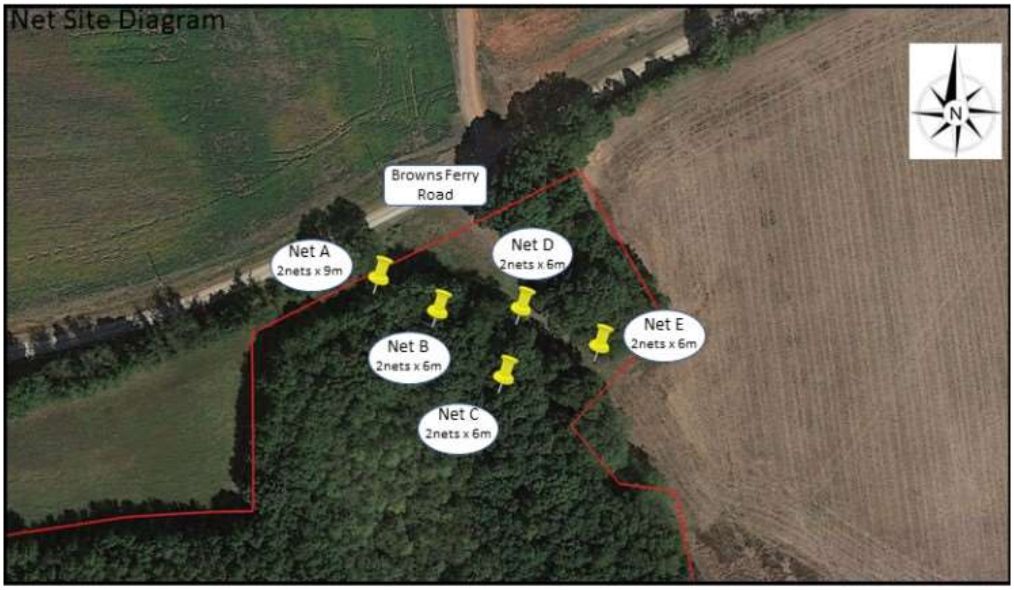

Figure 43. Hillsboro Solar Non-Linear Mist-Net Site HS-01 diagram.

Figure 44. Hillsboro Solar Non-Linear Mist-Net Site HS-02 diagram.

Net Site Diagram

Figure 45. Hillsboro Solar Non-Linear Mist-Net Site HS-03 diagram.

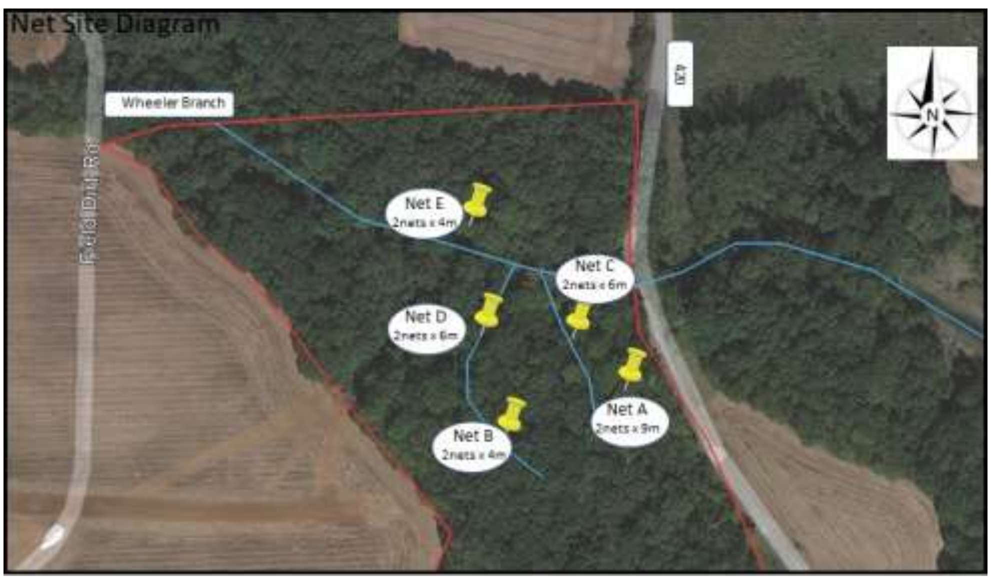

Figure 46. Hillsboro Solar Non-Linear Mist-Net Site HS-04 diagram.

Figure 47. Hillsboro Solar Non-Linear Mist-Net Site HS-05 diagram.

Figure 48. Hillsboro Solar Non-Linear Mist-Net Site HS-06 diagram.

Net Site Diagram

Figure 49. Hillsboro Solar Non-Linear Mist-Net Site HS-07 diagram.

Net Site Diagram

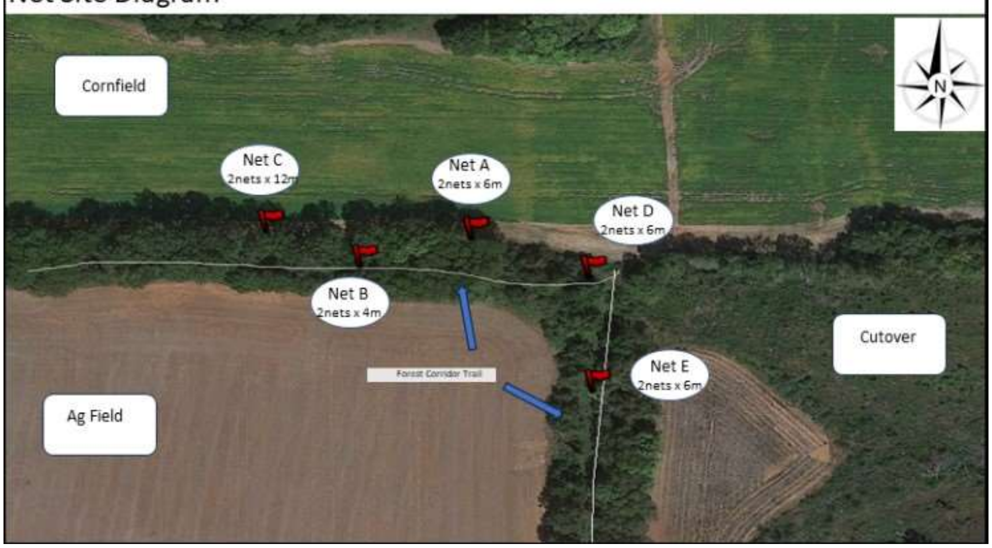

Figure 50. Hillsboro Solar Non-Linear Mist-Net Site HS-08 diagram.

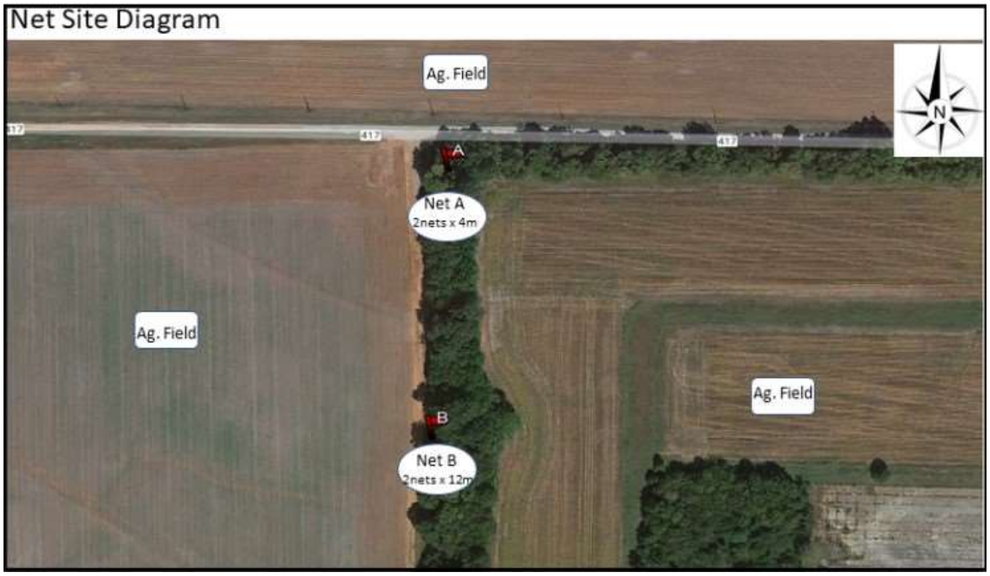

Figure 51. Hillsboro Solar Linear Mist-Net Site HS-09 diagram.

APPENDIX E
Bat Photos

Figure 52. Photo of the first big brown bat (*Eptesicus fuscus*) captured on the Hillsboro Solar Project

Figure 53. Photo of the first eastern red bat (*Lasiurus borealis*) captured on the Hillsboro Solar Project.

Figure 54. Photo of the first evening bat (*Nycticeius humeralis*) captured on the Hillsboro Solar Project.

Figure 55. Photos of the gray bat (*Myotis grisescens*) captured at mist-net site HS-01 on the Hillsboro Solar Project. The large forearm and unicolored hair indicative of this species can be seen in (A) and the distinct attachment of the wing membrane to the ankle, rather than the foot, is shown in (B).

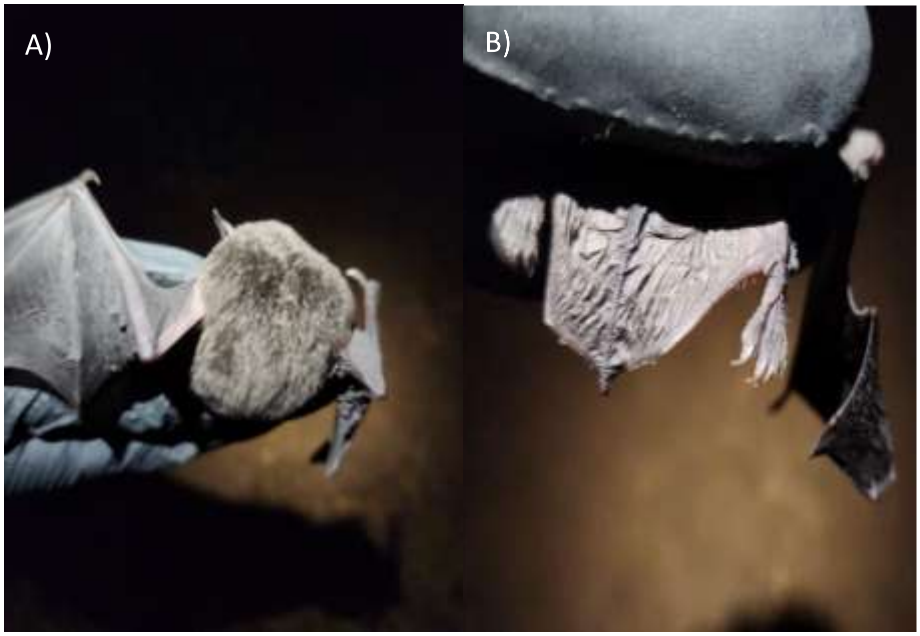

Figure 56. Photos of the gray bat (*Myotis grisescens*) captured at mist-net site HS-05 on the Hillsboro Solar Project. The large forearm and unicolored hair indicative of this species can be seen in (A) and the distinct attachment of the wing membrane to the ankle, rather than the foot, is shown in (B).

Figure 57. Photos of the tricolored bat (*Perimyotis subflavus*) captured at mist-net site HS-03 on the Hillsboro Solar Project. The tricolored fur, pink forearms, and pointed snout indicative of this species can be seen in (A) and the successful application of the radio transmitter is shown in (B).

APPENDIX F

Diurnal Roost Tree Photos

A)

B)

Figure 58. Photos of diurnal roost tree 172577R1. Photos were taken of the bole (A) and canopy (B).

Figure 59. Photos of diurnal roost tree 172577R2. Photos were taken of the bole (A), the leaf cluster where the tricolored bat was observed roosting (B), and the tricolored bat in the roost (C).

A)

B)

Figure 60. Photos of diurnal roost tree 172577R3. Photos were taken of the bole (A) and canopy (B).

APPENDIX G

Diurnal Roost Tree and Emergence Count Data

Table 3. Location and identification information for all diurnal roost trees located during radio telemetry tracking of target bat species captured on the Hillsboro Solar Project.

Date Located	Roost ID	Ownership	State	County	Latitude (DD)	Longitude (DD)	Lead Biologist	Roost Type	% Slope	Slope Aspect (0-360)
8/4/2023	172577R_1	A.F. Rebman	AL	Lawrence	34.65693	-87.22906	Eli Corwin	Tree - live	2	270
8/5/2023	172577R_2	A.F. Rebman	AL	Lawrence	34.65701	-87.22915	Eli Corwin	Tree - live	0	N/A
8/6/2023	172577R_3	A.F. Rebman	AL	Lawrence	34.655204	-87.231397	Eli Corwin	Tree - live	0	N/A

Table 4. Roost tree details for each diurnal roost tree located during radio telemetry tracking of target bat species captured on the Hillsboro Solar Project.

Roost ID	Tree Species	DBH (inches)	Decay State (1-9)	Tree Height (ft)	Live Crown Height (ft)	Roosting Height (ft)	Exfoliating Bark (%)	Canopy Closure	Microhabitat	Microhabitat Sunlight Exposure (hrs.), azimuth
172577R_1	*Liquidambar styraciflua*	17	1	95	55	50	0	90	Canopy/cluster of leaves	5, 90
172577R_2	*Liquidambar styraciflua*	2	1	17	12	8	0	85	Canopy/cluster of leaves	3, 90
172577R_3	*Liquidambar styraciflua*	8	1	55	35	15	0	85	Canopy/cluster of leaves	3, 90

Table 5. Details on the surrounding habitat for each diurnal roost tree located during radio telemetry tracking of target bat species captured on the Hillsboro Solar Project.

Roost ID	Distance to Water (m)	Water Type	Understory Species	Overstory Species	Completed Emergence Surveys	Comments
172577R_1	350	Wetland standing water	Liquidambar styraciflua, Acer rubrum, Cornus florida	Liquidambar styraciflua, Pinus taeda, Quercus falcata	2	
172577R_2	350	Wetland standing water	Liquidambar styraciflua, Acer rubrum, Cornus florida	Liquidambar styraciflua, Pinus taeda, Quercus falcata	0	The roost tree was downed by storm before an emergence count survey could be conducted. Bat was seen in roost during day telemetry, no other bats were observed in this cluster of leaves.
172577R_3	400	Wetland standing water	Liquidambar styraciflua, Acer rubrum, Cornus florida	Liquidambar styraciflua, Pinus taeda, Quercus falcata, Quercus alba	2	

Table 6. Details from emergence count surveys performed on diurnal roost 172522_R1 in Lawrence County, AL. The details of the bats using the tree and emergence patterns (A) as well as the general weather observed at the start, at sunset and at the end of the survey (B) are reported.

A)

Survey Date	Lead Biologist	Bat ID	Tagged bat in tree?	Total Emergence	First Emergence	Last Emergence	Tagged Bat Emergence	Comments
8/4/2023	Lee May	PESU172522	Yes	2	20:01	20:05	20:01	Last azimuth of tagged bat 175. Bats emerged and flew off in the same direction.
8/8/2023	Lee May	PESU172522	No	0	N/A	N/A	N/A	No bat activity observed.

B)

Date	Time	Temperature (°F)	General Weather	Wind Conditions
8/4/2023	19:20	81	Clear	Calm
8/4/2023	19:50	80	Clear	Calm
8/4/2023	20:20	79	Clear	Calm
8/8/2023	19:15	80	Clear	Calm
8/8/2023	19:45	78	Clear	Calm
8/8/2023	20:45	75	Clear	Calm

Table 7. Details from emergence count surveys performed on diurnal roost 172522_R3 in Lawrence County, AL. The details of the bats using the tree and emergence patterns (A) as well as the general weather observed at the start, at sunset and at the end of the survey (B) are reported.

A)

Survey Date	Lead Biologist	Bat ID	Tagged bat in tree?	Total Emergence	First Emergence	Last Emergence	Tagged Bat Emergence	Comments
8/6/2023	Lee May	PESU172522	Yes	1	19:55	19:55	19:55	Last azimuth of tagged bat 25. Bat emerged and flew off almost immediately.
8/7/2023	Lee May	PESU172522	Yes	1	19:58	19:58	19:58	Last azimuth of tagged bat 120. Bat emerged and flew off almost immediately.

B)

Date	Time	Temperature (°F)	General Weather	Wind Conditions
8/6/2023	19:19	82	Clear	Calm
8/6/2023	19:49	80	Clear	Calm
8/6/2023	20:19	78	Clear	Calm
8/7/2023	19:48	80	Partly Cloudy	Calm
8/7/2023	20:18	79	Partly Cloudy	Calm
8/7/2023	20:48	77	Partly Cloudy	Calm

F

Appendix F – Bat Habitat Assessment Data Sheets

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INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 1

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	One large forested wetland occurs as a good water source
Pools/Ponds (# and size)	0	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1: 30 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Willow oak, red maple, sweet gum, shagbark hickory, white oak common hackberry, green ash, post oak			
% Trees w/ Exfoliating Bark	5	20	10	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	60	30	
No. of Suitable Snags	3			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 1 consists of a mixed deciduous forest surrounded by agricultural soy bean fields located along the southern portion of the Project Site. Dominant canopy and understory trees include willow oak, white oak, post oak, shagbark hickory, red maple, green ash, and sweet gum. Trees ranged in size from 3 inches DBH to greater than 40 inches DBH. Three sangs occurred within this stand and several shagbark hickories with peeling bark. Stand 1 was determined to have high quality habitat due to containing greater than 15 trees with peeling bark and three suitable snags. Stand 1 exhibited some diversity in trees and a relatively open understory. This stand lacks a connection to a larger forested stand. The forested wetland provides a water sources for this stand.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

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Project Area

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Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 2

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	One large forested wetland occurs as a good water source
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1: 31 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Willow oak, southern red oak, bur oak, shagbark hickory, green ash, sweet gum, black gum, eastern red cedar			
% Trees w/ Exfoliating Bark	2	6	2	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	60	30	
No. of Suitable Snags	2			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 2 consists of a mixed deciduous forest surrounded by agricultural soy bean fields located centrally within the Project Site. Dominant canopy and understory trees include willow oak, southern red oak, bur oak, shagbark hickory, green ash, sweet gum, black gum, eastern red cedar. Trees ranged in size from 3 inches DBH to greater than 40 inches DBH. Two sangs occured within this stand and several shagbark hickories with peeling bark. Stand 1 was determined to have moderate quality habitat due to containing several trees with peeling bark and two suitable snags. Stand 2 exhibited some diversity in trees and a relatively open understory. This stand lacks a connection to a larger forested stand. The forested wetland provides a water source for this

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 3

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	One large forested wetland occurs as a good water source
Pools/Ponds (# and size)	0	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1: 51 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Water oak, willow oak, shagbark hickory, sweet gum, green ash			
% Trees w/ Exfoliating Bark	0	2	4	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	60	30	
No. of Suitable Snags	8			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 3 consists of a mixed deciduous forest surrounded by roads and agricultural cotton fields located within the southeastern portion of the Project Site. Dominant canopy and understory trees includes water oak, willow oak, shagbark hickory, sweet gum, and green ash. Trees ranged in size from 10 inches DBH to 35 inches DBH. Eight suitable snags occurred within this stand. Stand 3 was determined to have moderate quality bat habitat due to containing several trees with peeling bark and eight suitable snags. Stand 3 exhibited some diversity in trees and relatively open understory. This stand lacks a connection to a larger forested stand. The forested wetland provides a water source for this stand.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to as herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 4

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: The forested wetland occured as a water source within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 1: 37 acres	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Loblolly pine, sweet gum, water tupelo, eastern red cedar			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	30	60	10	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 4 consists of a pine forest stand surrounded by a mixed deciduous stand and a cotton field. Stand 4 is located in the southeastern portion of the Project Site. Dominant canopy and understory trees include loblolly pine, sweet gum, water tupelo, and eastern red cedar. Trees ranged in size from 3 inches DBH to 25 inches DBH. No snags occurred within this stand. Stand 4 was determined to have low quality bat habitat due to containing few trees with exfoliating bark, lack in diversity within the stand, and a thick understory. A forested wetland occurs as a water source within this stand.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to as herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area
Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 5

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	The forested wetland identified as a water source within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1: 69 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Willow oak, water tupelo, sweet gum, post oak, and eastern red cedar			
% Trees w/ Exfoliating Bark	2	4	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	40	50	10	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 5 consists of a mixed bottomland deciduous forest surrounded by cotton fields. Stand 5 is located within the southeastern portion of the Project Stand. Dominant canopy and understory trees include willow oak, water tupelo, sweet gum, post oak, and eastern red cedar. Trees ranged in size from 3 inches DBH to 25 inches DBH. No snags occurred within this stand. Stand 5 was determined to have low habitat quality due to containing few trees with exfoliating bark, some diversity within the stand, and thick understory. A forested wetland occurs as a water source within this stand.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 6

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	Three small wetlands occur as a water source for this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	3: 8 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Loblolly pine, black gum, sweet gum and American Sycamore, willow oak, bur oak			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	60	30	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 6 consists of forested fence line located within the southeastern portion of the Project Site adjacent to a cotton field. Dominant canopy and understory trees include loblolly pine, black gum, sweet gum, American sycamore, willow oak, and bur oak. Trees ranged in size from 10 inches DBH to 40 inches DBH. No snags occurred within this stand and no connection to a larger forested stand exists. The understory of this stand was thick. Stand 6 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar

Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone:

Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	3,924	731		3,193
	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 7

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: No water sources exist within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 0	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	common hackberry, black cherry, sweet gum, black walnut,			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 7 consists of a small wooded area located within the southeastern portion of the Project Site. Stand 7 is surrounded by cotton fields. Dominant canopy and understory trees include common hackberry, black cherry, sweet gum, and black walnut. Trees ranged in size from 10 inches DBH to 25 inches DBH. No snags occurred within this stand, and no connection to a larger forested stand occurs. No water source exists within the stand. Stand 7 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

Stand 6 consists of forested fenceline located within the southeastern portion of the Project Site adjacent to a cotton field. Dominant and understory trees include loblolly pine, black gum, sweet gum, American sycamore, willow oak, and bur oak. Trees ranged in size from 10 inched DBH to 40 inches DBH. No snags occured within this stand and no connection to a larger forested stand occurs. The understory of this stand was thick. Stand 6 was determined to have low habitat quality.

