Atticus Solar, LLC
5 MW Community Solar Facility

Prepared by: Atticus Solar, LLC
Application for Solar Farm Development Permit
Montgomery County, Illinois
PIN(s): 16-36-400-001 & 16-36-300-002
May 2025

Owner Contact Information:

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IRONWOOD RENEWABLES

1.0 Introduction

Atticus Solar, LLC, a wholly owned entity of Ironwood Projects, LLC (together, the "Applicant"), respectfully submits this request for a Solar Farm Development Permit (the "Application") for the development, construction, and long-term operation of a proposed commercial solar energy project (the "Project") in Hillsboro Township, Montgomery County, Illinois.

The Project is planned for a footprint of up to 33.7 acres and is anticipated to generate up to 5 megawatts (MWac) of clean, renewable electricity. The facility will be located on portions of two contiguous parcels, totaling approximately 80.6 acres. A detailed site plan is provided in Exhibit C, which demonstrates compliance with all applicable setback standards outlined in Section F.2.f. of the Montgomery County Solar Ordinance No. 2023-23, Fifth Revision: August 13, 2024, as well as the State of Illinois solar siting statute.

The Applicant remains committed to maintaining transparent, constructive relationships with surrounding landowners and the broader community. While other developers may rely solely on statutory minimums, our approach has always been to exceed those standards where possible. We believe strong community ties are essential for the long-term success of any project in Montgomery County.

The land for this Project—identified by Parcel Identification Numbers 16-36-400-001 and 16-36-300-002—is currently in active agricultural use and will continue to support productive ground cover through the planned integration of pollinator-friendly vegetation. The parcels are owned by Daniel Chappelear, with whom the Applicant has executed a binding purchase option agreement.

The site is bordered by farmland to the north, south, east, and west, and by Illinois State Route 127 to the west. Access to the site will be from Illinois State Route 127, an IDOT-maintained road.

Electricity generated by the facility will be delivered to the grid through one point of interconnection along the Ameren utility corridor adjacent to Illinois State Route 127. Necessary upgrades to the Ameren infrastructure will support this interconnection point, located on the western portion of the property.

This Application reflects the most recent revisions to the Montgomery County Solar Ordinance, amended on August 13, 2024. The Applicant has reviewed all updates to ensure full compliance and has proactively considered potential visual impacts to nearby residences. Outreach to neighboring landowners has already begun and will continue throughout the permitting process. We are confident that the Project's design and siting will minimize visual impacts and avoid disruption to the surrounding community.

IRONWOOD RENEWABLES

As required, the Applicant will provide formal notice to all properties located within 250 feet of the Project boundary, in accordance with Montgomery County's notification requirements and timeline. A full list of neighbors is included as Exhibit O.

In addition, the Project has a fully executed Agricultural Impact Mitigation Agreement (AIMA) with the Illinois Department of Agriculture and has secured an interconnection agreement with Ameren. Pending approval of this Application and issuance of the necessary building permits, construction is projected to begin in May 2026. The Project site was selected for its proximity to the 34.5 kV utility line and the area's low residential density, making it a favorable location for responsible solar development.

We appreciate the opportunity to present this Project to the County and look forward to engaging further with the Board and community stakeholders throughout the review process.

Best,

Keith Morel

Keith Morel
Project Developer
910 Harding St.
Lafayette, LA 70503
337-889-3940
kmorel@ironwoodenergy.com

2.0 Project Description

The project area is currently in active agricultural use and consists of cultivated row crops. If approved, the Project will be developed as a ground-mounted solar energy facility, featuring photovoltaic (PV) modules installed on a racking system, associated inverters, and underground electrical conduit to connect array blocks to the electrical equipment.

Site access will be established via a single driveway off Illinois State Route 127, as shown in the Solar Farm Development Permit Plans (Exhibit C). This access point will support construction activities and ongoing maintenance. A gated entrance will be installed at the access point, and the entire Project Area will be enclosed by a security fence with locked metal gates to restrict unauthorized entry.

Gravel internal access roads will be installed throughout the site to allow for safe and reliable access to the solar infrastructure. These roads will be designed based on the final engineering plans and geotechnical recommendations.

The Project is located on portions of two contiguous parcels in Hillsboro Township, Montgomery County, Illinois. Both parcels are under contract through voluntary agreements with the landowner, Daniel Chappelear, who agreed to participate in the Project.

Permanent Tax Parcel Numbers and Legal Description:

Parcel 1
Parcel ID: No.: 16-36-300-002

THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER (NE1/4SW1/4) OF SECTION THIRTY-SIX (36), TOWNSHIP EIGHT (8) NORTH, RANGE FOUR (4) WEST OF THE THIRD PRINCIPAL MERIDIAN, MONTGOMERY COUNTY, ILLINOIS.

Parcel 2
Parcel ID.: 16-36-400-001

THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER (NW1/4SE1/4) OF SECTION THIRTY-SIX (36), TOWNSHIP (8) NORTH, RANGE FOUR (4) WEST OF THE THIRD PRINCIPAL MERIDIAN, MONTGOMERY COUNTY, ILLINOIS.