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	3,924	731		3,193
	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 8

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	One small forested wetland exists within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1: 14 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	black gum, black willow, common hackberry, black walnut			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 8 consists of a small wooded area located within the southeastern portion of the Project Site. Stand 8 is surrounded by cotton fields. Dominant canopy and understory trees include common hackberry, black gum, black willow, and black walnut. Trees ranged in size from 10 inches DBH to 20 inches DBH. No snags occurred within this stand, and no connection to a larger forested stand occurs. A forested wetland exists within this stand as a water source. Stand 8 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

Stand 6 consists of forested fenceline located within the southeastern portion of the Project Site adjacent to a cotton field. Dominant and understory trees include loblolly pine, black gum, sweet gum, American sycamore, willow oak, and bur oak. Trees ranged in size from 10 inched DBH to 40 inches DBH. No snags occured within this stand and no connection to a larger forested stand occurs. The understory of this stand was thick. Stand 6 was determined to have low habitat quality.

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	3,924	731		3,193
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 9

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	One small forested wetland exists within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1: 4 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Common hackberry, sweet gum, black walnut			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 9 consists of a small wooded area located within southeastern portion of the Project Site. Stand 9 is surrounded by cotton fields. Dominant canopy and understory trees include common hackberry, sweet gum, and black walnut. Trees ranged in size from 10 inches DBH to 30 inches DBH. No snags occurred within this stand and no connection to a larger forested stand occurs. A small forested wetland occurs within the stand occurs within the stand. Stand 9 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 10

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: Two small wooded wetlands occur as water sources
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 2; 4 acres	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Loblolly pine, suagr maple, water oak, sweet gum, bur oak, turkey oak, southern red oak, post oak, shagbark hickory			
% Trees w/ Exfoliating Bark	0	10	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	8			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:
Stand 10 consists of a moderately sized forested stand within the southeastern portion of the Project Site. Stand 10 is surrounded by cotton fields. Dominant canopy and understory trees include loblolly pine, sugar maple, water oak, sweet gum, bur oak, turkey oak, southern red oak, post oak, and shagbark hickory. Eight snags occur within this stand. No connection to a larger forested stand. Two small forested wetlands occur as a water resource within this stand. Stand 10 was determined to have high habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to as herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 11

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: No water sources exist within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 0	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Basswood, black cherry, post oak, bur oak, privet			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 11 consists of a small wooded area within the southeastern portion of the Project Site. Stand 11 is surrounded by corn fields. Dominant canopy and understory trees include basswood, black cherry, post oak, bur oak, and privet. Trees ranged in size from 3 inches DBH to 40 inches DBH. No snags occurred within the stand. No connection to a larger forested stand. No water sources exist within this stand. Stand 11 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar

Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone:

Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	3,924	731		3,193
	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 12

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: No water sources exist within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 0	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Loblolly pine, post oak, turkey oak, sweet gum, eastern red cedar			
% Trees w/ Exfoliating Bark	0	2	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 12 consists of a small wooded area within the southeastern portion of the Project Site. Stand 10 is surrounded by a corn field. Dominant canopy and understory trees include loblolly pine, southern red oak, post oak turkey oak, and sweet gum. Trees ranged in size from 5 inches DBH to 40 inches DBH. No snags occurred within this stand and this stand lacks a connection to a larger forested stand. No water sources exists within this stand. Stand 12 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

Stand 11 consists of a small wooded area within the southeastern portion of the Project Site. Stand 11 is surrounded by corn fields. Dominant and understory trees include basswood, black cherry, post oak, bur oak, and privet. Trees ranged in size from 3 inches DBH to 40 inches DBH. No snags occured within the stand. No connection to a larger forested stand. No water sources exist within this stand. Stand 11 was determiend to have low habitat quality.

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to as herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 13

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	
Pools/Ponds (# and size)	0	Open and accessible to bats?		Two small wooded wetlands occur as a water source
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	2: 4 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Bur oak, turkey oak, black gum, eastern red cedar			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	1			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 13 consists of a small wooded fence line within the southeastern portion of the Project Site. Stand 13 is surrounded by corn fields. Dominant canopy and understory trees include bur oak, turkey oak, black gum and eastern red cedar. Trees ranged in size from 10 inches DBH to 40 inched DBH. One suitable snag occurs witł this stand. No connection to a larger forested stand occurs. Two small wooded wetlands occur within this stan Stand 13 was determined to have low habitat quality

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar   Date: 8/14/2023

Township/Range/Section: ____________________

Lat Long/UTM/ Zone: ____________________   Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	**Post-Project**
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 14

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0	0	One small forested wetland occurs within the stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	1:11 acres	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	sweet gum, black gum, sugar hackberry, willow oak, water oak			
% Trees w/ Exfoliating Bark	0	2	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 14 consists of a small wooded area within the southwestern portion of the Project Site. Stand 14 is surrounded by cotton fields. Dominant canopy and understory trees include sweet gum, black gum, sugar hackberry, willow oak, and water oak. Trees ranged in size from 10 inches DBH to 30 inches DBH. No suitable snags occur within this stand. No connection to a larger forested stand occurs. One forested wetland occurs within this stand. Stand 14 was determined to have low habitat quality

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 15

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 1: 4,000 ft	Describe existing condition of water sources: Two forested wetlands and one perennial stream exists as a water source within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 2: 45acres	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Shagbark hickory, water oak, post oak, red maple, eastern red cedar, white oak, and sweet gum			
% Trees w/ Exfoliating Bark	5	10	10	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	6			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 15 consists of a moderately sized forested stand that exists within the northeastern portion of the Project Site. Stand 15 is surrounded by roads and agricultural fields. Dominant canopy and understory trees include shagbark hickory, water oak, post oak, red maple, eastern red cedar, white oak, and sweet gum. Trees ranged in size from 10 inches DBH to 40 inches DBH. Six suitable snags occur within this stand. No connection to a larger forested stand exists. A large perennial stream and wetland system occur within this stand. Stand 15 was determined to have high quality habitat.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 16

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: One wooded wetland occur as a water source within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 1:25 acres	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Common hackberry, American Beech, turkey oak, and shagbark hickory			
% Trees w/ Exfoliating Bark	0	2	2	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	4			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 16 consists of a small deciduous forest surrounded by agricultural fields, located within the northern portion of the Project Site. Dominant canopy and understory trees include willow oak, sweetgum, winged sumac, black oak, post oak, and black gum; however, this stand had an open understory. Trees ranged in size from 3 to 35 inches DBH. Four suitable snags and few trees with exfoliating bark were identified within this stand. Stand 16 lacks a connection to a larger forested stand within the Project Site and overall tree species diversity within the stand was characterized as moderate. One forested wetland totaling approximately 25 acres was identified within the stand as providing a suitable water source. Stand 16 was categorized as having moderate quality bat roosting and foraging habitat.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres		Open Acres
Project	3,924	731		3,193
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	Plans not developed	Plans not developed	Plans not developed	

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 17

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: Two wooded wetlands occur as a water source within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats? Yes		
Wetlands (approx. ac.)	Permanent: 2:8 acres	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Common hackberry, American Beech, turkey oak, and shagbark hickory			
% Trees w/ Exfoliating Bark	0	2	2	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	3			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 17 consists of a wooded area located in the northern portion of the Project Site. Stand 17 is surrounded by agricultural fields. Dominant canopy and understory trees include common hackberry, American beech, turkey oak, and shagbark hickory. Trees ranged in size from 5 inches DBH to 30 inches DBH. Three suitable snags occur within this stand. A connection to a larger forested stand exists. Two forested wetlands occur within the stand. Stand 17 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 18

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: No water source exists within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent: 0	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Willow oak, post oak, sweet gum, eastern red cedar			
% Trees w/ Exfoliating Bark	0	0	2	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 18 consists of a wooded area located in the northwestern portion of the Project Site. Stand 18 is surrounded by cotton fields. Dominant canopy and understory trees include willow oak, post oak, sweet gum, and eastern red cedar. Trees ranged in size from 3 inches DBH to 30 inches DBH. No suitable snags occur within the stand. Stand 18 lacks a connection to a larger forested stand. No water sources exists within this stand. Stand 18 was determined to have low habitat quality.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	**Post-Project**
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 19

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial: 0	Describe existing condition of water sources: No water source exists within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent: 0	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Loblolly pine, southern red oak, eastern red cedar, and post oak			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 19 consists of wooded area located centrally within the Project Site. Stand 19 is surrounded by corn fields. Dominant canopy and understory trees include loblolly pine, southern red oak, eastern red cedar, and post oak. Trees ranged in size from 10 inches DBH to 45 inches DBH. No suitable snags occur within the stand. Stand 19 lacks a connection to a larger forested stand. No water source exists within this stand.
Stand 19 was determined to have low quality habitat.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description

Sample Site No.(s): 20

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial:	Describe existing condition of water sources: A Small forested wetland acts as a water source for this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent: 1: 06 acres	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	loblolly pine, southern red oak, eastern red cedar, sweet gum, sugar berry, mockernut hickory, and post oak			
% Trees w/ Exfoliating Bark	5	10	5	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	3			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 20 consists of mixed forest surrounded by soybean field, located in the northeast corner of the Project Site. Dominant canopy and understory trees include loblolly pine, southern red oak, eastern red cedar, sweet gum, sugar berry, mockernut hickory, and post oak. Trees ranged in size from 5 to 45 inches DBH. Three suitable snags and several trees with exfoliating bark were identified within this stand. Stand 20 has connection to a larger forested stand outside of the Project Site and overall tree species diversity within the stand was characterized as moderate. One forested wetland occurs as a water source for this stand. Based on these characteristics, Stand 20 was categorized as having moderate quality bat roosting and foraging habitat. Representative photographs of Stand 20 are included in Appendix B, Photo 49.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar

Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone:

Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 21

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	0	0		No water source exits within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent	Seasonal		
	0	0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Loblolly pine, chinese privet,			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 21 consists of a loblolly pine stand surrounded by soybean field, located in the northeastern corner of the Project Site. Dominant canopy and understory trees include loblolly pine, eastern red cedar, and Chinese privet. Trees ranged in size from 10 to 25 inches DBH. No suitable snags and few trees with exfoliating bark were identified within this stand. Stand 21 lacks connection to any larger forested stands within the Project Site and overall tree species diversity within the stand was characterized as low. No water sources were identified within this stand. Based on these characteristics, Stand 21 was categorized as having low quality bat roosting and foraging habitat. Representative photographs of Stand 21 are included in Appendix B, Photo 50.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Hillsboro Solar Date: 8/14/2023

Township/Range/Section:

Lat Long/UTM/ Zone: Surveyor: Lyranda Thiem

Brief Project Description

proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	3,924	731	3,193

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	Plans not developed	Plans not developed	Plans not developed

Vegetation Cover Types

Pre-Project	Post-Project
cropland, dry and wet deciduous forests, Scrub/Shrub Clear Cut maintained lawn dry herbeceous pine pasture	Plans are not set yet

Landscape within 5 mile radius

Flight corridors to other forested areas?

Yes

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

Cropfields/ residential areas

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project site is approximately 21 miles southeast of Wheeler National Wildlife Refuge

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area

A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 22

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: 0	Intermittent: 0	Perennial:	Describe existing condition of water sources: No water source exits within this stand
Pools/Ponds (# and size)	0	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent: 0	Seasonal: 0		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	4	3	1	
Dominant Species of Mature Trees	Loblolly pine, chinese privet,			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10	40	50	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Yes and NLEB

Additional Comments:

Stand 22 consists of a loblolly pine stand surrounded by soybean field, located in the northeastern corner of the Project Site. Dominant canopy and understory trees include loblolly pine, eastern red cedar, and Chinese privet. Trees ranged in size from 10 to 25 inches DBH. No suitable snags and few trees with exfoliating bark were identified within this stand. Stand 22 lacks connection to any larger forested stands within the Project Site and overall tree species diversity within the stand was characterized as low. No water sources were identified within this stand. Based on these characteristics, Stand 22 was categorized as having low quality bat roosting and foraging habitat. Representative photographs of Stand 22 are included in Appendix B, Photo 50.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

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Appendix G – Vegetation Assessment Report by Alfred Schotz

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Vegetation Assessment of the Proposed
Urban Grid – Hillsboro Solar Site, Lawrence County, Alabama

Prepared for:

HDR
440 South Church Street, Suite 1200
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Prepared by:

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April 15, 2024

DRAFT

INTRODUCTION

Alfred Schotz was contracted by HDR Engineering, Inc. to conduct a vegetation assessment of the proposed Urban Grid – Hillsboro Solar site, a parcel comprised of a main parcel consisting of approximately 3,761 acres and an adjoining transmission line of roughly 10.2 miles, in Lawrence County, Alabama (Figures 1 and 2). The primary objective of the contract was to delineate vegetation types within the parcel and determine their suitability of containing federally listed plant species and taxa monitored by the Alabama Natural Heritage Program (ALNHP) as conservation concern in the state. The tract falls within the Highland Rim physiographic section, an area characterized by relatively flat and well-drained terrain interspersed with low undulating hills. The region is underlain by chert-bearing limestones primarily associated with the Bangor and Tuscumbia formations. The vegetation of the Highland Rim is distinctive in Alabama because it contains many species associated with the Midwest and because of its location at a crossroads of the Valley and Ridge and Coastal Plain physiographic sections. Here, forest communities typical of the mid-western states converge with those from further east to produce an unusual suite of plant life not found elsewhere in the state. Vegetation patterns are distinctive, where amidst myriad pastures and croplands are two primary forest communities. One is comprised of sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), blue ash (*Fraxinus quadrangulata*), chinquapin oak (*Quercus muehlenbergii*), Shumard oak (*Quercus shumardii*), southern shagbark hickory (*Carya carolinae-septentrionalis*), redbud (*Cercis canadensis*), sugarberry (*Celtis laevigata*), and eastern red cedar (*Juniperus virginiana*); the other, dictated by areas of greater soil acidity, is characterized by an assemblage of black, white, and post oaks (*Quercus velutina*, *Q. alba*, and *Q. stellata*, respectively), mockernut and pignut hickories (*Carya tomentosa* and *C. glabra*), tuliptree (*Liriodendron tulipifera*), flowering dogwood (*Cornus florida*), and loblolly pine (*Pinus taeda*).

Wetlands are numerous and contain flora displaying many relationships to the plant life of the Coastal Plain. Bottomlands are forested with bald cypress (*Taxodium distichum*), water tupelo (*Nyssa aquatica*), and river birch (*Betula nigra*) in the wettest areas, whereas a slight increase of elevation along stream terraces permits cherrybark oak (*Quercus pagoda*), swamp chestnut oak (*Quercus michauxii*), willow oak (*Quercus phellos*), green ash (*Fraxinus pennsylvanica*), sweet gum (*Liquidambar styraciflua*), silver maple (*Acer saccharinum*), and sycamore (*Platanus occidentalis*) to become more conspicuous. Other wetlands abound, isolated from rivers and streams that support a different suite of flora, most notably a mixture of red maple (*Acer rubrum*), green ash, swamp black gum (*Nyssa biflora*), swamp dogwood (*Cornus stricta*), and occasionally swamp white oak (*Quercus bicolor*), a species typical of the Northeast and Midwest not known elsewhere in Alabama.

The region enjoys a moderate climate, characterized by cool winters and quite warm summers. Summer temperatures are generally in the low 90s, with most afternoon temperatures being modified by thunderstorms. Winter temperatures commonly fall below the freezing point, but rarely go below zero. Precipitation is well distributed throughout the year with the greater

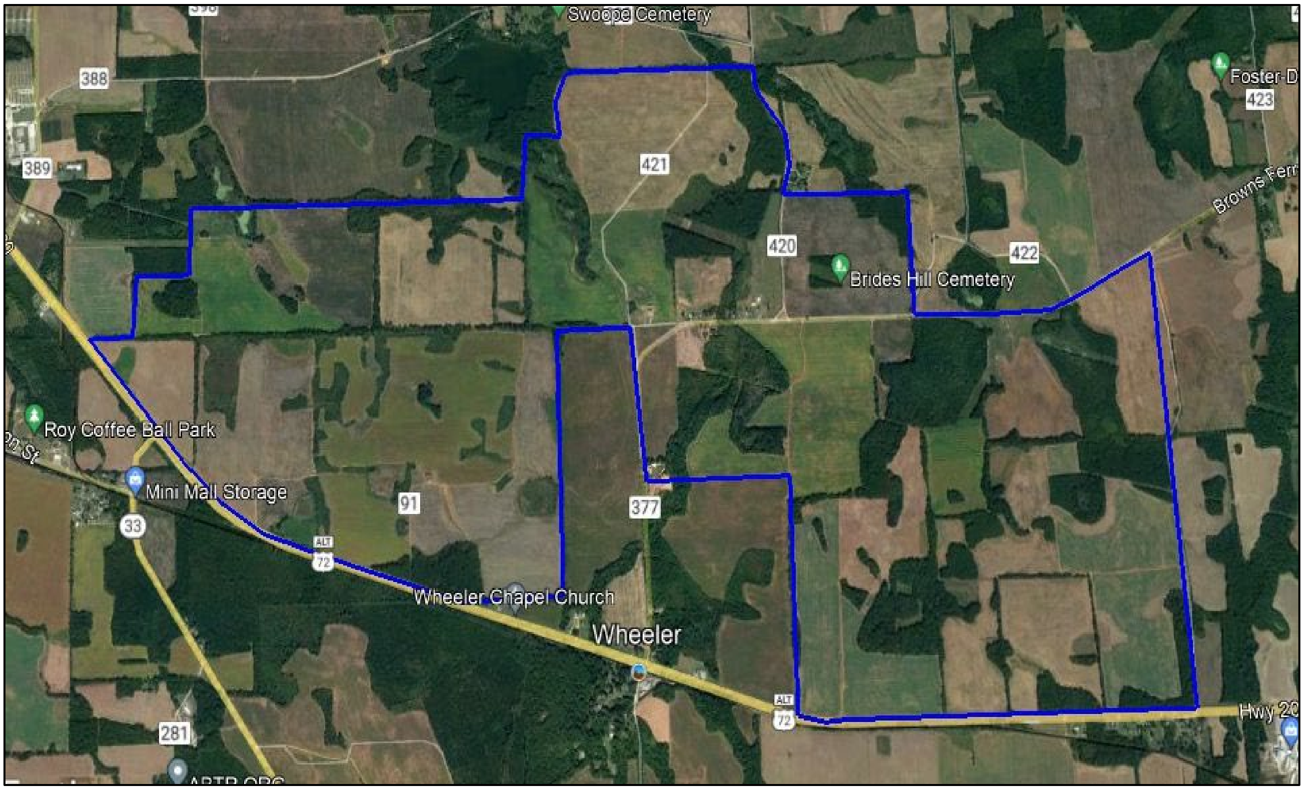

Figure 1. Approximate boundary of the main parcel for the proposed Urban Grid – Hillsboro Solar Site in Lawrence County, Alabama.

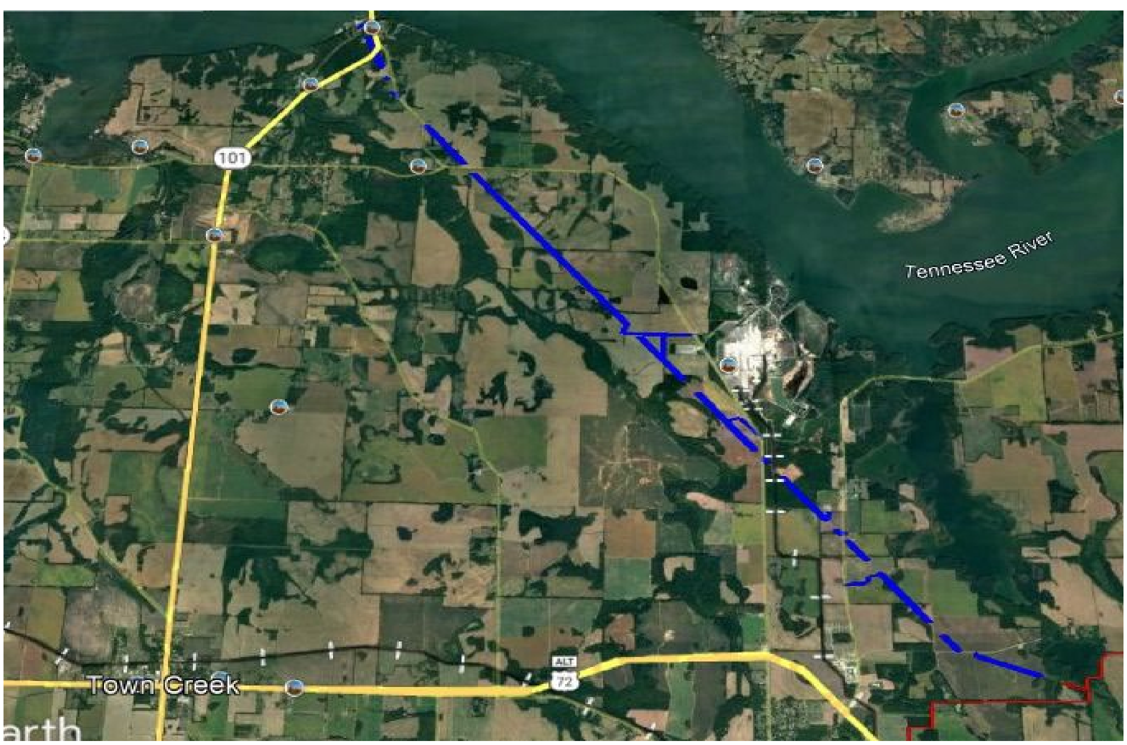

Figure 2. Transmission line for the proposed Urban Grid – Hillsboro Solar Site in Lawrence County, Alabama.

amounts in wintertime when cyclonic storms from the Gulf of Mexico reach the area with greater intensity and frequency. A second peak rainfall period generally occurs in July, principally from thunderstorms that move into the area from the south and southwest. The growing season averages roughly 230 days, with the average occurrence of the last freezing temperature in spring is early April and the average first freezing temperature in the fall is early November.

The parcel is largely dedicated to active agriculture, most notably row crops such as corn, cotton, and soybeans (Figure 3). Although primarily devoted intensive agriculture, the tract contains areas of natural and semi-natural (e.g., logged areas and pine plantations) vegetation that are distributed throughout. This report is structured to identify and describe areas of natural vegetation that are contained within the main parcel and transmission line, following the naming convention of the National Vegetation Classification (NVC) in detailing the types of plant associations including characteristic species, any ecological significance, and apparent suitability for rare and endangered flora as identified by the U.S. Fish and Wildlife Service (USFWS) and the Alabama Natural Heritage Program (ALNHP).

METHODOLOGY

Figure 3. Typical agricultural field at the Hillsboro Solar site. Photo shows field of harvested corn.

The fundamental objective of this assessment was to assist HDR Engineering in evaluating the proposed Urban Grid – Hillsboro Solar site to determine its suitability for containing rare and endangered plant life as recognized by the USFWS and the ALNHP. An emphasis was placed on conducting field inspections in areas having the greatest probability of supporting rare and endangered flora. To ensure the most comprehensive assessment possible, a controlled intuitive or meander approach was implemented for field surveys. Prior to field surveys, topographical maps, soil surveys, and aerial photos were examined to identify vegetation signatures that may suggest significant habitats and natural areas warranting detailed inventory efforts. The degree of inventory detail applied to specific areas was based on the overall suitability of the habitat to contain special plant species or identified as possessing ecological significance. Areas exhibiting intensive agricultural use (e.g., corn and soybean fields, clearcuts) or other cases where natural processes appear to have been severely interrupted received no or minimal attention. The naming convention of natural community types in the forthcoming section follows the National Vegetation Classification (NVC), a dynamic online resource available through NatureServe Explorer (https://explorer.natureserve.org/). In preparation of this report, field notes were taken, and GPS points acquired to denote areas of interest and highlight principal vegetation features.

RESULTS

Field inspections conducted from March 22-25, 2024, identified seven principal ecological associations as defined by the NVC (Table 1) within the tract that exhibit sufficient suitability to support rare and endangered flora. Each area will be described independently in the forthcoming narrative, summarizing ecological associations, representative plant life, and rare species for which onsite conditions appear suitable. Where applicable, the naming convention employed by the NVC (NatureServe 2024) is placed above each vegetation account. Numbers on the forthcoming aerial (Figure 4) correspond to the individual accounts below. The ecological associations presented in Table 1 are representative of the Interior Low Plateau and are common across the region. An undetermined species of lily (*Lilium* sp.), proposed as either *L. canadense* or *L. michiganense* based on vegetative features was observed; both taxa are currently monitored by ALNHP as rare species. No federally listed taxa were observed.

Table 1. Natural and semi-natural ecological associations having the potential to contain rare and endangered plant species at the Project Site.

Scientific Name	Colloquial Name	Locations
Quercus falcata – Quercus alba – Carya tomentosa / Oxydendrum arboreum Interior Low Plateau Woodland	Interior Low Plateau Southern Red Oak – White Oak Woodland	Section 1/Parcels A & B, Section 5/Parcels C
Quercus alba – Carya ovata – Liriodendron tulipifera – (*Quercus phellos*) / *Cornus florida* Forest	Highland Rim White Oak – Tuliptree Mesic Lower Slope Forest	Section 2/Parcel A
Quercus nigra – Quercus (alba, phellos) Floodplain Forest	Eastern Highland Rim Water Oak Floodplain Forest	Section 3/Parcel A, Section 4/Parcel A, Section 5/Parcels A
Quercus lyrata – Carya aquatica Floodplain Forest	Overcup Oak – Water Hickory Floodplain Forest	Section 5/Parcels C
Celtis (laevigata, occidentalis) – Ulmus ssp. – *(Aesculus glabra)* Ruderal Forest	Interior Low Plateau Ruderal Sugarberry – Hackberry Forest	Section 1/Parcel C
Fraxinus pennsylvanica – Ulmus americana – Celtis laevigata / Ilex decidua Floodplain Forest	Southern Green Ash – Elm – Sugarberry Floodplain Forest	Section 1/Parcels D & E
Pinus taeda Forest Plantation	Loblolly Pine Plantation	Section 4/Parcel B, Section 5/Parcels D

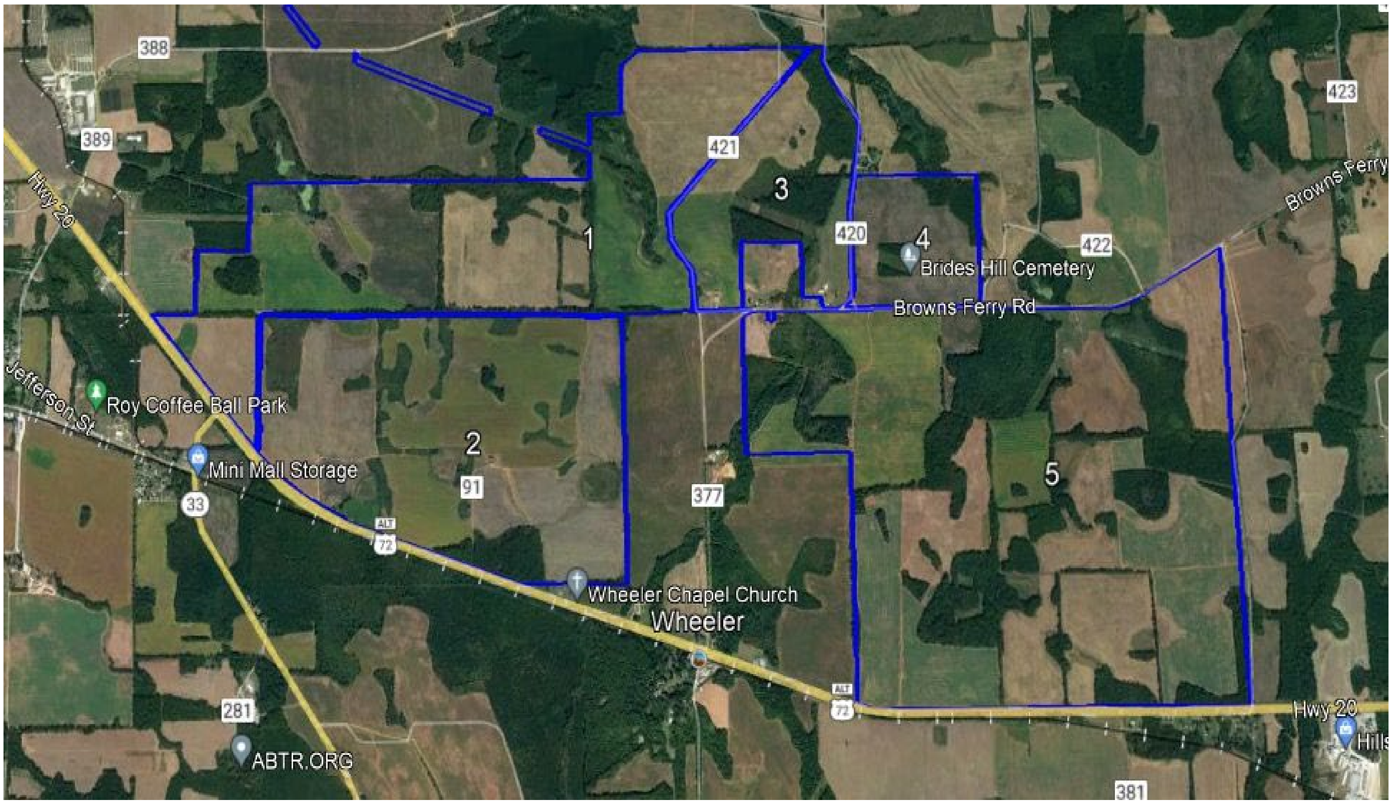

Figure 4. Aerial showing numbered sections within the proposed Urban Grid – Hillsboro Solar site, which correspond to vegetation descriptions under RESULTS of this report.

<u>Vegetation Descriptions of Sections</u>

Section 1

Section 1 is defined by a mix of agriculture fields, forested and non-forested wetlands, and mature pine-hardwood forests of various ages. The following ecological associations, adhering to NVC nomenclature, are discussed below

NVC Name:

Scientific Name: *Quercus falcata – Quercus alba – Carya tomentosa / Oxydendrum arboreum* Interior Low Plateau Woodland

Colloquial Name: Interior Low Plateau Southern Red Oak – White Oak Woodland

This natural community type is represented by two occurrences in Section 1. The vegetation of the first location (Figure 6, Parcel A) is characterized by a mature, closed-canopied (~85% coverage) upland hardwood forest containing inclusions of shortleaf, Virginia, and loblolly pines (*Pinus echinata, virginiana* and *P. taeda*, respectively). The hardwood component is primarily represented by oaks, with southern red oak (*Quercus falcata*), post oak (*Q. stellata*), and willow oak (*Q. phellos*) appearing most numerous. Occurring as secondary importance are additional species, scattered among the abovementioned oaks, including water oak (*Quercus nigra*), mockernut hickory (*Carya tomentosa*), sweetgum (*Liquidambar styraciflua*), persimmon

(*Diospyros virginiana*), and black cherry (*Prunus serotina*). The average dbh for canopy species is 14". The shrub layer is relatively dense (~65% coverage) and uniformly distributed, attaining its greatest development in canopy gaps and along forest margins. Principal taxa include Chinese privet (*Ligustrum sinense*), coralberry (*Symphoricarpos orbiculatus*), and greenbriers (*Smilax glauca* and *S. rotundifolia*), as well as saplings of the foregoing canopy species (Figure 5). The ground layer was poorly represented and of low diversity, with Japanese honeysuckle (*Lonicera japonica*) having become well established throughout. Additional species, while of much less significance, include longleaf spikegrass (*Chasmanthium sessiliflorum*), Christmas fern (*Polystichum acrostichoides*), ebony spleenwort (*Asplenium platyneuron*), cranefly orchid (*Tipularia discolor*), smallflower baby blue eyes (*Nemaphila aphylla*), wild comfrey (*Andersonglossum virginianum*), and woolly elephant's-foot (*Elephantopus tomentosus*).

Figure 5. Representative vegetation structure at Parcel A, Figure 6.

Non-native invasive species are common, most notably Chinese privet, Japanese honeysuckle, paper mulberry (*Broussonetia papyrifera*), and periwinkle (*Vinca minor*), often of which form dense, nearly impenetrable thickets.

Notwithstanding the relatively high incidence of exotic flora, the site has low to moderate suitability for containing a small suite of rare and endangered plant life. Species having the greatest potential are presented in Table 2.

The second location (Figure 6, Parcel B) is comparable in composition, structure, and age, represented by a mature canopy (~80% coverage) characterized by southern red oak, post oak, white oak, water oak, mockernut hickory, sweetgum, persimmon, and black cherry. The average dbh for canopy species is 14". The shrub component is relatively open (~45% coverage), largely consisting of saplings of the foregoing canopy species. The groundcover is very sparse, with the exception of occasional patches of Japanese honeysuckle scattered throughout. Herbs include ebony spleenwort, smallflower baby blue eyes, cranefly orchid, southern twayblade (*Neottia bifolia*), and wild comfrey. The overall integrity of the parcel is good with a minimal incursion of non-native invasive species. Owing to the good quality of the parcel, the presence of rare and endangered flora is conceivable, with taxa having the greatest promise appearing in Table 2.

Table 2. Rare and endangered taxa having low to good potential of occurring in the *Quercus falcata – Quercus alba – Carya tomentosa / Oxydendrum arboreum* Interior Low Plateau Woodland in Parcels A and B, Figure 6 based on habitat suitability.

Species Name	Common Name
Aplectrum hyemale	Puttyroot
Astragalus canadensis	Canadian Milkvetch
Corallorhiza wisteriana	Spring Coralroot
Celastrus scandens	Climbing Bittersweet
Isotria verticillata	Large Whorled Pogonia
Liparis liliifolia	Lily-leaved Twayblade
Nestronia umbellula	Nestronia
Orobanche uniflora	Cancer Root
Silene ovata	Ovate Catchfly
Trillium pusillum var. *ozarkanum*	Ozark Least Trillium
Trillium recurvatum	Prairie Trillium

NVC Name:

Scientific Name: *Celtis (laevigata, occidentalis) – Ulmus* ssp. *– (Aesculus glabra)* Ruderal Forest

Colloquial Name: Interior Low Plateau Ruderal Sugarberry – Hackberry Forest

This occurrence (Figure 6, Parcel C) contains a mix of young mature hardwoods (~80% canopy coverage, ~14” dbh) primarily consisting of sugarberry (*Celtis laevigata*), accented with a scattering of large cherrybark oak (*Quercus pagoda*), some of which attain dimensions of roughly 3.5 feet dbh. The shrub stratum is dense throughout most of the parcel, primarily dominated by Chinese privet with a lesser incidence of Japanese honeysuckle and greenbriers. Due to the dense shrub layer the herbaceous component is very sparse, represented by an occasional butterweed (*Packera glabella*) and Cherokee sedge (*Carex cherokeensis*). Situated in the northernmost portion of the parcel are two small wetland depressions characterized by an open canopy (~20% coverage) and bounded by a dense patchwork of trumpet creeper (*Campsis radicans*) and greenbriers along the periphery. Because of the high incidence of exotic species and past anthropogenic disturbances, the parcel has very low suitability for federally and state listed flora.

NVC Name:

Scientific Name: *Fraxinus pennsylvanica – Ulmus americana – Celtis laevigata* / *Ilex decidua* Floodplain Forest

Colloquial Name: Southern Green Ash – Elm – Sugarberry Floodplain Forest

This association is represented by two parcels (Figure 6, Parcels D and E), straddling the north boundary of Section 1. Each parcel is defined by a mature canopy (~80% coverage) of hardwoods, most notably water oak (*Quercus nigra*), green ash (*Fraxinus pennsylvanica*), and sugarberry, with a slightly lesser prevalence of American elm (*Ulmus americana*), sycamore (*Platanus occidentalis*), cherrybark oak, and black cherry (*Prunus serotina*). The approximate average dbh of the canopy species is 13.5”. The majority of both parcels contain a dense shrub layer (~80% coverage), primarily characterized by nearly impenetrable thickets of Chinese privet. While of much less prominence, other taxa represented in the shrub stratum include elderberry (*Sambucus canadensis*), deciduous holly (*Ilex decidua*), spicebush (*Lindera benzoin*), as well as saplings of the foregoing canopy species. The groundcover is dominated by Japanese honeysuckle, nearly to the exclusion of other vegetation. Cherokee sedge, greater bladder sedge (*Carex intumescens*), sensitive fern (*Onoclea sensibilis*), smallflower baby blue eyes, and blue violet (*Viola sororia*) are sparse and widely scattered, occurring in openings with a minimal incursion of privet and honeysuckle. Because of the high incidence of noxious flora, the parcels have very low suitability for federally and state listed flora.