IRONWOOD RENEWABLES

2.1 Solar Farm Development Permit Findings of Fact

A. Will the proposed design, location and manner of operation of the proposed Solar Garden or Solar Farm adequately protect the public health, safety and welfare, and the physical environment?

The proposed Solar Farm has been thoughtfully designed and sited to ensure it does not pose any risk to public health, safety, or the surrounding environment. As a low-impact, non-intrusive use, the facility will not emit odors or fumes and will operate quietly, with no sound traveling beyond the project boundaries. This makes it compatible with adjacent agricultural land and supports the long-term preservation of the property for future agricultural use. In addition to delivering renewable energy that benefits public health, the site will be secured with locked fencing to prevent unauthorized access and deter vandalism.

B. Will the proposed Solar Garden or Solar Farm have a negative impact on the value of neighboring property?

The proposed community solar project is not expected to negatively impact neighboring property values. Community solar farms are quiet, low-profile, and visually unobtrusive—making them compatible with rural and agricultural surroundings. A 2024 peer-reviewed study of 70 solar sites across the Midwest found no evidence of property value declines near projects of this size, and in some cases observed slight increases. These findings align with national research from the U.S. Department of Energy's Lawrence Berkeley National Laboratory. A summary of both studies is provided in Exhibit Q.

C. Will the proposed Solar Garden or Solar Farm have a negative impact on public utilities and on traffic circulation?

The Solar Farm is not anticipated to cause any adverse effects on local utilities or traffic patterns. All essential infrastructure—such as utility connections, access routes, and drainage systems—will be thoughtfully planned to avoid disruptions to neighboring properties or the broader community. The Project will also feed clean energy into the local grid, supporting the area's power needs. A new access road will be constructed, and the Applicant will assess stormwater drainage and existing drain tiles to ensure proper management. In compliance with AIMA requirements, any identified drain tiles will be avoided, rerouted, or repaired as needed. Access to and from the site will be designed to ensure safe and efficient traffic flow, with only a minor, temporary increase in vehicle activity during construction and minimal traffic during routine operations.

D. Will the proposed Solar Garden or Solar Farm have an impact on the facilities near the proposed Solar Garden or Solar Farm, such as schools or hospitals or airports that require special protection?

The Solar Farm is not expected to impact nearby facilities, including schools, hospitals, or airports. The Project is not located in close proximity to any such institutions and, as a passive land use, it will not produce emissions, odors, or noise that extend beyond the property line. While the facility itself will operate quietly and unobtrusively, it will contribute clean, renewable energy to the local grid—energy that can ultimately benefit essential community services like schools, medical facilities, and transportation hubs.

2.2 Interconnection Facilities

The Atticus Solar project, a 5.00 MWac distributed energy resource facility, has an interconnection with Ameren Illinois under Queue Position DER-54055. The project will interconnect via a 34.5kV system at County Road 1125 E/State Route 127 in Montgomery County, Illinois. Power from the site will be metered and delivered through Ameren's 34.5kV infrastructure, including newly installed interconnection facilities such as a 3-wire meter, instrument transformers, cabinet, SCADA, and Intellirupter with mapped communication to an existing Intellinode. The feeder and downstream network segments will be confirmed during detailed engineering and final scoping.

All interconnection facilities are to be constructed in accordance with Ameren's published standards and final engineering requirements. See Exhibit B for the draft Interconnection Agreement.

2.3 Project Construction

Construction activities for the Atticus Solar project will be carried out using standard industry best management practices to minimize temporary impacts such as dust and noise. Construction hours will generally be limited to 9:00 a.m. to 5:00 p.m., Monday through Friday, unless alternative hours are approved by the County.

The following table outlines the expected construction schedule and anticipated vehicle traffic throughout the buildout phase:

Construction Period	Activities	Estimated Daily Vehicle Count	Estimated Monthly Heavy Vehicle Trips
Month 1	Mobilization, clearing, initial erosion control measures, and access road prep	13–20 total vehicles/day including personal vehicles, contractor trucks, and material deliveries	24–48
Months 2–5	Fence installation, racking, module	30–44 total vehicles/day	80–120

	placement, and final access road work	including material/equipment deliveries and personnel	
Month 6	System commissioning and site demobilization	9–14 total vehicles/day, including occasional equipment removal	~4

During construction, access to adjacent properties will be maintained at all times. Traffic disruptions on public roads will be avoided to the extent possible. In situations where temporary impacts are unavoidable, the contractor will implement traffic control measures including signage, barriers, lighting, and flaggers, as needed, in accordance with applicable regulations.

Use of the public road right-of-way will be limited to minor grading and gravel placement at project entrance points. All equipment will be operated and maintained per manufacturer specifications and fitted with standard noise-reduction features. Prior to commencing construction, all necessary permits, including any oversize/overweight hauling permits, will be secured from the Illinois Department of Transportation.

2.4 Health and Safety

As part of the Building Permit process, the Project team will coordinate with local fire officials and emergency response personnel to review site plans and establish safety protocols to address any potential incidents, however unlikely. All required signage—including emergency contact details and relevant safety information—will be installed in accordance with local regulations and in coordination with permitting staff.