NVC Name: No corresponding representation is apparent in the National Vegetation Classification

A small, open wetland straddles the northern boundary of Section 1 (Figure 6, Parcel F). Characterized by a low incidence (~15% coverage) of black willow (*Salix nigra*) and water oak, the wetland appears to be intermittently inundated, having been replenished by the recent occurrence of heavy precipitation. Patches of low shrubs and vines are apparent throughout, assuming their greatest prominence in deeper portions of the depression, just beyond the project area. Principal species consist of buttonbush (*Cephalanthus occidentalis*), trumpet creeper, and various greenbriers (*Smilax* spp.). Cocklebur (*Xanthium strumarium*) and duckweed (*Lemna* sp.) were the most conspicuous herbs. Because of severe, long-term disturbance, the parcel has a very low probability to support rare and endangered plant species, but is noted for the presence of waterfowl observed during March 2024.

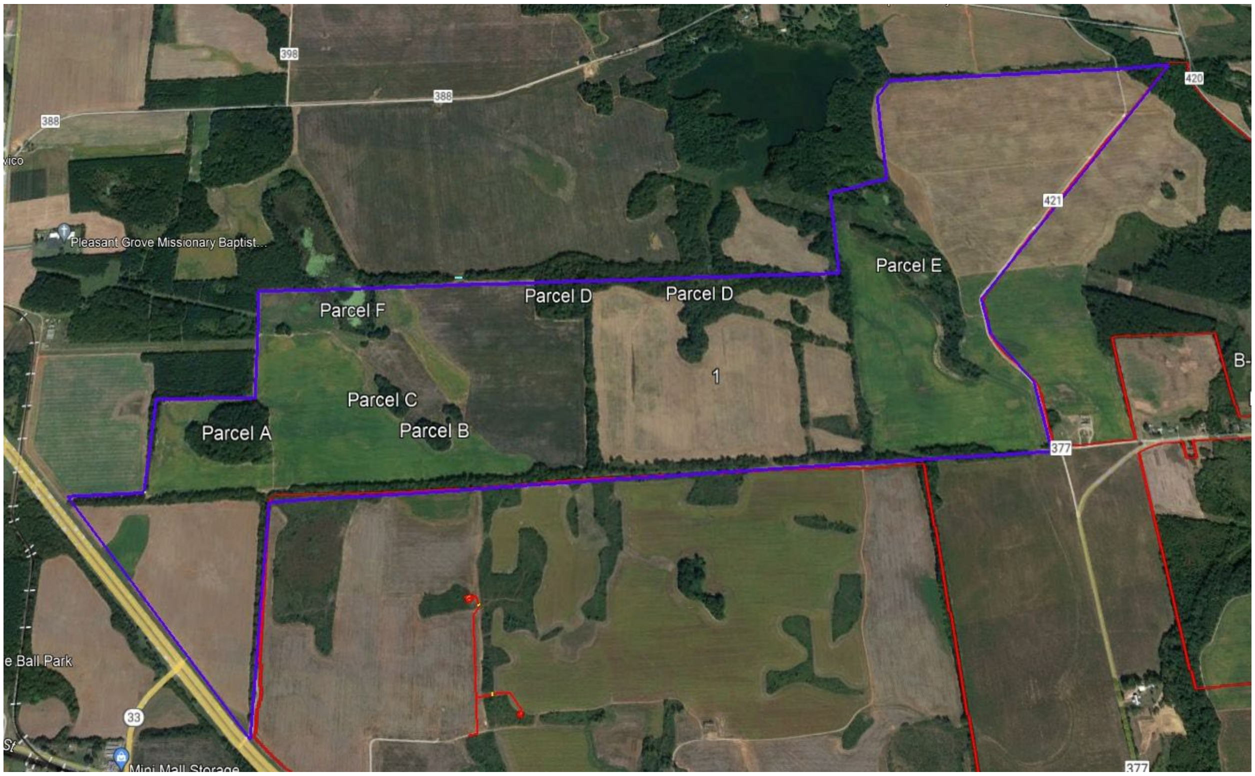

Figure 6. Section 1 with corresponding parcels of natural and semi-natural vegetation.

Section 2

Nearly all non-agricultural, natural vegetated parcels in Section 2 have been recently clearcut, precluding a discernible vegetation type. The vegetation is characterized by a scattering of tree stumps and trunks largely covered in dense tangles of vines and shrubs (Figures 7 & 8). Occasional small (~7” dbh), non-merchantable trees remain upright and primarily include willow oak (*Quercus phellos*), cherrybark oak, sweetgum (*Liquidambar styraciflua*), sugarberry, black cherry, Osage orange (*Maclura pomifera*), and chinaberry (*Melia azedarach*). Principal shrubs and vines are Chinese privet, Japanese honeysuckle, smooth sumac (*Rhus glabra*), round-leaf brier (*Smilax rotundifolia*), coralbead (*Nephroia carolina*), as well as saplings of the above-mentioned tree species. Weedy, heliophytic herbaceous taxa are common throughout all parcels with those appearing most representative include pokeweed (*Phytolacca americana*), southern blackberry (*Rubus pensilvanicus*), tall goldenrod (*Solidago altissima)*, horseweed (*Conyza canadensis*), and tall fescue (*Lolium arundinaceum*), among others. Because of high levels of disturbance, these parcels have no suitability for rare and endangered plant species.

Figure 7. Representative vegetation of recently logged parcels in Section 2.

Figure 8. Representative vegetation structure of recently logged parcels in Section 2.

One parcel in the section is represented by mature hardwoods and conforms to the following NVC designation.

NVC Name:

Scientific Name: *Quercus alba – Carya ovata – Liriodendron tulipifera* – (*Quercus phellos*) / *Cornus florida* Forest

Colloquial Name: Highland Rim White Oak – Tuliptree Mesic Lower Slope Forest

This parcel (Figure 9, Parcel A) is characterized by a mature canopy (~85% coverage) of hardwoods, most notably shagbark hickory (*Carya ovata*), cherrybark oak, willow oak, sweetgum, and to a lesser extent, water oak, white oak (*Quercus alba*), American elm, and red maple. The approximate average dbh of canopy species is 15”. The shrub layer is relatively open (~40% coverage) and is primarily comprised of winged elm (*Ulmus alata*), sugarberry, deciduous holly (*Ilex decidua*), a sparse scattering of Chinese privet, flowering dogwood (*Cornus florida*), and blackgum (*Nyssa sylvatica*) in addition to saplings of the foregoing canopy species. The herbaceous component is relatively diverse, comparable to similar conditions elsewhere in the region, with the following species appearing most conspicuous: slender spikegrass (*Chasmanthium laxum*), Cherokee sedge (*Carex cherokeensis*), greater bladder sedge (*Carex intumescens*), spring beauty (*Claytonia virginica*), mayapple (*Podophyllum peltatum*), spring cress (*Cardamine bulbosa*), wild garlic (*Allium canadense*), and false nettle (*Boehmeria cylindrica*).

Figure 9. Section 2 showing parcels of semi-natural and natural vegetation. Parcel A is considered as natural vegetation.

Given a minimal incursion of exotic plant species and human-derived disturbances, the parcel is in relatively good condition. An immature species of lily (*Lilium* sp.), determined as either *L. canadense* or *L. michiganense* based on vegetative features was observed (Figure 10), both of which are currently tracked by ALNHP as rare taxa. Because of forest maturity and the absence of severe disturbance, the parcel has a moderate to high level of suitability to contain other state and federally listed taxa presented in Table 3.

Figure 10. Undetermined species lily (*Lilium* sp.) in Section 2, Parcel A.

Table 3. Rare and endangered taxa having low to good potential of occurring in the *Quercus alba – Carya ovata – Liriodendron tulipifera –* (*Quercus phellos*) */ Cornus florida* Forest in Parcel A, Figure 9 based on habitat suitability.

Species Name	Common Name
Aplectrum hyemale	Puttyroot
Corallorhiza wisteriana	Spring Coralroot
Celastrus scandens	Climbing Bittersweet
Geum vernum	Springs Avens
Isotria verticillata	Large Whorled Pogonia
Iris prismatica	Slender Blue Iris
Lilium michiganense	Michigan Lily
Lilium superbum	Turk's-cap Lily
Liparis liliifolia	Lily-leaved Twayblade
Pachysandra procumbens	Allegheny Spurge
Trillium pusillum var. *ozarkanum*	Ozark Least Trillium
Trillium recurvatum	Prairie Trillium

Section 3

Section 3 is defined as a combination of active agricultural lands and forested areas represented by two naturally occurring vegetation types. Each type is described in further detail below, following the NVC naming convention.

NVC Name:

Scientific Name: *Quercus nigra – Quercus (alba, phellos*) Floodplain Forest
Colloquial Name: Eastern Highland Rim Water Oak Floodplain Forest

This natural community type encompasses the approximate northern half of the forested area in Section (Figure 11, Parcel A). The occurrence occupies a poorly defined, level floodplain along either side of Wheeler Branch, a shallow, swift flowing stream. Large tracts of the forest are seasonally flooded and are represented by the following suite of hardwoods in approximate decreasing order of abundance: water oak, willow oak, cherrybark oak, sweetgum, sugarberry, green ash (*Fraxinus pennsylvanica*), white oak, and shellbark hickory (*Carya laciniosa*). The canopy is mature, having a cover value of roughly 80% with an average dbh 20". Chinese privet appears to be the prominent species of the subcanopy/shrub layer, often having established nearly impenetrable thickets. Additional taxa of the shrub component include deciduous holly, pawpaw (*Asimina triloba*), American elm, box elder (*Acer negundo*), elderberry (*Sambucus canadensis*), and buckthorn bumelia (*Sideroxylon lycioides*), as well as saplings of the above-mentioned canopy species. Herbs are frequent but of low diversity, with the following appearing most conspicuous: bristly buttercup (*Ranunculus hispidus*), river oats (*Chasmanthium latifolium*), greater bladder sedge, spring beauty, cardinal flower (*Lobelia cardinalis*), and calico aster (*Symphyotrichum lateriflorum*); Japanese honeysuckle has become a well-established groundcover in some areas. Principal vines include poison ivy (*Toxicodendron radicans*), cross-vine (*Bignonia capreolata*), trumpet creeper, and various greenbriers (*Smilax* spp.).

Despite the heavy encroachment of Chinese privet and Japanese honeysuckle, portions of the parcel have a low to moderate probability of supporting state and federally listed flora. Species having the greatest potential are listed in Table 4.

Table 4. Rare and endangered taxa having low to good potential of occurring in the *Quercus nigra – Quercus* (*alba*, *phellos*) Floodplain Forest in Parcel A, Figure 11 based on habitat suitability.

Species Name	Common Name
Aplectrum hyemale	Puttyroot
Corallorhiza wisteriana	Spring Coralroot
Geum vernum	Springs Avens
Isotria verticillata	Large Whorled Pogonia
Lilium canadense	Canada Lily
Lilium michiganense	Michigan Lily
Lilium superbum	Turk's-cap Lily
Liparis liliifolia	Lily-leaved Twayblade
Pilea fontana	Spring Clearweed
Platanthera lacera	Ragged Fringed Orchid
Trillium pusillum var. *ozarkanum*	Ozark Least Trillium
Trillium recurvatum	Prairie Trillium
Triphora trianthophora	Three-birds Orchid

NVC Name:

Scientific Name: *Quercus falcata – Quercus alba – Carya tomentosa / Oxydendrum arboreum* Interior Low Plateau Woodland

Colloquial Name: Interior Low Plateau Southern Red Oak – White Oak Woodland

This association encompasses the approximate southern half of the forested area in Section 3 (Figure 11, Parcel B). The vegetation is characterized as a mature, closed-canopied (~85% coverage) upland hardwood forest typical of the Interior Low Plateau, an assemblage represented by southern hardwoods, most notably southern red oak, black oak (*Quercus velutina*), post oak, water oak, shagbark hickory, and to a slightly lesser extent, sweetgum, blackgum, mockernut hickory (*Carya tomentosa*), and black cherry. The average dbh for canopy species is 16". The shrub layer is fairly open (~35% coverage) and uniformly distributed, attaining its greatest development in canopy gaps and along forest margins. Principal taxa primarily include saplings of the foregoing canopy species in addition to a scattering of Chinese privet, tree sparkleberry (*Vaccinium arboreum*), and greenbriers, namely *Smilax glauca* and *S. rotundifolia*. The ground layer was poorly represented and of low diversity, with colonies of mayapple being most obvious. Additional species observed included longleaf spikegrass, Christmas fern, ebony spleenwort (*Asplenium platyneuron*), cranefly orchid, and wild comfrey.

The parcel is generally in good condition, with a minimal incursion of non-native invasive species and other forms of anthropogenic disturbance. It has a moderate suitability of containing the rare and endangered species presented in Table 5.

Table 5. Rare and endangered taxa having low to good potential of occurring in the *Quercus falcata – Quercus alba – Carya tomentosa / Oxydendrum arboreum* Interior Low Plateau Woodland in Parcel B, Figure 11 based on habitat suitability.

Species Name	Common Name
Aplectrum hyemale	Puttyroot
Corallorhiza wisteriana	Spring Coralroot
Isotria verticillata	Large Whorled Pogonia
Liparis liliifolia	Lily-leaved Twayblade
Nestronia umbellula	Nestronia
Orobanche uniflora	Cancer Root
Silene ovata	Ovate Catchfly
Trillium pusillum var. *ozarkanum*	Ozark Least Trillium
Trillium recurvatum	Prairie Trillium

Figure 11. Section 3 with corresponding parcels of semi-natural and natural vegetation.

Section 4

Section 4 is a small unit, chiefly consisting of agricultural lands. Two parcels capable of having limited potential of containing rare and endangered flora are identified, one as a semi-natural pine plantation and the other as a naturally occurring bottomland forest. Following NVC nomenclature, both are presented in greater detail below.

NVC Name:

Scientific Name: *Quercus nigra – Quercus (alba, phellos*) Floodplain Forest
Colloquial Name: Eastern Highland Rim Water Oak Floodplain Forest

This vegetation type covers a small area, largely along the eastern portion of the section's north boundary (Figure 11, Parcel A). The occurrence occupies poorly drained soils and is primarily represented by the following suite of hardwoods: willow oak, water oak, cherrybark oak, sweetgum, sugarberry, green ash, and an occasional overcup oak (*Quercus lyrata*), and shellbark hickory. The canopy is mature, having a cover value of roughly 80% with an average dbh 17". Chinese privet appears to be the prominent species of the subcanopy/shrub layer, often having established nearly impenetrable thickets. Additional taxa of the shrub component include deciduous holly, box elder, and elderberry, as well as saplings of the above-mentioned canopy species. Herbs are relatively sparse and of low diversity, with the following appearing most conspicuous: Cherokee sedge, greater bladder sedge, cardinal flower, and calico aster (*Symphyotrichum lateriflorum*); Japanese honeysuckle has become a well-established groundcover in some areas. Poison ivy, trumpet creeper, and various greenbriers (*Smilax* spp.) are common vines.

Despite the heavy encroachment of Chinese privet and Japanese honeysuckle, small portions of the parcel have a limited probability of supporting state and federally listed flora. Species having the greatest potential are presented in Table 6.

Table 6. Rare and endangered taxa having low to good potential of occurring in the *Quercus nigra – Quercus* (*alba*, *phellos*) Floodplain Forest in Parcel A, Figure 12 based on habitat suitability.

Species Name	Common Name
Corallorhiza wisteriana	Spring Coralroot
Geum vernum	Springs Avens
Isotria verticillata	Large Whorled Pogonia
Lilium canadense	Canada Lily
Lilium michiganense	Michigan Lily
Lilium superbum	Turk's-cap Lily
Liparis liliifolia	Lily-leaved Twayblade
Pilea fontana	Spring Clearweed
Platanthera lacera	Ragged Fringed Orchid
Trillium pusillum var. *ozarkanum*	Ozark Least Trillium

Trillium recurvatum	Prairie Trillium
Triphora trianthophora	Three-birds Orchid

NVC Name:

Scientific Name: *Pinus taeda* Forest Plantation

Colloquial Name: Loblolly Pine Plantation

This association is characterized as young mature, monospecific stands (Figure 12, Parcels B) of planted loblolly pine (*Pinus taeda*). Early successional hardwoods dominate the understory, with the following appearing most representative: red maple (*Acer rubrum*), sweetgum, water oak, and to a lesser extent, black gum (*Nyssa sylvatica*), black cherry, and winged elm (*Ulmus alata*). The shrub component is patchy and often dense, primarily consisting of nearly impenetrable thickets of Chinese privet in addition to saplings of the foregoing hardwood species. The groundcover is characterized by an abundance of trailing woody vines such as Japanese honeysuckle, poison ivy, and Virginia creeper (*Parthenocissus quinquefolia*), and a low diversity and sparse scattering of herbs, most notably Cherokee sedge (*Carex cherokeensis*) and longleaf grass (*Chasmanthium sessiliflorum*).

Owing to high levels of disturbance associated with establishing and managing pine plantations, the suitability for rare and endangered plant species is negligible. Table 7 presents a suite of taxa with low potential of occurring here.

Table 7. Rare and endangered taxa having limited potential of occurring in the loblolly pine plantation based on habitat suitability.

Species Name	Common Name
Celastrus scandens	Climbing Bittersweet
Frasera caroliniensis	American Columbo
Quercus macrocarpa	Bur Oak

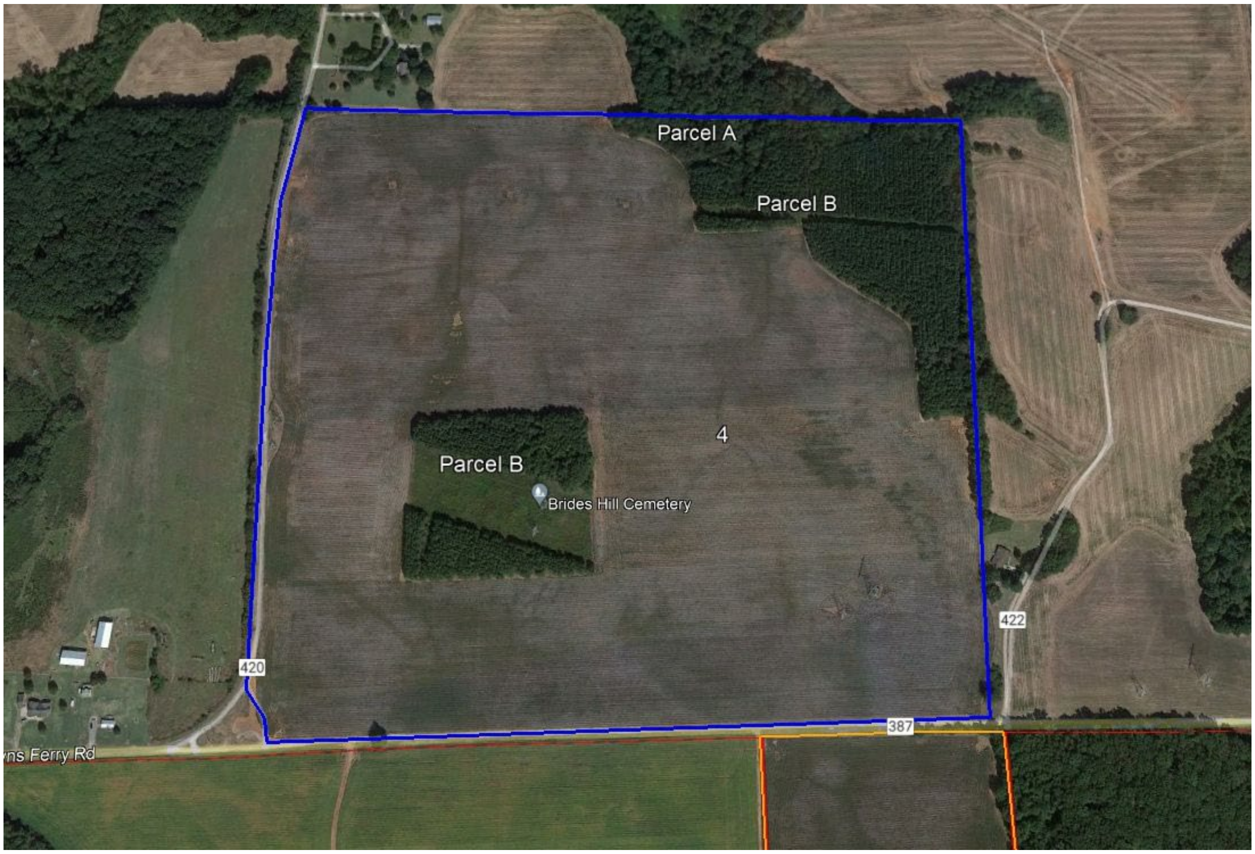

Figure 12. Section 4 with corresponding parcels of semi-natural and natural vegetation.

Section 5

Section 5 encompasses a large area represented by a mosaic of agricultural lands, successional fields, forested uplands, and various types of wetlands. Forested areas are largely comprised of hardwoods, accented with a scattering of pine. Owing to a long influence of human activity in the region, exotic flora is commonplace, with many taxa having greatly altered the landscape in terms of ecological processes and appearance. Several ecological associations capable of supporting federal and state listed flora have been identified and are described in greater detail below, following the naming convention of the NVC.

NVC Name:

Scientific Name: *Quercus nigra – Quercus (alba, phellos*) Floodplain Forest
Colloquial Name: Eastern Highland Rim Water Oak Floodplain Forest

This association covers large areas throughout Section 5, serving as the prominent vegetation type (Figure 15, Parcels A). Conforming to comparable examples elsewhere in the region, the occurrences occupy poorly drained soils and is primarily represented by the following suite of mature hardwoods: willow oak, water oak, cherrybark oak, sweetgum, and a lesser incidence of white oak, green ash, overcup oak, and shellbark hickory. The canopy is closed, having an average cover value of roughly 85% with a median dbh of 18” (Figure 13). The shrub component is generally patchy, chiefly comprised of saplings of the above-mentioned canopy species as well as deciduous holly, blackgum, box elder, and dense tangles of Chinese privet and round-leaved greenbrier (*Smilax rotundifolia*). The ground layer is sparse and typically patchy, characterized by colonies of poison ivy and Japanese honeysuckle as well as occasional Cherokee sedge, greater bladder sedge, butterweed (*Packera glabella*), and false nettle (*Boehmeria cylindrica*).

Despite the incursion of Chinese privet and Japanese honeysuckle, several areas render good ecological integrity and have a moderate to high probability of supporting a small number of state and federally listed flora. Species having the greatest potential are presented in Table 8.

Figure 13. Example of *Quercus nigra* – *Quercus* (*alba*, *phellos*) Floodplain Forest in Section 5.

Table 8. Rare and endangered taxa having moderate to high potential of occurring in the *Quercus nigra* – *Quercus* (*alba*, *phellos*) Floodplain Forest in Parcels A, Figure 15 based on habitat suitability.

Species Name	Common Name
Corallorhiza wisteriana	Spring Coralroot
Geum vernum	Springs Avens
Isotria verticillata	Large Whorled Pogonia
Lilium canadense	Canada Lily
Lilium michiganense	Michigan Lily
Lilium superbum	Turk’s-cap Lily
Liparis liliifolia	Lily-leaved Twayblade
Pilea fontana	Spring Clearweed
Platanthera lacera	Ragged Fringed Orchid
Trillium pusillum var. *ozarkanum*	Ozark Least Trillium
Trillium recurvatum	Prairie Trillium
Triphora trianthophora	Three-birds Orchid

NVC Name:

Scientific Name: *Quercus lyrata – Carya aquatica* Floodplain Forest
Colloquial Name: Overcup Oak – Water Hickory Bottomland Forest

Examples of this association are dominated by a partially open to closed canopy (65-85% coverage) of overcup oak, accented by a lesser incidence of willow oak, water oak, red maple, and sweetgum (Figure 14). The average dbh of canopy species is 17”. The shrub layer is variable in species composition and the degree of cover, with area of coverage extending from roughly 25-80%. Characteristic shrubs include deciduous holly, buttonbush (*Cephalanthus occidentalis*), parsley hawthorn (*Crataegus marshallii*), red chokeberry (*Aronia arbutifolia*), and immature examples of the foregoing canopy taxa. Due to the early seasonal timing of surveys, the herbaceous component is poorly discernible, with more frequently observed species including Iris (*Iris* sp.), various sedges (*Carex* spp.), cutgrass (*Leersia* sp.), and false nettle.

On-site occurrences (Figure 15, Parcels B) of this vegetation type are in generally good condition, having moderate to high potential of containing state and federally listed plant life. Taxa with the most promise appear in Table 9.

Figure 14. Example of *Quercus lyrata – Carya aquatica* Floodplain Forest in Section 5.

Table 9. Rare and endangered taxa having low to good potential of occurring in the *Quercus lyrata – Carya aquatica* Floodplain Forest in Parcels B, Figure 15 based on habitat suitability.

Species Name	Common Name
Carex oklahomensis	Oklahoma Sedge
Carex socialis	Social Sedge
Didiplis diandra	Water-Purslane
Elodea canadensis	Broad Waterweed
Geum vernum	Springs Avens
Iris prismatica	Slender Blue Iris
Ranunculus longirostris	Eastern White Water Crowfoot
Schoenoplectus subterminalis	Water Bulrush

NVC Name:

Scientific Name: *Quercus falcata – Quercus alba – Carya tomentosa / Oxydendrum arboreum* Interior Low Plateau Woodland

Colloquial Name: Interior Low Plateau Southern Red Oak – White Oak Woodland

An example of this association occurs proximal to the center of Section 5 (Figure 15, Parcel C). The canopy is mature and closed (~85% coverage) and is characterized by a mix of southern hardwoods with inclusions of shortleaf and loblolly pines. The hardwood component is characteristic of the Interior Low Plateau, with the following species appearing most representative: southern red oak, black oak, post oak, water oak, mockernut hickory, shagbark hickory, and to a slightly lesser extent, sweetgum, tuliptree (*Liriodendron tulipifera*), blackgum, and black cherry. The average dbh for canopy species is 18". The shrub layer is patchy and relatively open (~40% coverage), assuming its best development in canopy gaps and along forest margins. Principal taxa primarily include saplings of the foregoing canopy species in addition to thickets of Chinese privet, deciduous holly, occasional sassafras (*Sassafras albidum*), and patches of greenbriers, most notably *Smilax rotundifolia*. Apart from patches of Japanese honeysuckle, the ground layer was sparse, consisting of widely scattered wild comfrey, colonies of mayapple, spotted wintergreen (*Chimaphila maculata*), cranefly orchid, longleaf spikegrass, Christmas fern, and ebony spleenwort.

Notwithstanding frequent patches of Japanese honeysuckle and Chinese privet, the natural community occurrence is generally in good condition. It has a moderate suitability of containing a small number of rare and endangered species presented in Table 10.

Table 10. Rare and endangered taxa having low to good potential of occurring in the *Quercus falcata – Quercus alba – Carya tomentosa / Oxydendrum arboreum* Interior Low Plateau Woodland in Parcel C, Figure 15 based on habitat suitability.

Species Name	Common Name
Aplectrum hyemale	Puttyroot
Celastrus scandens	American Bittersweet
Corallorhiza wisteriana	Spring Coralroot
Isotria verticillata	Large Whorled Pogonia
Liparis liliifolia	Lily-leaved Twayblade
Nestronia umbellula	Nestronia
Orobanche uniflora	Cancer Root
Silene ovata	Ovate Catchfly
Trillium pusillum var. *ozarkanum*	Ozark Least Trillium
Trillium recurvatum	Prairie Trillium

NVC Name:

Scientific Name: *Pinus taeda* Forest Plantation
Colloquial Name: Loblolly Pine Plantation

This association is represented by a small number of young mature, monospecific stands of loblolly pine (Figure 15, Parcels D) of planted loblolly pine (*Pinus taeda*). Shrubs and immature hardwoods characterize the understory, with the following assuming prominence: red maple (*Acer rubrum*), sweetgum, water oak, black gum, black cherry, winged elm, Japanese honeysuckle, and dense thickets of Chinese privet. Because of dense shade, the groundcover is often sparse, with poison ivy, Virginia creeper, and Japanese honeysuckle appearing prominent.

Owing to high shade density and the abundance of non-native invasive species, the suitability for rare and endangered plant species is negligible.

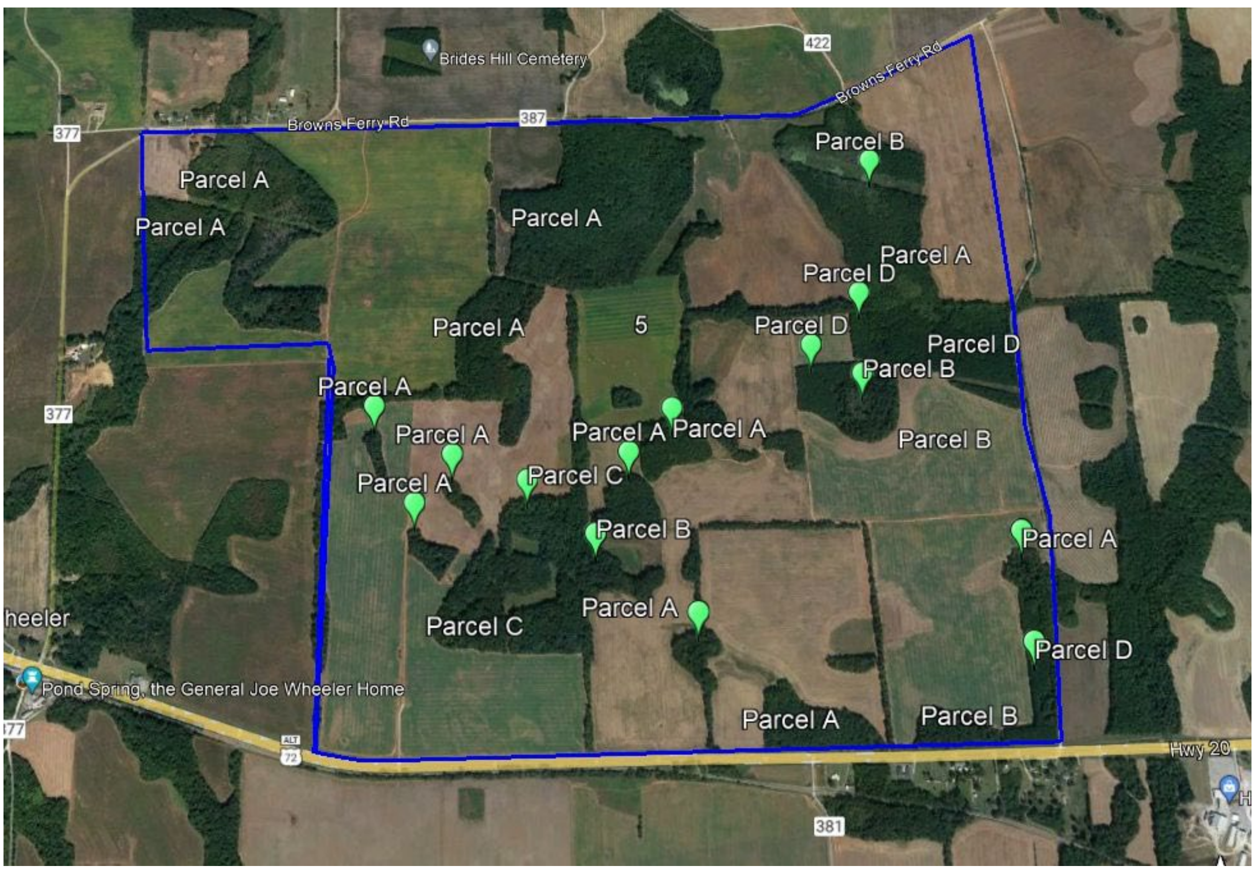

Figure 14. Section 5 with corresponding parcels of semi-natural and natural vegetation.

Powerline Corridor

The powerline corridor (Figure 16) extending from the northern boundary of the project area northwest to the Tennessee River primarily traverses agricultural lands. There is no potential for state and federally listed to occur within the corridor.

Figure 16. Powerline corridor traversing agricultural lands.

LITERATURE CITED

NatureServe. 2024. NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: April 2, 2024).

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Appendix C – Cultural Resources-Related Correspondence and Supporting Information

TENNESSEE VALLEY AUTHORITY
400 West Summit Hill Drive, Knoxville, Tennessee 37902

January 16, 2024

Ms. Lee Anne Wofford
Deputy State Historic Preservation Officer
Alabama Historical Commission
468 South Perry Street
Montgomery, Alabama 36130-0900

Dear Ms. Wofford:

TENNESSEE VALLEY AUTHORITY (TVA), INITIATION OF CONSULTATION, HILLSBORO SOLAR PROJECT, LAWRENCE COUNTY, ALABAMA (TVA Tracking Number – CRMS 77036888876) (34.66633 -87.27017)

In March of 2023, TVA sent an initiation of consultation letter to your office regarding seven potential solar projects in Alabama. Your office expressed concerns about one of the projects located in Lawrence County, Alabama in the vicinity of National Register listed Pond Springs and Bride's Hill Plantations (*Potential Alabama Project 1*, now called Hillsboro). By this letter, we are notifying your office that TVA is considering entering into a power purchase agreement with Urban Grid to construct, operate, and maintain a 200-megawatt alternating current solar facility that would occupy approximately 1,500 acres of the 3,831.9 -acre project study area. In support of the project TVA proposes to loop the existing Wheeler-Nance-Trinity 161-kV Transmission Line into the new Brides Hill Switching Station and replace overhead ground wire with optical ground wire in selected spans and reconductor the existing 12.2-mile-long Wheeler-Brides Hill 161-kV Transmission Line.

TVA determined the area of potential effects (APE) to be the footprint where ground disturbance could occur as a result of the undertaking as well as the 0.5-mile radius of the project area and within the visual line of site that may have a visual effect to historic properties.

Urban Grid contracted with Tennessee Valley Archaeological Research (TVAR) to conduct a Phase I cultural resources survey. Attached for your review and comment is the site-specific research design for the survey based on TVA's high-level scope of work provided to your office in our March 2023 consultation. Pursuant to 36 CFR § 800.4(b)(1), TVA finds that the survey design presented here is a reasonable and good faith effort to carry out identification efforts.

TVA is providing you an update on the proposed project and providing you TVAR's research design for your review and comment.

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

Please contact Michaelyn Harle by email, mharle@tva.gov with your comments.

Sincerely,

Michaelyn Harle
Manager, Cultural Projects Reviews
Cultural Compliance

MSH:ERB

Phase I Historic Architectural Survey for a Proposed Solar Photovoltaic Facility, Lawrence County, Alabama (Hillsboro Solar)

Tennessee Valley Archaeological Research

Phase I Archaeological Survey for a Proposed Solar Photovoltaic Facility, Lawrence County, Alabama (Hillsboro Solar) Volume I

Tennessee Valley Archaeological Research

Phase I Archaeological Survey for a Proposed Solar Photovoltaic Facility, Lawrence County, Alabama (Hillsboro Solar) Volume II

Tennessee Valley Archaeological Research

Appendix D – Scoping Documentation and Public Comments

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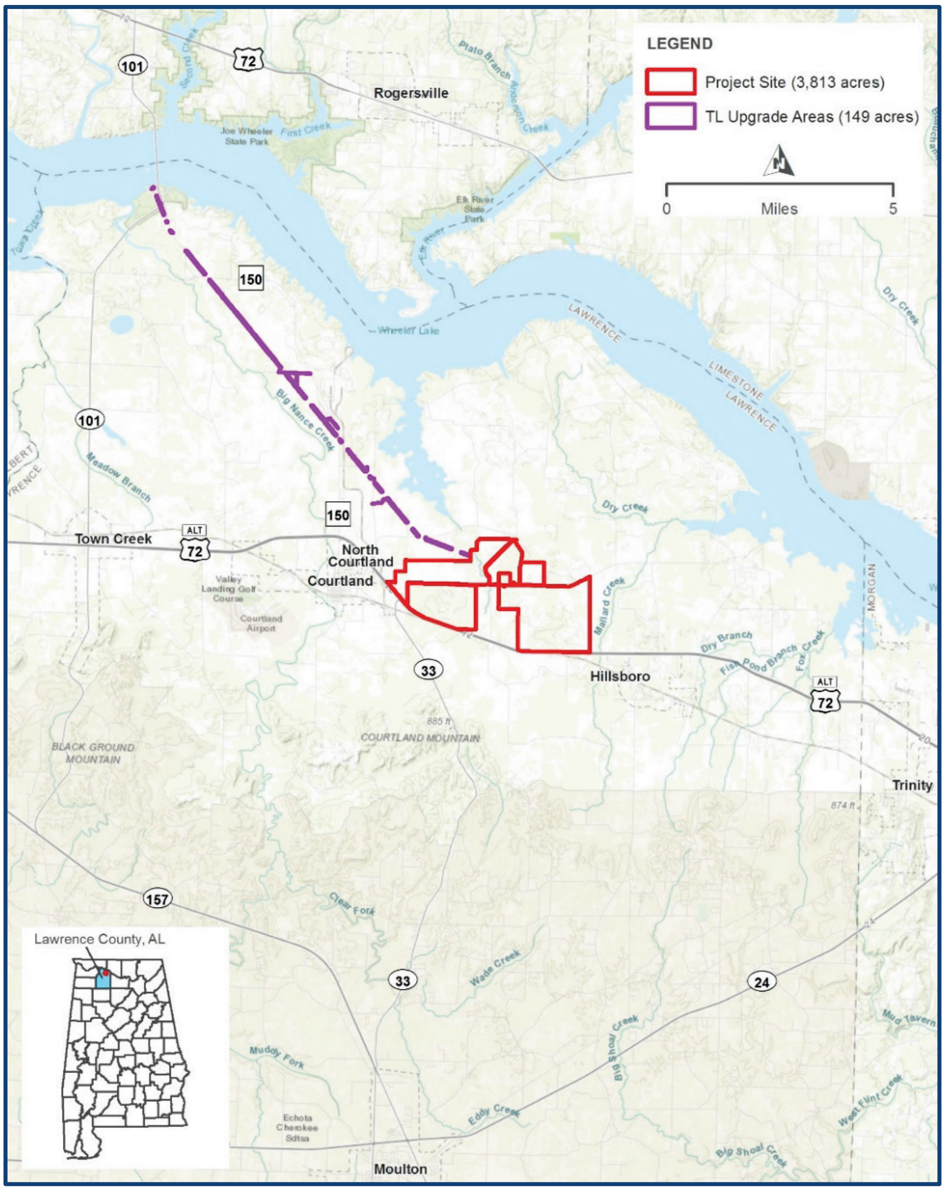
Hillsboro III Solar
Environmental Impact Statement

SCOPING REPORT

OCTOBER 27, 2023



TENNESSEE VALLEY AUTHORITY

Scoping Report Executive Summary

Tennessee Valley Authority (TVA) is preparing an environmental impact statement (EIS) to assess the potential environmental effects of a proposed solar photovoltaic (PV) facility in Lawrence County, Alabama, known as Hillsboro III Solar. The solar facility would be constructed within a Project site measuring approximately 3,813 acres, of which approximately 1,500 acres are necessary to develop the 200-megawatt (MW) alternating current (AC) solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama (Figure 1). Hillsboro III Solar would connect to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), which runs through the Project site, and require upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL. Together, the solar facility and the TL upgrades are referred to herein as the Project.

In June 2019, TVA completed the final 2019 Integrated Resource Plan (IRP) and associated EIS. The IRP is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. 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.

Customer demand for cleaner energy prompted TVA to release a Request for Proposal (RFP) for renewable energy resources (2022 Carbon-Free RFP). TVA is considering entering into a Power Purchase Agreement (PPA) with Urban Grid Solar to purchase 200 MW AC of power generated by the Project. This PPA will help TVA meet immediate needs for additional renewable generating capacity in response to customer demands and help fulfill the renewable energy goals established in the 2019 IRP. The PPA is contingent upon the completion of an environmental review. The subject EIS will address the potential environmental effects associated with constructing, operating, maintaining, and decommissioning the proposed solar PV facility in order to inform TVA's decision-making and involve the public in it.