Following construction, and upon request, the Project will arrange a site walkthrough with local fire departments and emergency responders. Secure access to the facility will be provided to emergency personnel, including gate keys or codes as necessary.

A general assessment of solar energy facility safety and health impacts has been included in Exhibit K. Research indicates that solar farms present minimal fire or explosion risk. The primary project components—solar panels and mounting systems—are non-combustible. The tempered glass used in the panels is engineered to withstand heat and environmental exposure, while the photovoltaic design dissipates heat through energy conversion.

As noted in the *Health and Safety Impacts of Solar Photovoltaics* study by North Carolina State University, the risk of fire from PV systems is low: "...only a small portion of materials in the panels are flammable, and those components cannot self-support a significant fire." These materials include polymer encapsulants, plastic junction boxes, and wire insulation. The majority of each panel's weight consists of protective glass and other non-flammable elements.

Please refer to Exhibit K for the full study.

2.5 Operations and Maintenance

Following construction, the solar farm will operate year-round as a passive generator of clean, renewable electricity. The site's infrastructure and equipment will be designed, permitted, and maintained in accordance with safety and security standards, with regular inspections as needed.

Operational activity is expected to be minimal. Occasional maintenance may be required for equipment such as inverters and transformers, while the solar panels themselves will be continuously monitored through a remote system. On-site traffic will remain low during the operational phase, limited to infrequent visits by a service vehicle several times per year.

To optimize energy production and maintain visual appeal, the Project will implement a vegetation management program within the fenced area and buffer zones. Once construction is complete and stable vegetation is established, routine mowing or trimming will occur based on seasonal weather patterns and moisture levels. This maintenance cycle will continue annually throughout the life of the Project, concluding with the implementation of the Decommissioning Plan, provided in Exhibit D.

3.0 Federal and State Approvals, Permits, and Agreements

3.1 Federal Aviation Administration FAA

The FAA only requires glint and glare evaluations for solar energy systems located at federally obligated, *towered* airports. Because this Project is not located on or near such a facility, a glint and glare assessment is not federally required.

Montgomery County's Solar Ordinance (Section F.2.g) does require a glare analysis if a solar farm is sited within 500 feet of an airport. However, based on the FAA Notice Criteria Tool—results of which are included in Exhibit I—the Project's coordinates and proposed structure heights fall below the thresholds that would trigger a formal notice. As a result, a Solar Glare Hazard Analysis Tool (SGHAT) evaluation is not required for this Project.

3.2 Federal Emergency Management Agency (FEMA)

The Project site was reviewed using the FEMA Flood Insurance Rate Map (FIRM) portal to assess the presence of any 100-year floodplain areas. According to the effective Firmette dated January

9, 1981—provided in Exhibit J—there are no designated FEMA floodplains located within the Project boundary.

3.3 U.S. Fish and Wildlife Service (USFWS)

The Atticus Solar Project has been evaluated for potential impacts to federally listed species and critical habitat through the U.S. Fish and Wildlife Service's IPaC system. The species list generated on April 22, 2025, identified three species potentially present in the vicinity of the project: the Indiana Bat (*Myotis sodalis*), Whooping Crane (*Grus americana*), and Monarch Butterfly (*Danaus plexippus*). No critical habitat is designated within the project area.

The proposed Project area is composed primarily of cultivated croplands and previously developed lands. There is no known roosting or foraging habitat for listed bat species, and the site lacks high-quality habitat typically used by Monarchs or Whooping Cranes for stopovers. Although some wetlands exist within the broader area (See Exhibit L for Wetland Delineation), they are limited in extent and are not expected to support listed species.

The Project design avoids any anticipated surface or groundwater impacts, and no project-related stressors are expected to affect federally listed species. Additionally, the implementation of native pollinator-friendly plantings may provide incidental ecological benefits over time.

Based on this assessment and consistent with USFWS guidance, the Project is anticipated to have no effect on federally listed species or designated critical habitats. Therefore, no further consultation under Section 7 of the Endangered Species Act is required. Supporting documentation and the official IPaC species list are included in Exhibit G.

3.4 Illinois Department of Natural Resources (IDNR) State Ecological Review

The Applicant consulted with the Illinois Department of Natural Resources (IDNR) to evaluate potential impacts to state-listed threatened or endangered species and natural areas through the Ecological Compliance Assessment Tool (EcoCAT). This online platform utilizes the Project's legal description—Township 8N, Range 4W, Section 36 in Montgomery County—to screen for species and resources of concern within or near the project site.

On January 31, 2025, the Applicant submitted a formal EcoCAT request for the Atticus Solar project. In response, IDNR issued a letter (included as Exhibit F) confirming that there are no records of State-listed threatened or endangered species, Illinois Natural Areas Inventory sites, Illinois Nature Preserves, or Land and Water Reserves within the vicinity of the proposed solar project.

Accordingly, and pursuant to 17 Ill. Adm. Code Part 1075, the consultation has been officially terminated. This determination remains valid for two years unless the project is modified, new information emerges, or additional protected resources are identified.