The EIS will assess a No Action Alternative and an Action Alternative. In evaluating alternatives, TVA considered other solar proposals prior to selecting the Hillsboro III site for further evaluation. Part of the screening process included a review of transmission options, including key connection points to TVA's transmission system. The Hillsboro III site stood out as a viable option for connectivity. The Action Alternative would execute the PPA to purchase 200 MW AC of power generated by the proposed solar PV facility. Urban Grid Solar would construct, operate, maintain, and eventually decommission the solar PV facility, as described above, within a footprint that avoids environmental resources to the maximum extent possible. Under the No Action Alternative, TVA would not execute the PPA, and Urban Grid Solar would not develop, operate, maintain, or decommission a solar PV facility at this location.

The National Environmental Policy Act (NEPA) requires federal agencies to consider the potential environmental consequences of their proposed actions. An EIS should provide full and fair discussion of significant environmental impacts and should inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts. TVA initiated a 30-day public scoping period on September 1, 2023, when it published a Notice of Intent in the *Federal Register* announcing its plan to prepare an EIS. During the scoping period the public provided input to help TVA identify issues of concern and to help lay the foundation for development of the EIS. In particular, TVA requested comments on other reasonable alternatives that should be assessed in the EIS. This scoping report presents the public comments received, as well as information on how the EIS is being developed.

During the scoping period, TVA received comments from two federal agencies and four private individuals. Comments were related to alternatives; component sourcing; decommissioning and waste management; land use; soils and prime farmland; water resources; biological resources; natural areas, parks, and recreation; visual resources; cultural resources; socioeconomics; environmental justice; and cumulative impacts. This scoping report also includes information about NEPA, federal and local laws, and executive orders that are relevant to the proposed action.

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AC	Alternating current
ADEM	Alabama Department of Environmental Management
BMP	Best management practice
CBMPP	Construction Best Management Practices Plan
CFR	Code of Federal Regulations
DC	Direct current
EIS	Environmental Impact Statement
EO	Executive Order
GHG	Greenhouse gas
IRP	Integrated Resource Plan
kV	Kilovolt
MVT	Medium voltage transformer
MW	Megawatt
NEPA	National Environmental Policy Act
NOI	Notice of Intent
PPA	Power purchase agreement
PV	Photovoltaic
RFP	Request for proposal
TL	Transmission line
TVA	Tennessee Valley Authority
U.S.	United States
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

1 Introduction

Tennessee Valley Authority (TVA) is a self-financed, wholly owned corporate agency of the United States (U.S.) that serves a region that consists of parts of seven Southeastern states. As a public power entity, TVA has no shareholders and receives no tax dollars. Under the TVA Act of 1933, as amended, Congress charged TVA with advancing the social and economic well-being of the residents of the Tennessee Valley region. TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. In June 2019, TVA completed the final 2019 Integrated Resource Plan (IRP) and associated Environmental Impact Statement (EIS). The IRP is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. The target supply mix adopted by TVA in the 2019 IRP recommends solar expansion in all scenarios analyzed, with most scenarios anticipating 5,000–8,000 megawatts (MW) and one anticipating up to 14,000 MW by 2038.

Customer demand for cleaner energy prompted TVA to release a Request for Proposal (RFP) for renewable energy resources (2022 Carbon-Free RFP). As an outcome of this RFP process, TVA is considering entering into a Power Purchase Agreement (PPA) with Urban Grid Solar to purchase 200 MW alternating current (AC) of power generated by the proposed solar photovoltaic (PV) facility contingent upon the completion of an environmental review. The facility, known as Hillsboro III Solar, would be located within an approximately 3,813-acre Project site in Lawrence County, Alabama. Urban Grid Solar would construct, operate, maintain, and eventually decommission Hillsboro III Solar. A substation and facilities to interconnect the solar PV facility to the TVA Trinity–Nance 161-kilovolt (kV) transmission line (TL), as well as upgrades on approximately five miles of this TL and approximately seven miles of the TVA Wheeler HP–Nance 161-kV TL, would also be required to operate the solar facility. Together, the solar facility and the TL upgrades are referred to herein as the Project.

The Project site consists of 3,813 acres, of which approximately 1,500 acres would be necessary to develop the solar facility. The Project site is located along the north side of U.S. Highway 72 Alternate between Courtland and Hillsboro, Alabama. The Project site is mostly farmland with areas of woody wetlands and deciduous forest. The land surplus is to accommodate relocating the Project components to avoid or minimize impacts to wetlands and other sensitive environmental resources. TVA's Trinity–Nance 161-kV TL extends east-west through the Project site.

TVA is preparing the subject EIS to assess the potential environmental impacts associated with constructing, operating, maintaining, and decommissioning the Project.

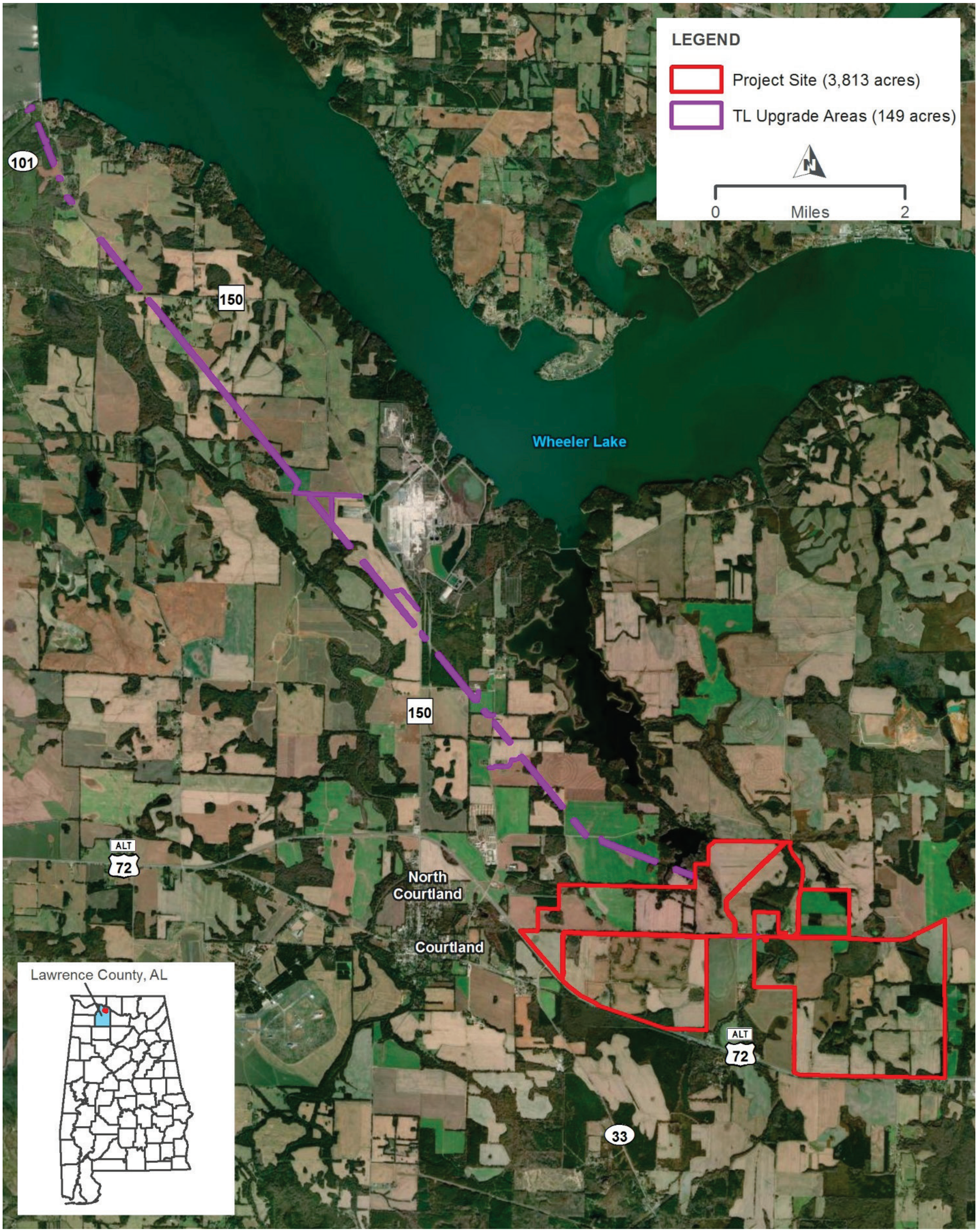


Figure 1. Project Location.

2 Purpose and Need

Customer demand for cleaner energy prompted TVA to release an RFP for renewable energy resources (2022 Carbon-Free RFP). The purpose of the proposed action—TVA's approval of the PPA and the associated construction and operation of the Hillsboro III Solar project—is to help TVA meet immediate needs for additional renewable generating capacity in response to customer demands and fulfill the renewable energy goals established in the 2019 IRP.

3 Alternatives

As a result of preliminary internal scoping by TVA and comments received during public scoping, TVA has determined that, from the standpoint of NEPA, there is one reasonable alternative, the Action Alternative (the proposed action), which meets the purpose and need. As required by NEPA, the EIS will also address the No Action Alternative. Variations of the Action Alternative that TVA considered but eliminated from detailed study will be described in the EIS.

3.1 No Action Alternative

Under the No Action Alternative, TVA would not execute the PPA, and Urban Grid Solar would not develop, operate, maintain, and decommission Hillsboro III Solar. Existing conditions (land use, natural resources, visual resources, physical resources, and socioeconomics) on the Project site and in the vicinity would remain unchanged. TVA would continue to rely on other sources of generation described in the 2019 IRP to ensure an adequate energy supply and to meet its goals for increased renewable energy and low greenhouse gas (GHG)-emitting generation.

3.2 Action Alternative

Under the Action Alternative, TVA would execute the PPA to purchase 200 MW AC of power generated by the proposed solar PV facility. The facility would be located within the approximately 3,813-acre Project site in Lawrence County, Alabama (Figure 1). Urban Grid Solar would construct, operate, maintain, and decommission the solar facility within a 1,500-acre footprint that avoids cultural, biological, and physical resources to the maximum extent possible. The Project would connect to TVA's existing adjacent Trinity–Nance 161-kV TL that extends east-west through the Project site. To interconnect to TVA's existing electrical grid, TVA would build an on-site 161-kV substation, if necessary, and replace the existing overhead ground wire with new fiber-optic overhead ground wire along an approximately five-mile portion of the Trinity–Nance 161-kV TL and an approximately seven-mile portion of the TVA Wheeler HP–Nance 161-kV TL.

The Project would convert sunlight into direct current (DC) electrical energy within PV panels (modules). 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.

The Project would be composed of PV modules mounted together in arrays. Groups of panels would be connected electrically in series to form "strings" of panels, with the maximum string size chosen to ensure that the maximum inverter input voltage is not exceeded by the string voltage at the Project's high design temperature. The panels would be arranged in individual blocks consisting of the PV arrays and an inverter station on a concrete pad or steel piles, to convert the DC electricity generated by the solar panels into AC electricity. Each inverter would be collocated with a medium voltage transformer (MVT), which would step-up the AC voltage to minimize the AC cabling electrical losses between the central inverters and the potential on-site 161-kV substation. Underground AC power cables would connect the MVTs to a single main power transformer, located within the potential on-site substation. The arrays and inverter block areas would be enclosed by chain-link security fencing. The portions of the Project site outside the fenced-in areas would not be developed.

The modules would be attached to single-axis trackers. The axis trackers would be attached to steel pile foundations and pivot the panels along their north-south axes to follow the path of the sun from the east to the west across the sky.

Other temporary or permanent Project components would include construction laydown areas, buildings, and security and communications equipment. Also, if determined necessary, the Project may include water wells and a septic system or a pump-out septic holding tank. Compacted gravel access roads would provide access to each inverter block, the potential on-site substation, and to any buildings.

4 Environmental Review Process

NEPA requires federal agencies to consider and study the potential environmental consequences of their proposed actions. Actions, in this context, can include new and continuing activities that are conducted, financed, assisted, regulated, or approved by federal agencies, as well as new or revised plans, policies, or procedures. An EIS should provide full and fair discussion of significant environmental impacts and should inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment.

TVA is initiating the preparation of this EIS to assess the environmental impacts of the proposed action. TVA is using the input from the public scoping period in developing the Draft EIS. The Draft EIS will be posted on TVA's website and distributed to interested federal, state, and local agencies, individuals, and groups, including scoping participants, for their review and comment. Following the public comment period, TVA will respond to the comments received and incorporate any necessary changes into the Final EIS. TVA will make a final decision regarding the proposed action no sooner than 30 days after the Final EIS is published.

The completed Final EIS will be posted on TVA's website, and notices of its availability will be sent to those who received the Draft EIS or submitted comments on the Draft EIS. TVA intends to publish the Draft EIS in late 2024 and publish the Final EIS in late 2025.

4.1 Applicable Federal Laws and Executive Orders

4.1.1 National Environmental Policy Act

This EIS is being prepared by TVA in accordance with NEPA (42 U.S. Code §§ 4321 et seq.), regulations implementing NEPA promulgated by the Council on Environmental Quality (40 Code of Federal Regulations [CFR] Parts 1500 to 1508), and TVA NEPA regulations (18 CFR 1318) and procedures.

4.1.2 Other Laws and Executive Orders

Other laws and Executive Orders (EOs) are relevant to the proposed action (Table 1). These laws and orders may affect the environmental consequences of the solar PV facility or represent measures to implement during its construction, operation, or decommissioning. The Draft EIS will describe the regulatory setting for each environmental resource in more detail.

Table 1. Laws and Executive Orders relevant to the proposed action.

Environmental Resource	Law / Executive Order
Prime Farmland	Farmland Protection Policy Act
Water Resources	Alabama Department of Environmental Management (ADEM) Administrative Code, Chapter 335-6 Clean Water Act EO 11988 – Floodplain Management EO 11990 – Protection of Wetlands Resource Conservation and Recovery Act Safe Drinking Water Act
Biological Resources	Alabama Department of Conservation and Natural Resources Administrative Code, Chapter 220-4 Bald and Golden Eagle Protection Act Endangered Species Act EO 13112 – Invasive Species EO 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds Migratory Bird Treaty Act
Air Quality and GHG Emissions	ADEM Administrative Code, Chapter 335-3 Clean Air Act
Cultural Resources	National Historic Preservation Act Native American Graves Protection and Repatriation Act
Waste Management	ADEM Administrative Code, Chapter 335-13 and 14 Comprehensive Environmental Response, Compensation, and Liability Act Emergency Planning and Community Right-to-Know Act Resource Conservation and Recovery Act Solid Waste Disposal Act Toxic Substances Control Act
Public and Occupational Health and Safety	Occupational Safety and Health Act
Environmental Justice	EO 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations EO 14096 – Revitalizing Our Nation’s Commitment to Environmental Justice for All

4.2 Environmental Resources to Be Considered in EIS

Based on internal and public scoping, identification of applicable laws, regulations, EOs, and policies, TVA identified the following resource areas as requiring review within the EIS:

- Land Use
- Geology, Soils, and Prime Farmland
- Water Resources
    - Groundwater
    - Surface Water and Wetlands
    - Floodplains
- Biological Resources
    - Vegetation
    - Wildlife
    - Aquatic Life
    - Threatened and Endangered Species
- Natural Areas, Parks, and Recreation
- Visual Resources
- Noise
- Air Quality and GHG Emissions
- Cultural Resources
- Utilities
- Waste Management
- Public and Occupational Health and Safety
- Transportation
- Socioeconomics
- Environmental Justice

5 Public Outreach during Scoping Period

On September 1, 2023, TVA published a Notice of Intent (NOI) in the *Federal Register* announcing that it planned to prepare an EIS to assess the potential environmental impacts associated with constructing, operating, maintaining, and decommissioning the Project (Appendix A). The NOI initiated a 30-day public scoping period, which concluded on October 2, 2023. The NOI solicited public input on both the scope of the EIS and the environmental issues that should be considered in the EIS. It also requested data, information, and analyses relevant to the proposed action. In addition to the NOI in the *Federal Register*, TVA sent notification of the NOI to local and state government entities and federal agencies; issued a Project news release via local media serving the Lawrence County area, including WALW-FM radio, *The Moulton Advertiser*, *Times Daily*, *Decatur Daily*, *Huntsville Real-Time News* (AL.com), and the *News Courier*; and posted the news release on TVA's website. TVA sent the scoping notice via email to agencies and organizations.

6 Summary of Public Scoping Comments

Comments were received from the National Park Service, the U.S. Environmental Protection Agency (USEPA), and four private individuals. Comment submissions are included in Appendix B and summarized by topic below.

6.1 Scope of the EIS

TVA will analyze the potential adverse and beneficial impacts related to the construction, operation, maintenance, and decommissioning of the Project, including the associated modifications to the TVA transmission system. In addition to the environmental resources listed in Section 4.2, TVA will analyze the cumulative impacts of the Project with consideration of any reasonably foreseeable actions and other anticipated changes in the vicinity of the Project site during the operation of the solar facility.

6.2 Response to TVA Scoping Comments

Comments were received regarding several topics. A summary of how TVA plans to approach these items is provided below.

Alternatives

TVA is committed to increasing its use of clean, non-carbon emitting generation, while maintaining a reliable, low-cost, power system. To achieve this, and in response to customer demand, TVA has established goals for additional renewable generating capacity, including solar energy. Customer demand for cleaner energy prompted TVA to release an RFP for renewable energy resources (2022 Carbon-Free RFP). The PPA associated with the Project that resulted from this RFP will help TVA meet immediate needs for additional renewable generating capacity. In general, the cost for distributed generation, such as rooftop solar, is higher than utility-scale generation.

In evaluating alternatives, TVA considered other solar proposals, prior to selecting the Hillsboro III site for further evaluation. Part of the screening process included a review of transmission options, including key connection points to TVA's transmission system. The Hillsboro III site stood out as a viable option for connectivity. The EIS will describe the site selection process completed during Project planning.

Component Sourcing
The EIS will address the sourcing of the solar panels and other components.

Decommissioning and Waste Management
The EIS will describe the decommissioning process and waste management methods, including the estimated operational lifespan of the solar panels and other components and the recycling or disposal process.

Land Use
TVA will evaluate if development of the Project site as a solar facility is compatible with current land use regulations. Potential impacts from changing land use within the Project site from mostly farmland with areas of woody wetlands and deciduous forest to industrial will be discussed in the EIS.

Soils and Prime Farmland
Potential impacts to soils and prime farmland will be discussed in the EIS.

Water Resources
Potential impacts to water resources, including water quality, waters of the U.S., and floodplains will be discussed in the EIS.

Biological Resources
Potential impacts to wildlife, vegetation, aquatic life, and threatened and endangered species will be analyzed in the EIS.

Natural Areas, Parks, and Recreation
Potential impacts to natural areas, parks, and recreation will be discussed in the EIS.

Visual Resources
Potential impacts to visual resources will be discussed in the EIS.

Cultural Resources
Potential impacts to cultural resources will be discussed in the EIS, including impacts to the adjacent or nearby Trail of Tears, Bride's Hill and the Joseph Wheeler Plantation National Register sites, and the Muscle Shoals National Heritage Area.

Socioeconomics and Environmental Justice
Socioeconomic and environmental justice consequences will be discussed in the EIS. The EIS will use appropriate tools, such as EJScreen, to assess environmental justice in minority populations and low-income populations. This will include consideration of existing pollution, social, economic, or health burdens and targeted community engagement regarding environmental justice populations.