3.5 Illinois Historic Preservation Review (SHPO)

Pursuant to the Illinois State Agency Historic Resources Preservation Act (20 ILCS 3420), the Applicant initiated consultation with the Illinois State Historic Preservation Office (SHPO) to assess potential impacts to cultural, archaeological, and architectural resources related to the proposed Atticus Solar Project. The Project was submitted to SHPO on March 13, 2025, and a formal response was received on April 2, 2025.

SHPO's review determined that no historic architectural properties will be affected within the one-quarter mile visual area of potential effect. However, due to the presence of structures shown on historical plat maps (dated 1874, 1902, and 1912) within the Project area, SHPO has requested that a Phase I archaeological survey be conducted to locate and document any potential archaeological resources.

This requirement is based on the understanding that the Project site has not undergone large-scale ground disturbance beyond typical agricultural activity. If future documentation demonstrates prior disturbance, the Applicant may submit that information to SHPO for further consideration.

A copy of SHPO's response letter (Log #002031325) is included in Exhibit H. The Applicant will coordinate completion of the Phase I archaeological survey prior to the start of construction.

3.6 Illinois Environmental Protection Agency (IEPA) – SWPPP

IEPA's Bureau of Water administers the National Pollutant Discharge Elimination System (NPDES) program, which regulates stormwater discharges from construction activities. Prior to the start of construction, the Project will comply with all applicable requirements, including preparation of a Storm Water Pollution Prevention Plan (SWPPP) and sediment and erosion control measures, as part of the NPDES permit application process.

Before construction begins, the Project will prepare a Stormwater Pollution Prevention Plan (SWPPP) and associated erosion and sediment control plans for submission to the IEPA as part of the NPDES permit process. These plans will ensure compliance with applicable regulations for managing stormwater and preventing sediment runoff. A preliminary SWPPP is included in Exhibit R.

3.7 Illinois Department of Agriculture (IDOA)

The Illinois Renewable Energy Facilities Agricultural Impact Mitigation Act (505 ILCS 147/1 et seq.) requires owners of commercial solar energy facilities to execute an Agricultural Impact Mitigation Agreement (AIMA) with the Illinois Department of Agriculture (IDOA) no later than

45 days before the start of construction. The AIMA is intended to protect the long-term viability of agricultural land affected by construction and decommissioning activities.

In January 2023, the Illinois General Assembly passed an amendment to House Bill 4412, now codified as Public Act 102-1123, which further requires that the AIMA be in place prior to the date of the required public hearing for a solar facility.

The Applicant executed the AIMA for the Project on January 29, 2025, in compliance with these requirements. A copy of the executed agreement is provided in Exhibit E.

4.0 Montgomery County Solar Ordinance and Other Local Approvals

The Project has been designed to meet the requirements set forth in Montgomery County Solar Ordinance No. 2023-23, as amended on August 13, 2024. The proposed facility will consist of a ground-mounted solar array using photovoltaic (PV) modules installed on racking structures, supported by inverters, medium-voltage transformers, and underground electrical conduit linking array blocks to system components.

Site access for construction and long-term maintenance will be provided via a gated entrance located on Illinois State Route 127. All layout and design features are illustrated in the Solar Farm Development Permit Plans provided in Exhibit C.

4.1 Height Requirements

Section C.9 of the Montgomery County Solar Ordinance limits the height of solar arrays to a maximum of thirty (30) feet. The Project, however, will adhere to the stricter requirement outlined in Public Act 102-1123 (55 ILCS 5/5-12020), which mandates that no part of a solar panel, cell, or module may exceed twenty (20) feet in height above ground level when fully tilted.

4.2 Setbacks

In accordance with Section F.2.f of the Montgomery County Solar Ordinance, the Project will observe the following minimum setbacks, measured from the exterior of the proposed perimeter fencing:

i. 50 feet from all property lines of the parcel on which the solar farm is located;
ii. 50 feet from the right-of-way of any public road;
iii. 150 feet from the closest point of any occupied dwelling or community building.

The Project has been designed to meet these setback requirements, as illustrated in the Solar Farm Development Permit Plans included in Exhibit C.

4.3 Glare

To meet the requirements of Section F.2.h of the Montgomery County Solar Ordinance, the Project has been designed and sited to minimize glare and reflections onto neighboring properties and public roadways, and to avoid interference with vehicular or air traffic. The proposed solar panels will feature anti-reflective coating, and the system layout complies with all setback requirements. These design measures ensure the Project will not pose a safety hazard or cause adverse impacts to adjacent properties or traffic flow.

4.4 Soils and Ground Cover

In accordance with Section F.2.a of the Montgomery County Solar Ordinance, a managed vegetative buffer is generally required around the exterior perimeter of the solar farm's fencing. The Project has been designed to minimize visual impacts through strategic site layout and equipment placement, and no formal vegetative screening is proposed. The Solar Farm Development Permit Plans, provided in Exhibit C, demonstrate compliance with applicable ordinance requirements. Additionally, the Project will implement vegetation management practices to control or eliminate noxious weeds, consistent with the Illinois Noxious Weed Law. A Vegetation Maintenance Plan (Exhibit N) has been prepared, outlining mowing schedules, reseeding procedures, and weed control practices.

Additionally, per Section F.2.b of the Ordinance, the Project must demonstrate that the foundation and racking design for the solar panels meets accepted engineering standards based on local soil and climate conditions. A geotechnical report prepared by a licensed engineer certifies that the solar panel foundations and racking system are designed in accordance with accepted engineering standards, taking into account local soil and climate conditions. This report is included in Exhibit M.

4.5 Security Barrier

In compliance with Sections F.2.i and F.2.j of the Montgomery County Solar Ordinance, the Project will be enclosed by a security fence ranging between six (6) and twenty-five (25) feet in height. All access gates will also meet the minimum six-foot height requirement and will be equipped with locks to help prevent unauthorized entry. The Project will fully comply with the Ordinance's security fencing standards.

4.6 Noise

The Project will comply with the applicable noise emission standards established by the Illinois Pollution Control Board (IPCB), as outlined in Title 35 of the Illinois Administrative Code. All major equipment, including inverters and transformers, will be placed strategically to maximize distance from adjacent properties and minimize potential noise impacts. The Project is designed to operate within the allowable sound pressure levels for nearby land uses, ensuring compliance with all state regulations and preventing unreasonable interference with the surrounding community.

4.7 Lighting

If lighting is installed at the site, it will be fully shielded and directed downward to prevent light spill onto adjacent properties. However, given the limited operational activity and the presence of a secure perimeter fence, additional lighting is generally unnecessary and is not currently planned for the Project.

4.8 Decommissioning Plan

A Decommissioning Plan is provided in Exhibit D to ensure the proper removal of solar facility components if the system becomes inoperable for six months or more. The plan has been prepared in accordance with Section G of the Montgomery County Solar Ordinance and the Agricultural Impact Mitigation Agreement (AIMA).

The plan outlines procedures for dismantling and removing Project infrastructure—including solar panels, racking, fencing, and access roads—as well as recycling applicable materials. It also includes provisions for removing landscaping and restoring soil and vegetation to pre-construction conditions. The establishment of native grasses and pollinator-friendly seed mixes during the Project's operational life, combined with the temporary rest from agricultural use, is expected to enhance long-term soil health and support a return to productive farmland.

Prior to the start of commercial operations, the Applicant will provide Montgomery County with a decommissioning bond to guarantee the facility's responsible removal at the end of its operational life.

4.9 Stormwater and NPDES

As part of final engineering, the Project will include a hydrologic analysis comparing pre- and post-construction runoff volumes for both 10-year and 100-year storm events. This analysis is expected to demonstrate a reduction in runoff following development. This anticipated outcome aligns with findings from the U.S. Army Corps of Engineers' *Hydrologic Response of Solar Farms* study (included in Exhibit L), which concludes that transitioning land use from conventional row crops to meadow-like conditions under a solar array typically results in decreased runoff. This assumption has become a widely accepted industry standard.

To comply with federal stormwater regulations, the Project will obtain coverage under the National Pollutant Discharge Elimination System (NPDES) program, established under Section 402 of the Clean Water Act. This program is designed to protect water resources by regulating construction-related stormwater discharges. The NPDES permit will be secured prior to the start of construction activities.

4.10 Standards and Codes

In accordance with Sections E.2–6 and F.2.c of the Montgomery County Solar Ordinance, the Project will comply with all applicable building and safety regulations, including the Illinois Uniform Building Code, State Electrical Code, State Plumbing Code, State Energy Code, State Drainage Laws, and all relevant local, state, and federal codes. The Applicant acknowledges these requirements, and all final engineering documents will be prepared in accordance with these standards.

Per Section F.2.d, on-site power lines and utility connections are generally required to be installed underground unless otherwise appropriate due to site-specific conditions. The Project will install all medium-voltage lines underground within the secured Project area where feasible. In limited circumstances—such as where terrain, environmental features, or utility design constraints exist—overhead lines may be utilized, consistent with standard industry practices and code requirements.

The Project's interconnection to the existing Ameren system will be completed in accordance with the approved Interconnection Agreement. Supporting materials, including the draft Agreement, are included in Exhibit B.

4.11 Avoidance and Mitigation of Damages to Public Infrastructure

The Project Team has identified the public roads expected to be used during construction, operation, and maintenance of the solar facility and has coordinated with the appropriate roadway authorities. Correspondence with the Illinois Department of Transportation is included in Exhibit. Any required Overweight and/or Oversize Permits will be obtained from IDOT prior to the start of construction.

5.0 Conclusion

The Atticus Solar project complies with all applicable requirements of Montgomery County and the State of Illinois and is eligible for a Solar Farm Development Permit to construct a solar energy facility on Illinois State Route 127 in Hillsboro Township, Montgomery County. Atticus Solar LLC, a wholly owned subsidiary of Ironwood Projects, LLC, is seeking a Solar Farm Development Permit, which may be transferred in the event that Atticus Solar LLC is sold by Ironwood Projects.