Cumulative Impacts
TVA will assess the potential for cumulative impacts of the solar facility when considered together with past, present, and reasonably foreseeable future actions in the vicinity of the Project site. These will include other proposed TVA solar facilities in northwest Alabama and other nearby industrial development.

7 Potential Mitigation Measures

TVA and Urban Grid Solar would implement minimization and mitigation measures in relation to resources potentially affected by the Project. These would be developed with consideration to best management practices (BMPs), permit requirements, and adherence to the Construction Best Management Practices Plan (CBMPP).

In association with the proposed electrical interconnection, TVA would employ standard practices and specific routine measures to avoid and minimize impacts to resources. Some comments received during the scoping period offered specific mitigation measures for the proposed action. During development of the EIS, TVA will consider implementation of the following minimization and mitigation measures in relation to potentially affected resources.

Soils
Install silt fence along the perimeter of vegetation-cleared areas, implement other soil stabilization and vegetation management measures to reduce the potential for soil erosion during site operations, and make an effort to

balance cut-and-fill quantities to alleviate the transportation of soils off-site during construction.

Water Resources
Comply with the terms of the CBMPP prepared as part of the National Pollutant Discharge Elimination System permitting process; use BMPs for controlling soil erosion and runoff, such as the use of buffer zones surrounding perennial and intermittent streams as well as wetlands and natural ponds and the installation of erosion control silt fences and sediment traps; and implement other routine BMPs as necessary, such as non-mechanical tree removal within surface water buffers, placement of silt fence and sediment traps along buffer edges, selective herbicide treatment to restrict application near receiving water features, and proper vehicle maintenance to reduce the potential for adverse impacts to surface water and groundwater. Impacts to water resources deemed jurisdictional to the ADEM and U.S. Army Corps of Engineers would be permitted in compliance with the Clean Water Act Sections 401 and 404. The Project would also implement mitigation measures as defined in TVA's 1981 *Class Review of Repetitive Actions in the 100-Year Floodplain*, if needed.

Biological Resources
Revegetate with perennial and annual, non-invasive vegetation to reintroduce habitat, reduce erosion, and limit the spread of invasive species (per EO 13112, Invasive Species); comply with requirements of the U.S. Fish and Wildlife Service (USFWS) in accordance with the Endangered Species Act; implement inactive season tree clearing, if required by USFWS, to minimize impacts to migratory birds and bats; use only USEPA-registered and TVA-approved herbicides in accordance with label directions designed in part to restrict applications near receiving waters and to prevent unacceptable aquatic impacts in areas requiring chemical treatment; and coordinate with U.S. Department of Agriculture and/or USFWS if active osprey and eagle nests are identified during aerial nest surveys of the TL upgrade locations to develop avoidance and minimization measures and ensure compliance under federal law prior to commencement of the TL upgrade activities.

Visual Resources
Use timer- and/or motion-activated downward facing lighting to limit visual effects at night.

Noise
Limit construction activities primarily to daytime hours and ensure that heavy equipment, machinery, and vehicles utilized at the Project site meet all federal, state, and local noise requirements.

Air Quality and GHG Emissions
Comply with local ordinances or burn permits and avoid burning on days air quality alerts have been issued, as much as feasible, if burning of vegetative debris is required and use BMPs such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust.

Waste Management
Develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials.

Public and Occupational Health and Safety
Implement BMPs for site safety management to minimize potential risks to workers.

Transportation
Post a flag person during heavy commute periods, prioritize access for local residents, and implement staggered work shifts during daylight hours to manage construction traffic flow near the Project site.

A

Appendix A – *Federal Register* Notice of Intent

Preliminary Proposed Action and Alternatives

TVA has initially identified four alternatives for evaluation in the PEIS associated with the proposed pumped storage hydro facilities. These include a No Action Alternative and three Action Alternatives. Under the No Action Alternative, TVA will evaluate and consider the impact of not including additional PSH in TVA's energy storage fleet. TVA will evaluate and consider each of the Action Alternatives to determine which site(s) are best suited for pumped storage. The Action Alternatives will include the expansion of the existing PSH facility at Raccoon Mountain, constructing a new facility near Pisgah, Alabama (Rorex Creek), and constructing a new facility near Fabius, Alabama (Widows Creek). Both new facilities would be located within Jackson County, Alabama.

The description and analysis of these alternatives in the PEIS will inform decision makers, other agencies, and the public about the potential for environmental impacts associated with the proposed PSH facilities. TVA solicits comment on whether there are other alternatives that should be assessed in the PEIS. TVA also requests information and analyses that may be relevant to the project.

Anticipated Environmental Impacts

Public scoping is integral to the process for implementing NEPA and ensures that (1) issues are identified early and properly studied, (2) issues of little significance do not consume substantial time and effort, and (3) the analysis of identified issues is thorough and balanced. This PEIS will identify the purpose and need of the Action Alternatives and will contain descriptions of the existing environmental and socioeconomic resources within the area that could be affected by the proposed project. Evaluation of potential environmental impacts to these resources will include, but not be limited to, water resources, biological resources, cultural resources, natural areas and recreation, navigation, utilities, recreation, geology and groundwater, air quality and climate change, greenhouse gas emissions, land use and prime farmland, noise, public health and safety, socioeconomics and environmental justice, solid and hazardous waste and material, transportation, and visual resources. The PEIS will analyze measures that would avoid, minimize, or mitigate environmental effects.

The final range of issues to be addressed in the environmental review will be determined, in part, from scoping comments received. TVA is particularly interested in public input on other reasonable alternatives that should be considered in the PEIS. The preliminary identification of reasonable alternatives and environmental issues in this notice is not meant to be exhaustive or final.

Anticipated Permits and Other Authorizations

TVA anticipates consulting with the required authorities including, but not limited to: the Endangered Species Act; Bald and Golden Eagle Protection Act; Rare Species Protection and Conservation Act; National Historic Preservation Act; Clean Air Act; and Federal Clean Water Act.

TVA anticipates seeking required permits or authorizations as appropriate, from the following governmental entities: U.S. Army Corps of Engineers; U.S. Environmental Protection Agency; Alabama Department of Environment and Conservation; Tennessee Department of Environment and Conservation; U.S. Fish and Wildlife Service; Alabama State Historic Preservation Officer; Tennessee State Historic Preservation Officer; and Tribal Historic Preservation Officers. This is not an exhaustive list, other permits or authorizations may be sought as required or appropriate.

Public Participation and Scoping Process

The public is invited to submit comments on the scope of the PEIS no later than the date identified in the **DATES** section of this notice. Federal, state, and local agencies and Native American Tribes are also invited to provide comments. Information about this project is available on the TVA web page at *https://www.tva.gov/nepa,* including a link to an online public comment page.

SEIS Preparation and Schedule

Any comments received, including names and addresses, will become part of the administrative record and will be available for public inspection. After consideration of comments received during the scoping period, TVA will develop a scoping document that will summarize public and agency comments that were received and identify the schedule for completing the PEIS process.

Following analysis of the resources and issues, TVA will prepare a draft PEIS for public review and comment tentatively scheduled for late 2024/early 2025; the final PEIS and decision is tentatively scheduled for 2025. In finalizing the PEIS and in making its final decision, TVA will consider the comments that it receives on the draft PEIS. A final determination on proceeding with the preferred alternative will be documented in a Record of Decision.

Authority: 40 CFR 1501.9.

Susan Jacks,

General Manager, Environmental Resource Compliance.

[FR Doc. 2023–10653 Filed 5–18–23; 8:45 am]

BILLING CODE 8120–08–P

TENNESSEE VALLEY AUTHORITY

Solar and Battery Programmatic Environmental Impact Statement

AGENCY: Tennessee Valley Authority.

ACTION: Notice of intent.

SUMMARY: TVA is working to build an energy system powered by cleaner, more flexible energy, and solar and storage will play a big role. TVA has an expansion target of 10,000 megawatts (MW) of solar by 2035. TVA has identified the need to respond more efficiently and effectively to the growing number of solar and battery projects that will be required to achieve TVA's overall decarbonization goals and aspirations. To meet its obligations under the National Environmental Policy Act (NEPA), TVA is preparing a Programmatic Environmental Impact Statement (PEIS) to develop new guidance and a bounding analysis that will further facilitate solar energy and battery energy storage development on TVA-owned and private lands within the TVA service area. TVA would consider this guidance, including recommended environmental practices and mitigation measures, in its decision-making processes.

DATES: To ensure consideration, comments on the scope, alternatives being considered, and environmental issues must be postmarked, emailed, or submitted online no later than June 20, 2023.

ADDRESSES: Written comments should be sent to Elizabeth Smith, NEPA Compliance Specialist, 400 West Summit Hill Dr., WT 11B, Knoxville, TN 37902–1499. Comments may also be submitted online at: *https://www.tva.gov/NEPA* or by email at *NEPA@tva.gov*.

FOR FURTHER INFORMATION CONTACT: For general information about the NEPA process and/or general project information, please contact Elizabeth Smith, NEPA Compliance Specialist, email: *esmith14@tva.gov,* or contact by phone at 865–632–3053.

SUPPLEMENTARY INFORMATION: This notice is provided in accordance with the Council on Environmental Quality's Regulations (40 CFR parts 1500 to 1508) and TVA's procedures for implementing NEPA. TVA is an agency and instrumentality of the United States, established by an act of Congress in 1933, to foster the social and economic welfare of the people of the Tennessee Valley region and to promote the proper use and conservation of the region's natural resources. One component of this mission is the generation, transmission, and sale of reliable and affordable electric energy. As part of its diversified energy strategy, TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear.

The analyses in a programmatic NEPA review are valuable in setting out the broad view of environmental impacts and benefits for a proposed decision such as establishing a policy, program, or plan. That programmatic NEPA review can then be relied upon when agencies make decisions based on the programmatic EIS, as well as decisions based on a subsequent (also known as tiered) NEPA review.

Public comment is invited concerning the scope of the PEIS, alternatives being considered, and environmental issues that should be addressed as a part of this PEIS. TVA is also requesting data, information, and analysis relevant to the proposed action from the public; affected Federal, State, tribal, and local governments, agencies, and offices; the scientific community; industry; or any other interested party.

Background

In June 2019, TVA completed the 2019 Integrated Resource Plan (IRP) and associated EIS. The IRP is a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years. The 2019 IRP recommends solar expansion and anticipated growth in all scenarios analyzed, with most scenarios anticipating 5,000 to 8,000 MW and one anticipating up to 14,000 MW by 2038, as well as up to 5,300 MW of storage. The IRP recommendation as well as customer demand for cleaner energy has prompted TVA to release multiple Requests for Proposal for renewable energy and carbon-free energy resources since 2019. As of April 2023, TVA currently has over 2,900 MW of solar capacity both operating and contracted.

TVA has identified the need to respond in a more efficient and effective manner to the growing number of solar and battery projects that will be required to meet the target supply identified in the 2019 IRP and to meet TVA's carbon reduction goals. Programmatic environmental guidance would seek to minimize potential negative environmental impacts, minimize social and economic impacts, integrate conservation measures with site development in alignment with the TVA Biodiversity Policy, and standardize and streamline the authorization process for solar energy development through a bounding analysis to help identify the range of potential impacts or risks. TVA's purpose is to promote, expedite, and advance the production and transmission of environmentally sound energy resources, including solar energy and battery storage systems, and increase opportunities for responsible renewable energy development.

Alternatives

The PEIS will evaluate a no action alternative, under which TVA would not develop programmatic environmental guidance and continue to address environmental concerns for TVA-owned and TVA-contracted solar and battery projects on a case-by-case basis. Under the action alternative, TVA would develop programmatic environmental guidance through a bounding analysis to help identify the range of potential impacts or risks for use in TVA-owned and TVA-contracted solar and battery projects. TVA solicits comment on whether there are other alternatives that should be assessed in the PEIS. TVA also requests information and analyses that may be relevant to the project.

Resource Areas and Issues To Be Considered

Public scoping is integral to the process for implementing NEPA and ensures that (1) issues are identified early and properly studied, (2) issues of little significance do not consume substantial time and effort, and (3) the analysis of identified issues is thorough and balanced. This PEIS will identify the purpose and need of the action alternative and will contain descriptions of the existing environmental and socioeconomic resources within the TVA power service area that could be affected by the proposed project. Evaluation of potential environmental impacts to these resources will include, but not be limited to, water resources, biological resources, cultural resources, natural areas and recreation, navigation, utilities, recreation, floodplains, wetlands, geology and groundwater, air quality and climate change, greenhouse gas emissions, land use and prime farmland, noise, public health and safety, socioeconomics and environmental justice, solid and hazardous waste and material, transportation, and visual resources. The PEIS will analyze measures that would avoid, minimize, or mitigate environmental effects.

The final range of issues to be addressed in the environmental review will be determined, in part, from scoping comments received. TVA is particularly interested in public input on other reasonable alternatives that should be considered in the PEIS. The preliminary identification of reasonable alternatives and environmental issues in this notice is not meant to be exhaustive or final.

Public Participation

The public is invited to submit comments on the scope of the PEIS no later than the date identified in the **DATES** section of this notice. Federal, state, and local agencies and Native American Tribes are also invited to provide comments. Written requests to participate as a consulting party or cooperating agency must be received by June 20, 2023. Information about this project is available on the TVA web page at *https://www.tva.gov/NEPA* including a link to an online public comment page. Any comments received, including names and addresses, will become part of the administrative record and will be available for public inspection.

After consideration of comments received during the scoping period, TVA will develop a scoping document that will summarize public and agency comments that were received and identify the schedule for completing the PEIS process. Following analysis of the resources and issues, TVA will prepare a draft PEIS for public review and comment tentatively scheduled for 2024; the final PEIS and decision is tentatively scheduled for 2025.

In finalizing the PEIS and in making its final decision, TVA will consider the comments that it receives on the draft PEIS.

Authority: 40 CFR 1501.9.

Susan Jacks,

General Manager, Environmental Resource Compliance.

[FR Doc. 2023–10654 Filed 5–18–23; 8:45 am]

BILLING CODE 8120–08–P

B

Appendix B – Public and Agency Comments

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
1	NOI	Alternatives	Suggestion that other site locations and/or other technologies such as rooftop solar or other power sources be considered.	Carol Coffey; Marcia Guyse	
2	NOI	Component Sourcing	Concern about the sourcing of solar panel components.	Carol Coffey	
3	NOI	Decommissioning; Waste Management	Concern about the toxicity and the lifespan of solar panels.	Carol Coffey	
4	NOI	Cumulative Impacts	The EPA recommends that TVA disclose and consider as part of the cumulative impact analysis whether and how other recently approved projects (including the adjacent North Alabama Utility-Scale Solar Project, the proposed Spring Valley II Solar Project (19 miles from the Project), and First Solar's proposed solar panel manufacturing facility (six miles from the Project), concurrently proposed projects, or reasonably foreseeable future actions may contribute to potentially significant impacts.	Amanetta Somerville, Lead Reviewer, NEPA Section, Strategic Programs Office, USEPA	
5	NOI	Land Use	Concern about TVA's land requirements for solar facilities compared to other developers.	Carol Coffey	
6	NOI	Land Use	Statement that due to the existence of different land types within the allotted 3,761 acres (farmland, woody wetlands, deciduous forest, and hay/pasture), potential impacts of the solar facility construction on each land type should be analyzed and compared. These evaluations should consider factors such as proximity to endangered species, potential for erosion, and comprehensive impacts to existing native vegetation and wildlife.	London Tuma	

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
7	NOI	Soils	Statement that TVA must research and employ best land management practices. The construction of solar facilities on large areas of land necessitates clearing and grading which can result in soil compaction, potential alteration of drainage channels, and increased runoff and erosion. These environmental consequences can be minimized with the implementation of proven techniques including reducing construction-related compaction, maintaining a substantial cover of perennial vegetation requiring minimal upkeep, and incorporating porous spaces between rows of solar panels to facilitate runoff infiltration.	London Tuma	
8	NOI	Prime Farmland; Socioeconomics	Concern for the loss of prime agricultural acres and effects to and the viability of the surrounding community if the Project were built.	Carol Coffey; Marcia Guyse	
9	NOI	Water Resources	Statement in light of recent Clean Water Act violations of another solar facility in Alabama, TVA must ensure proper conduct in accordance with the Clean Water Act to minimize water pollution both during the construction and operation of the solar facility.	London Tuma	
10	NOI	Water Resources (Floodplains)	The EPA recommends that the TVA Model for 100- and 500-year floods to ensure that key infrastructure, such as battery storage facilities, substations, and switchyards, are located outside of these vulnerable areas.	Amanetta Somerville, Lead Reviewer, NEPA Section, Strategic Programs Office, USEPA	
11	NOI	Biological Resources (Wildlife)	Concern for the impact of the solar facility on wildlife in the Project vicinity.	Carol Coffey; Marcia Guyse; Junkang Zhang	

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
12	NOI	Biological Resources (T&E Species)	Concern for the impact of the solar facility on the five threatened and endangered plant species found in Lawrence County.	London Tuma	
13	NOI	Biological Resources; Soils	The EPA recommends that the EIS include a discussion of the following identified exclusions based on current science: U.S. Fish and Wildlife Service critical habitat, lands to which special status species have been translocated, lands adjacent to existing or planned highway wildlife crossing structures, riparian corridors, connecting lands between habitats, bird migration corridors, and areas containing sensitive soils.	Amanetta Somerville, Lead Reviewer, NEPA Section, Strategic Programs Office, USEPA	
14	NOI	Natural Areas, Parks, and Recreation	The EPA recommends that the EIS include a discussion of the following identified exclusions based on current science: National landscape conservation lands, including national historic and scenic trails, national monuments, wilderness areas, wilderness study areas, and wild and scenic rivers; special recreation management areas; and conservation opportunity areas.	Amanetta Somerville, Lead Reviewer, NEPA Section, Strategic Programs Office, USEPA	
15	NOI	Visual Resources	Concern that the solar facility would be visible from nearby residences.	Carol Coffey	
16	NOI	Cultural Resources	Concern that the solar facility would impact historic sites.	Marcia Guyse	

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
17	NOI	Cultural Resources; Cumulative Impacts	NPS requested ongoing coordination in the Project due to the proximity of the Deas-Whiteley Route of the Trail of Tears National Historic Trail, two National Register of Historic Places properties (Bride's Hill and the Joseph Wheeler Plantation District), and the Muscle Shoals National Heritage Area. NPS provided TVA with a link to the geospatial data for the designated alignment of the Trail of Tears for the impact analysis. NPS also recommended that TVA consider the cumulative impacts of nearby solar developments, specifically the adjacent North Alabama Utility-Scale Solar Project, the proposed Spring Valley II Solar Project (19 miles from the Project), and First Solar's proposed solar panel manufacturing facility (six miles from the Project) as these projects also have the potential to affect the Trail of Tears, National Register properties, and the Muscle Shoals National Heritage Areaindicated that the Project would be located in the Muscle Shoals National Heritage Area. NPS stated that they did not anticipate requesting Cooperating Agency status under NEPA, but they may request to be a consulting party under the National Historic Preservation Act.	Ben West, Program Manager, Planning and Compliance Division, NPS	
18	NOI	Cultural Resources	The EPA recommends that the EIS include a discussion of the following identified exclusions based on current science: Traditional cultural properties; areas of tribal importance including burial sites, sacred sites, spiritual sites, and ceremonial sites; and areas on the National Register of Historic Places.	Amanetta Somerville, Lead Reviewer, NEPA Section, Strategic Programs Office, USEPA	

Comment No.	Document	Topic	Public / Agency Comment	Commenter(s)	TVA Response
19	NOI	Environmental Justice	The EPA recommends TVA consider whether the Proposed Action may result in disproportionate impacts, including with consideration of existing pollution, social, economic, or health burdens, on environmental justice communities and if so, identify and address those impacts consistent with Executive Order 12898. The EPA also strongly encourages uses its EJScreen tool when conducting environmental justice scoping efforts.	Amanetta Somerville, Lead Reviewer, NEPA Section, Strategic Programs Office, USEPA	
20	NOI	Environmental Justice	The EPA recommends meaningfully engaging communities with environmental justice concerns and incorporating the proposed Project's input, concerns, and engagement from communities affected. As an appendix, EPA recommends documenting meaningful engagement with stakeholder groups (i.e., residents, schools, retirement communities, care facilities, hospitals, municipalities, landowners, community organizations, etc.). In addition, the EIS should describe how community concerns or recommendations have been used to develop proposed mitigation options or to avoid or minimize impacts on human health and the environment.	Amanetta Somerville, Lead Reviewer, NEPA Section, Strategic Programs Office, USEPA	

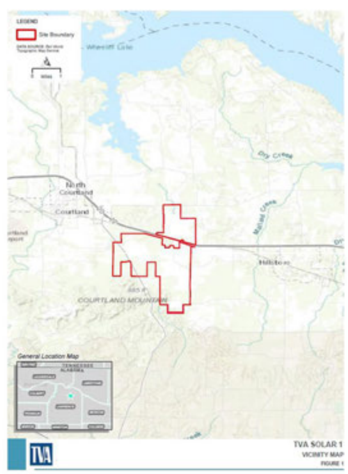
September 3, 2023

Elizabeth Smith
NEPA Specialist, Tennessee Valley Authority,
400 West Summit Hill Drive, WT 11B,
Knoxville, Tennessee 37902

RE: Proposed Hillsboro III Solar Project in Lawrence County Alabama
Docket No. TVA-2023-18757

Dear Ms. Smith,

The purpose of this letter is to comment on docket number 2023-18757, the Notice of Intent to prepare an Environmental Impact Statement (EIS) for the purchase of electricity generated by the proposed Hillsboro III Solar Project. The Hillsboro III Solar Project (88 FR 60529) EIS will consider the potential environmental effects of constructing, operating, and maintaining the proposed 200-megawatt (MW) alternating current (AC) solar facility in Lawrence County, Alabama. This solar construction will allow the Tennessee Valley Authority (TVA) to fulfill the renewable energy goals established in the 2019 Integrated Resource Plan—a comprehensive study of how TVA will meet the demand for electricity in its service territory over the next 20 years (Tolene, 2023).