IRONWOOD
RENEWABLES

Exhibit A: Solar Farm Permit Application

APPLICANT & PROPERTY OWNER INFORMATION (Print or Type):

Applicant/Petitioner information: Atticus Solar, LLC

Company Name: Ironwood Renewables, LLC

Contact Name and Title: Keith Morel, Project Developer

Phone number: 337-889-3940

Mailing address for all official correspondence unless a Legal Representative is designated in which case all correspondence and contact will be made with that Legal Representative:

910 Harding St. Lafayette, LA Zip: 70503

Property Owner Name(s): Daniel Chappelear

Phone number: 217-273-8179

Mailing address: 605 E 1055 North Rd. Pana, IL Zip: 62557

Designated Legal Representative *(licensed to practice law in the State of IL)* of Applicant *(if any)*

Name: ______ Phone: ______

Address: ______ Zip: ______

Designated Contact Person *(if different from Applicant),* to whom all phone calls, requests for information, clarifications, and coordinator for all actions regarding this Petition, who has the authority to act on behalf of the Petitioner in regard to this Petition/Application/Request. *This does not apply if a Legal Representative has been designated in which case all contact will be made through that Legal Representative.*

Name: Keith Morel Phone: 337-889-3940

Address: 910 Harding St. Lafayette, LA Zip: 70503

PROPERTY INFORMATION:

Note: If additional space is needed, please attach additional sheets to the application and reference attachment description in application.

1. Location of the proposed use or structure, and its relationship to existing adjacent uses or structures:
   See narrative included with this application.

2. Legal Description and Acreage:

Parcel 1
Parcel ID: No.: 16-36-300-002

THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER (NE1/4SW1/4) OF SECTION THIRTY-SIX (36), TOWNSHIP EIGHT (8) NORTH, RANGE FOUR (4) WEST OF THE THIRD PRINCIPAL MERIDIAN, MONTGOMERY COUNTY, ILLINOIS.

Parcel 2
Parcel ID.: 16-36-400-001

THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER (NW1/4SE1/4) OF SECTION THIRTY-SIX (36), TOWNSHIP (8) NORTH, RANGE FOUR (4) WEST OF THE THIRD PRINCIPAL MERIDIAN, MONTGOMERY COUNTY, ILLINOIS.

3. Area and dimensions of the site for the proposed structure(s) or uses.
   See site plan on Exhibit C

4. Present Use of property:
   Agricultural fields

5. Present Land Classification: Cultivated agricultural fields

6. Proposed Land Use Activity / Nature of the Proposed Use, including type of activity, manner of operation, number of occupants or employees, and similar matters:
   Proposed use: Solar farm

   See the Narrative included with this application for more details

7. Height, setbacks, and property lines of the proposed uses and/or structure(s).
   See Narrative and Exhibit C

8. Location and number of proposed parking/loading spaces by type of vehicles, to include Weight Classifications and size of access drives/ways.
   The project has no proposed parking, but see Exhibit - for proposed drives

9. Existing and proposed screening, lighting (including intensity) landscaping, erosion control, and drainage) features on the site, including the parking areas.
   See Exhibit C

10. Disclosure of any potential environmental issues and methods for dealing with them.

    See the Narrative for environmental studies/consultations performed.

11. Disclosure of any activities requiring outside agency permits and the names, addresses, and phone numbers of the agency points of contact and how those requirements are being met.
See narrative included with this application.

12. Indicate the suitability of the property in question for Construction:
See the Structural Engineering Geotechnical Report in Exhibit M

13. Adjacent Land Use:

A. North: Agricultural

B. South: Agricultural

C. East: Agricultural

D. West: Agricultural

15. Should this Use be valid only for a specific time period? Yes ____ No X

If Yes, what length of time? ____

16. Does the proposed Permit meet the following standards? Yes X No ____ *(If not, attach a separate sheet explaining why.)*

A. Will the proposed design, location and manner of operation of the proposed Solar Garden or Solar Farm adequately protect the public health, safety and welfare, and the physical environment? See the Narrative included with this application.

B. Will the proposed Solar Garden or Solar Farm have a negative impact on the value of neighboring property?
See the Narrative included with this application.

C. Will the proposed Solar Garden or Solar Farm have a negative impact on public utilities and on traffic circulation?
See the Narrative included with this application.

D. Will the proposed Solar Garden or Solar Farm have an impact on the facilities near the proposed Solar Garden or Solar Farm, such as schools or hospitals or airports that require special protection?

See the Narrative included with this application.

ATTACHMENTS REQUIRED:

1. At the time the application is filed, a non-refundable fee is to be paid by the applicant. The application fee $2,500 per megawatt (MW) of proposed nameplate capacity, up to a maximum fee of $250,000.

2. For entities governed by governing boards, a copy of the Board Resolution or Board Meeting Minutes authorizing the governing board's approval to carry out the requested project and to authorize the submission to Montgomery County by a designated entity officer of the required specific requests / applications / petitions is required to be submitted.

3. An area map and site plan from a certified Illinois licensed Engineer.

4. List of the names, current property tax addresses and property tax PIN numbers of property owners located within two-hundred feet and fifty (250') of the property.

5. A Decommissioning plan including:
   A. Process details and cost estimate of decommission.
   B. Anticipated life expectancy of the Solar Farm.
   C. Method of insuring funds will be available for decommissioning and restoration of the project site to its original, natural condition prior to the solar farm construction.
      1. This includes a proposed schedule of payments to be deposited into an escrow account, on a minimum of a yearly basis, held by Montgomery County as assurance for available decommissioning funds.
   D. The cost estimate of decommissioning will be reviewed every five (5) years, by the County's chosen Independent Engineer, and revised if necessary, at the Developers expense. The review and revised plan shall be sent to the Montgomery County Coordinating Office for Board review. If necessary, provisions will be made to the escrow account balance for the decommissioning of the Solar Garden or Solar Farm.

CERTIFICATION OF A SOLAR GARDEN OR SOLAR FARM PERMIT PETITION / APPLICATION / REQUEST

I/We the undersigned, agree that the information herein and attached is true. I/We, the undersigned, do hereby permit officials and/or consultants of Montgomery County, to enter the property described herein to complete a thorough review of this application.

Address:
6252 Illinois Route 127 Hillsboro, IL 62049

Parcel ID #
16-36-400-001 & 16-36-300-002

Applicant's Printed/Typed Name: Adrian Ortlieb

Signature: Adrian Ortlieb (Apr 28, 2025 09:04 CDT) Date: 04/28/2025

Property Owner's Printed/Typed Name: Daniel Chappelear

Signature: Daniel Chappelear (Apr 25, 2025 16:56 CDT) Date: 04/25/2025

Applicant's Legal or other Representative's Printed/Typed Name (*if applicable)*:

____

Signature: ________________________ Date: ______________

STATEMENT OF CONFORMANCE:

I/We, the undersigned, in making a Petition/ Application / Request to Montgomery County for approval of a Solar Farm or Solar Garden Construction Permit described in this application have reviewed the laws and regulations of Montgomery County to the extent that they are applicable to this proposal and understand that: I/We, the undersigned have no reasonable expectation of approval of this request until such time that a Solar Farm or Solar Garden Construction Permit is actually issued by the Montgomery County and have been so notified of issuance in writing. I/We hereby acknowledge, attest to, and accept the following as conditions of obtaining a Solar Farm or Solar Garden Construction Permit in Montgomery County, Illinois.

- **NO** building, construction, alteration, or use may be started prior to the issuance of a Solar Farm or Solar Garden Construction Permit.
- **All** building construction and all site construction must conform to the plans and specifications approved by the Montgomery County Board. No deviation from or revision to an approved plan may take place without the prior written approval of the Montgomery County Board.
- Any Permit, once issued, is non-transferrable to any other legal entity without the express prior written approval of the Montgomery County Board.
- That **ALL** actions associated with this Permit process shall be taken, processed, and interpreted under the Laws of the State of Illinois and Montgomery County and any legal remedies sought by any party in connection with this Solar Farm or Solar Garden Construction Permit shall be brought forth in the Courts of Montgomery County, Illinois for adjudication.
- That if the applicant is an Agent representing the actual owners of multiple properties, or is a lessor, that the Agent has in their possession signed documentation that the actual property owners are aware of their legal responsibilities to be personally liable for the costs associated with Decommissioning if said lessor or Agent fails for any reason to meet this requirement of the Solar Farm or Solar Garden Construction Permit.

Applicant's Printed/Typed Name: Adrian Ortlieb

Signature: Adrian Ortlieb (Apr 28, 2025 09:04 CDT) Date: 04/28/2025

Applicant's Legal Representative Printed/Typed Name Signature and Date *(If applicable)*:

____

Signature: ________________________ Date: ______________

NOTE: It is the responsibility of the Applicant to notify the Montgomery County Coordinating Office at each stage of work completed once the Permit is issued. **Email: cbadmins@montgomerycountyil.gov**
Phone: 217-532-9577

Address: Montgomery County Coordinator
#1 Courthouse Square – Room 202
Hillsboro, IL 62049

2025.04.25-AtticusCountyApplication

Final Audit Report 2025-04-28

Created:	2025-04-25
By:	Keith Morel (kmorel@ironwoodenergy.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAsOgSniuKqV8GdKCyS2FRsT0fQrDjgHPR

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Exhibit B: Interconnection Agreement

STANDARD AGREEMENT FOR INTERCONNECTION OF DISTRIBUTED ENERGY RESOURCES FACILITIES WITH A CAPACITY LESS THAN OR EQUAL TO 10 MVA

This agreement (together with all attachments, the "Agreement") is made and entered into this 24 day of May 2025, by and between ____________ ("interconnection customer"), as a ______________ organized and existing under the laws of the State of ______________ and Ameren Illinois Company, ("Electric Distribution Company" or "EDC"), a corporation existing under the laws of the State of Illinois. Interconnection customer and EDC each may be referred to as a "Party", or collectively as the "Parties".