The outlined area highlights the 3,761 acres of which TVA proposes to choose 1,500 acres to build upon.

As a student studying global sustainability and public policy at the University of Virginia, I would like to communicate that I recognize the importance of renewable energy sources like solar power in addressing the energy needs of our growing communities. The construction of this solar field would both help the TVA meet the increasing consumer demand for clean energy as well as curb current and future carbon emissions, resulting in improved local air quality. However, I am also a steward of Alabama's forested lands and natural resources. My family has strong, longstanding ties to Alabama and its land. In fact, one of Alabama’s four National Forests is named after my ancestor, William B. Bankhead. As such, it is within my interest to ensure that any development, including solar projects, is conducted in a manner that balances environmental conservation and economic development. In order to ensure maximal environmental protection, the TVA must take steps to limit the environmental impacts of the proposed 200 MW AC solar facility.

The first consideration the TVA must make is the impact of the proposed solar facility on nearby endangered species. 16 U.S.C. ch. 35 § 1531 et seq of the Endangered Species Act of 1973 "requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or the NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species" (U.S. EPA, 2023). This section was specifically designed to protect critically endangered species from extinction as a "consequence of economic growth and development untempered by adequate concern and conservation" (Bureau of Land Management et al., n.d.). Currently, Alabama has twenty-three plant species protected under the ESA. Five of these species[1] are found in Lawrence County. Therefore, it is of utmost importance that during your NEPA review, the TVA ensures no presence of these five listed species within the intended 1,500 acres of construction.

Additionally, the TVA must guarantee the fulfillment of federal standards regarding solar farm construction. In Alabama, solar farm development is subject to federal rules related to the Clean Water Act and minimizing water pollution (McPhillips & Yavari, 2023). These are standards repeatedly broken in the past. Last November, the owners of AL Solar A, LLC, a large solar farm in Alabama, were required to pay $500,000 to the EPA to settle Clean Water Act violations. According to the EPA, the LLC failed to design, install and maintain proper stormwater controls, conduct regular site inspections, employ qualified inspectors or accurately report and address stormwater issues. Additionally, the EPA claimed AL Solar A allowed unauthorized discharges of excess sediment into waterways (Leggate, n.d.). The TVA must ensure proper conduct in accordance with the Clean Water Act to minimize water pollution both during the construction and operation of the solar farm.

Finally, the TVA must research and employ best land management practices. The construction of solar facilities on large areas of land necessitates clearing and grading which can result in soil compaction, potential alteration of drainage channels, and increased runoff and erosion (Bureau of Land Management et al., n.d.). These environmental consequences can be minimized with the implementation of proven techniques including reducing construction-related compaction, maintaining a substantial cover of perennial vegetation requiring minimal upkeep, and incorporating porous spaces between rows of solar panels to facilitate runoff infiltration (McPhillips & Yavari, 2023).

These factors must all be addressed in the TVA's subsequent EIS. Additionally, the TVA must consult with all interested agencies in accordance comply the National Environmental Protection Act (NEPA) requirements. The TVA must contact local organizations and government agencies who may be affected by impacts of this project. This includes organizations in charge of

[1]Reference to five endangered species found in Lawrence County, Alabama: Alabama Humanities Alliance. (2023, March 27). *Endangered and Threatened Plants of Alabama*. Encyclopedia of Alabama. Retrieved September 3, 2023, from https://encyclopediaofalabama.org/article/endangered-and-threatened-plants-of-alabama/

surrounding national parks and protected areas such as the Alabama State Port Authority. Other important federal and state governmental agencies to be involved include but are not limited to: the Alabama Department of Conservation and Natural Resources, Office of Wetland and Stream Protections, Alabama Department of Conservation and Natural Resources, Environmental Protection Agency, Department of Wildlife Resources.

I am aware TVA has considered other solar proposals prior to selecting the current Hillsboro III site for further evaluation. This screening process included a review of transmission options which highlighted the Hillsboro site as a notably viable option for connectivity to the TVAs existing transmission system (Tolene, 2023). However, the TVA should continue to evaluate alternatives, including the No Action Alternative. Additional evaluations should compare the unique impacts of constructing the solar facility in different locations within the surplus acreage outlined. Current research has discovered variable impacts of solar panels influenced by site-specific attributes such as soil composition, terrain incline, and the practices employed in site management, including vegetation types and their maintenance (McPhillips & Yavari, 2023). Due to the existence of different land types within the allotted 3,761 acres—farmland, woody wetlands, deciduous forest, and hay/pasture—(Tolene, 2023), potential impacts of the solar facility construction on each land type should be analyzed and compared. These evaluations should consider factors such as proximity to endangered species, potential for erosion, and comprehensive impacts to existing native vegetation and wildlife.

In summary, I am in support of the construction and operation of the TVA's proposed 200-MW solar facility contingent upon the TVA's full consideration of the concerns outlined above. This project has the potential to power over 38,000 homes with clean energy as well as set the standard for future solar farm developments (Davis, 2019). However, in order to minimize the ecological impact of the solar facility, all associated environmental impacts must be thoroughly evaluated and addressed prior to the construction of the Lawrence County solar facility.

I value the opportunity to review the TVA's proposal and share my perspective as an educated and environmentally passionate individual. I look forward to offering further input on this project in the future stages of review. Please reach out if you have any additional questions or concerns.

Sincerely,
London Tuma
University of Virginia '26
B.A. in Global Sustainability | B.A. in Leadership & Public Policy

References

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U.S. EPA. (2023, August 22). *Summary of the Endangered Species Act*. United States Environmental Protection Agency. Retrieved September 3, 2023, from https://www.epa.gov/laws-regulations/summary-endangered-species-act#:~:text=The%20law%20requires%20federal%20agencies,destruction%20or%20adverse%20modification%20of

From: Junkang Zhang
To: nepa
Subject: solar project
Date: Thursday, September 14, 2023 7:17:51 PM

Hello, after reading the summary on federal register about the solar project I was a bit concerned about how this project would effect the wildlife in the area and if it would be located around city's or towns but after reading more int where this will be located it brough ease to my concerned and I hope that this investment has a lot of long term benefits instead of negative outcomes.

From:	Wufoo
To:	nepa
Subject:	Hillsboro III Solar Project [#2]
Date:	Sunday, September 17, 2023 12:12:19 PM

Name	Carol Coffey
City	Hillsboro
State	Alabama
Organization	Personal
Email	[redacted]
Phone Number	[redacted]

Please provide your comments by uploading a file or by entering them below. *

In the last two years I have done an enormous amount of research on so-called Green Energy, including Wind Turbines and especially Solar Panels. Not only are neither Green, and in fact each leaving and exponentially larger carbon footprint than traditional methods of power, especially in our area, nuclear, you are taking extremely large areas of farm land, taking away crops, livelihoods, killing animals (stop denying that), and turning the beauty of the earth into a short term high tech, overly expensive, method of power that for the most part has a lifecycle only about half of what manufacturers purport.
You are literally surrounding our family property with solar panels on four sides, killing animal environments, toxifying the earth, and ruining an area where my family has resided since the 1830s. Even if you "believe" solar farms are the wave of the future (better get them in before Biden goes out) there are locations, like roof tops of the huge/giant manufacturing buildings all over North Alabama, you can put those. You do NOT need to ruin the world for those of us who still appreciate it. See attach pics. One is what our view is now. The other is your plans for it.

Upload File #1	solar_farm.jpg 2.53 MB · JPG
Upload File #2	ggs.jpg 1.22 MB · JPG

(© Carolyn Cole/Los Angeles Times/Getty Images)

From: Wufoo
To: nepa
Subject: Hillsboro III Solar Project [#3]
Date: Sunday, September 17, 2023 1:41:33 PM

Name	Marcia Guyse
City	Courtland
State	Alabama
Email	[redacted]
Phone Number	[redacted]
Please provide your comments by uploading a file or by entering them below. *	Please do not build the solar farm between Hillsboro and Courtland. It will not only take valuable farmland, cover historic sites and be an eye sore in the county, but it will also be dangerous to birds and animals. We have hydro power and solar power. We do not need this plant!

United States Department of the Interior

NATIONAL PARK SERVICE
Atlanta Federal Center
1924 Building
100 Alabama Street, SW
Atlanta, GA 30303

IN REPLY REFER TO:
1.A.2 (SERO-PC)

Electronic Transmittal Only, No Hard Copy to Follow

September 28, 2023

Elizabeth Smith
NEPA Specialist
Tennessee Valley Authority
400 W. Summit Hill Drive, WT 11B
Knoxville, Tennessee 37902

Dear Ms. Smith:

The National Park Service (NPS) has reviewed the Tennessee Valley Authority (TVA) notice of intent (NOI) to prepare an environmental impact statement (EIS) to address the potential environmental effects of purchasing electricity generated by the proposed Hillsboro III Solar Project in Lawrence County, Alabama. The EIS will assess the potential environmental effects of constructing, operating, and maintaining the proposed 200-megawatt alternating current solar facility. TVA has requested comments concerning the scope of the EIS and environmental issues that should be addressed in the EIS as well as data, information, and analysis from potentially affected federal agencies. The NPS has identified several areas of jurisdiction or special expertise that may be affected by the project.

National Scenic and Historic Trails
The Deas-Whiteley Route of the Trail of Tears National Historic Trail (TRTE) runs through Wheeler, AL. Based on our review of the plans provided in the notice, the project would be adjacent to TRTE at Wheeler, and the trail may be affected by the project. Geospatial data for the designated alignment of the TRTE can be located at the following link:

https://irma.nps.gov/DataStore/Reference/Profile/2238914.

Please take TRTE resources, which are not limited to historic properties under the National Historic Preservation Act (NHPA), into account when evaluating the impact of the project. The National Trails Office of the NPS administers the TRTE in accordance with its Congressional designation under the National Trails System Act. The National Trails Office is available to further advise TVA on the designation and significance of the Trail of Tears NHT, the routes of and resources along the trail, potential impacts of the project, and suggest mitigation measures. Additional information requests regarding TRTE should be directed to Jordan Jarrett at 505-470-0426 or jordan_jarrett@nps.gov. The Cherokee Nation Tribal Historic Preservation Officer is also able to provide additional expertise regarding TRTE-related resources and potential impacts as it pertains to Tribal concerns.

National Register of Historic Places
Our initial review also indicates that two properties listed in the National Register of Historic Places - Bride's Hill, a Tidewater Cottage in the Tennessee Valley Thematic Resource and the Joseph Wheeler Plantation District - may be affected by the project. TVA should complete compliance with NHPA Section 106 in its analysis for the project, including identification of historic properties and the area of potential effects. We may find upon further review that it may be appropriate for the NPS to be a consulting party under the NHPA.

National Heritage Areas
The project would be located within the Muscle Shoals National Heritage Area (NHA).

Finally, the NPS notes that the project is adjacent to TVA's approved North Alabama Utility-Scale Solar Project, nineteen miles from TVA's proposed Spring Valley II Solar Project in Colbert County, AL, and within about six miles of First Solar, Inc.'s proposed solar panel manufacturing facility at Trinity, AL, that is the subject of an ongoing evaluation by the U.S. Army Corps of Engineers due to proposed discharge of fill material into waters of the United States. These projects also have the potential to affect TRTE and National Register properties, and they would also occur within the Muscle Shoals NHA. TVA should consider the cumulative effects of nearby solar developments and other reasonably foreseeable actions in its evaluation of the project.

Therefore, please ensure that potential impacts to the TRTE, National Register properties, and the Muscle Shoals NHA are addressed in your evaluation of the project, and that we are included in any applicable future correspondence. The NPS would be happy to provide further information related to our jurisdiction or special expertise to inform any future analysis as needed, including the Congressionally designated alignment of TRTE. Please direct questions regarding this letter to Dusty Pate, Energy Specialist, at 404-772-0637 or haigler_pate@nps.gov.

Sincerely,

BENJAMIN WEST Digi a y sig ed by BENJAM N WEST
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Ben West
Program Manager, Planning and Compliance Division

cc: Carrie Barske Crawford, Muscle Shoals National Heritage Area
Lisa D. Jones, Alabama Historical Commission
Elizabeth Toombs, Cherokee Nation

From:	Wufoo
To:	nepa
Subject:	Hillsboro III Solar Project [#4]
Date:	Thursday, September 28, 2023 12:42:09 PM

Name	Carol Coffey
City	Wheeler
State	AL
Organization	n/a
Email	[redacted]
Phone Number	[redacted]

Please provide your comments by uploading a file or by entering them below. *

I used to support the idea of solar power... then I started researching it. What a scam. Now TVA has intention to surround on four sides, family property that we have had since the 1840s. I talked to Adderholt. According to him TVA has an EPA approved 2 MW solar farm. Looked that up. That would be about 5000 panels and with 2000 panels per acre, that would be 3 acres. Why do you have an option for 4000 acres and other associations for another 3000 acres? Lawrence County is one of the last agricultural counties in North Alabama and you are going to destroy it with expensive, never pay for themselves, toxic to environment and killer of wildlife by taking away their homes and destroying their food supply, not to mention the incredible NON green method of production of panels which most components come from China who uses coal power to create them? It has got to do with money. Why else would TVA sell the people, land and animals of Lawrence County out?

From:	Somerville, Amanetta
To:	Smith, Elizabeth
Subject:	Re: EPA Comments on the Notice of Intent to the Prepare Hillsboro III Solar Project Environmental Impact Statement
Date:	Tuesday, October 3, 2023 1:31:35 PM

Dear Ms. Smith:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced Notice of Intent (NOI), consistent with our responsibilities pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and EPA's authority under Section 309 of the Clean Air Act. The CAA Section 309 role is unique to EPA. It requires EPA to review and comment publicly on any proposed federal action subject to NEPA's environmental impact statement requirement and to make its comments public.

The Tennessee Valley Authority is preparing an Environmental Impact Statement (EIS) on the construction, operation, and maintenance of a proposed 200-megawatt solar facility in Wheeler, Alabama, along US Highway 72 Alternate between Courtland and Hillsboro. The proposed solar development would occupy approximately 1,500 acres of the 3,761-acre Project Study Area.

The EPA is submitting the following recommendations for consideration in preparation of the EIS document: 1) Resource-based exclusions, 2) environmental justice, and 3) cumulative impacts.

1. **Resource-Based Exclusions:**

The EPA recommends that the EIS include a discussion of identified exclusions based on current science. The EPA recommends the following exclusions:

Ecological concerns:

- U.S. Fish and Wildlife Service (USFWS) critical habitat
- Lands to which special status species have been translocated
- Lands adjacent to existing or planned highway wildlife crossing structures
- Riparian corridors
- Connecting lands between habitats
- Bird migration corridors
- Areas containing sensitive soils

Specially designated areas:

- National landscape conservation lands, including national historic and scenic trails, national monuments, wilderness areas, wilderness study areas, and wild and scenic rivers
- Special recreation management areas
- Conservation opportunity areas

Cultural resource and Tribal interests:

- Traditional cultural properties

- Areas of tribal importance including burial sites, sacred sites, spiritual sites, and ceremonial sites
- Areas on the National Register of Historic Places

2. **Environmental Justice (EJ):**

- The EPA recommends TVA consider whether communities may already be experiencing existing pollution, social, economic, or health burdens and whether the proposed action may result in disproportionate impacts on those communities. If so, TVA should identify and address those impacts, as appropriate, consistent with E.O. 12898. Specifically, the EPA recommends that the environmental document identify and address any disproportionate impacts on people of color, indigenous, and low-income populations. The EPA strongly encourages using EJScreen (https://www.epa.gov/ejscreen), the EPA's nationally consistent environmental justice screening and mapping tool, when conducting environmental justice scoping efforts. The tool provides information on environmental and socioeconomic indicators, pollution sources, health disparities, critical service gaps, and climate change data. The tool can help identify potential community vulnerabilities by calculating EJ Indexes and displaying other environmental and socioeconomic information in color-coded maps and standard data reports (e.g., pollution sources, health disparities, critical service gaps, climate change data).

- The EPA recommends meaningfully engaging communities with EJ concerns and incorporating the proposed project's input, concerns, and engagement from communities affected. As an appendix, we recommend documenting meaningful engagement with stakeholder groups (i.e., residents, schools, retirement communities, care facilities, hospitals, municipalities, landowners, community organizations, etc.). In addition, the NEPA document should describe how community concerns or recommendations have been used to develop proposed mitigation options or to avoid or minimize impacts on human health and the environment. For additional information from the Interagency Workgroup on NEPA and EJ, see The Environmental Justice Interagency Working Group *Promising Practices for EJ Methodologies in NEPA Reviews (Promising Practices),* dated March 2016, which provides guiding principles agencies can consider in identifying disproportionately high and adverse impacts on minority and low-income populations. The EJ analysis of the Proposed Action should also be completed in accordance with Executive Order 14096*, Revitalizing Our Nation's Commitment to Environmental Justice for All*, published April 21, 2023.

3. **Cumulative Impacts:**

- The EPA recommends that the TVA Model for 100- and 500-year floods to ensure that key infrastructure, such as battery storage facilities, substations, and switchyards, are located outside of these vulnerable areas.

- Other approved projects may compound some impacts at a regional scale. Beyond project needs and alternatives, the EPA recommends that TVA disclose and consider as part of the cumulative impact analysis whether and how other recently approved projects, concurrently proposed projects, or reasonably foreseeable actions may contribute to potentially significant impacts.

Thank you for the opportunity to comment on the NOI. Should you have any questions or need additional information, please feel free to contact Amanetta Somerville, Lead Reviewer, at 404-562-9025, or somerville.amanetta@epa.gov.

Amanetta Somerville

U.S. Environmental Protection Agency Region 4
61 Forsyth Street SW. Atlanta, Ga 30303
National Environmental Policy Act Section
Strategic Programs Office
Phone: 404-562-9025
E-mail: somerville.amanetta@epa.gov