Recitals:

Whereas, interconnection customer is proposing to install or direct the installation of a distributed energy resources (DER) facility, or is proposing a generating capacity addition to an existing distributed energy resources (DER) facility, consistent with the interconnection request application form completed by interconnection customer on XX/XX/XXXX; and

Whereas, the interconnection customer will operate and maintain, or cause the operation and maintenance of, the DER facility; and

Whereas, interconnection customer desires to interconnect the DER facility with EDC's electric distribution system.

Now, therefore, in consideration of the premises and mutual covenants set forth in this Agreement, and other good and valuable consideration, the receipt, sufficiency and adequacy of which are hereby acknowledged, the Parties covenant and agree as follows:

Article 1. Scope and Limitations of Agreement

1.1 This Agreement shall be used for all approved interconnection requests for DER facilities that fall under Levels 2, 3 and 4 according to the procedures set forth in Part 466 of the Commission's rules (83 Ill. Adm. Code 466) (referred to as the Illinois Distributed Energy Resources Interconnection Standard).

1.2 This Agreement governs the terms and conditions under which the DER facility will interconnect to, and operate in parallel with, the EDC's electric distribution system.

1.3 This Agreement does not constitute an agreement to purchase or deliver the interconnection customer's power.

1.4 Nothing in this Agreement is intended to affect any other agreement between the EDC and the interconnection customer.

1.5 Terms used in this agreement are defined as in Section 466.20 of the Illinois Distributed Energy Resources Interconnection Standard unless otherwise noted.

1.6 Responsibilities of the Parties

1.6.1 The Parties shall perform all obligations of this Agreement in accordance with all applicable laws and regulations.

1.6.2 The EDC shall construct, own, operate, and maintain its interconnection facilities in accordance with this Agreement.

1.6.3 The interconnection customer shall construct, own, operate, and maintain its distributed energy resources (DER) facility and interconnection facilities in accordance with this Agreement.

1.6.4 Each Party shall operate, maintain, repair, and inspect, and shall be fully responsible for, the facilities that it now or subsequently may own unless otherwise specified in the attachments to this Agreement. Each Party shall be responsible for the safe installation, maintenance, repair and condition of its respective lines and appurtenances on its respective sides of the point of interconnection.

1.6.5 The interconnection customer agrees to design, install, maintain and operate its DER facility so as to minimize the likelihood of causing an adverse system impact on the electric distribution system or any other electric system that is not owned or operated by the EDC.

1.7 Parallel Operation Obligations
Once the DER facility has been authorized to commence parallel operation, the interconnection customer shall abide by all operating procedures established in IEEE Standard 1547 and any other applicable laws, statutes or guidelines, including those specified in Attachment 4 of this Agreement.

1.8 Metering
The interconnection customer shall be responsible for the cost to purchase, install, operate, maintain, test, repair, and replace metering and data acquisition equipment specified in Attachments 5 and 6 of this Agreement.

1.9 Reactive Power

1.9.1 Interconnection customers with a DER facility larger than or equal to 1 MVA shall design their DER facilities to maintain a power factor at the point of interconnection between .95 lagging and .95 leading at all times. Interconnection customers with a DER facility smaller than 1 MVA shall design their DER facility to maintain a power factor at the point of interconnection between .90 lagging and .90 leading at all times.

1.9.2 Any EDC requirements for meeting a specific voltage or specific reactive power schedule as a condition for interconnection shall be clearly specified in Attachment 4. Under no circumstance shall the EDC's additional requirements for voltage or reactive power schedules exceed the normal operating capabilities of the DER facility.

1.9.3 If the interconnection customer does not operate the distributed energy resources (DER) facility within the power factor range specified in Attachment 4, or does not operate the distribute generation facility in accordance with a voltage or reactive power schedule specified in Attachment 4, the interconnection customer is in default, and the terms of Article 6.5 apply.

1.10 Standards of Operations

The interconnection customer must obtain all certifications, permits, licenses and approvals necessary to construct, operate and maintain the facility and to perform its obligations under this Agreement. The interconnection customer is responsible for coordinating and synchronizing the DER facility with the EDC's system. The interconnection customer is responsible for any damage that is caused by the interconnection customer's failure to coordinate or synchronize the DER facility with the electric distribution system. The interconnection customer agrees to be primarily liable for any damages resulting from the continued operation of the DER facility after the EDC ceases to energize the line section to which the DER facility is connected. In Attachment 4, the EDC shall specify the shortest reclose time setting for its protection equipment that could affect the DER facility. The EDC shall notify the interconnection customer at least 10 business days prior to adopting a faster reclose time on any automatic protective equipment, such as a circuit breaker or line recloser, that might affect the DER facility.

Article 2. Inspection, Testing, Authorization, and Right of Access

2.1 Equipment Testing and Inspection

The interconnection customer shall test and inspect its DER facility including the interconnection equipment prior to interconnection in accordance with IEEE Standard 1547 (2003) and IEEE Standard 1547.1 (2005). The interconnection customer shall not operate its DER facility in parallel with the EDC's electric distribution system without prior written authorization by the EDC as provided for in Articles 2.1.1-2.1.3.

2.1.1 The EDC shall perform a witness test after construction of the DER facility is completed, but before parallel operation, unless the EDC specifically waives the witness test. The interconnection customer shall provide the EDC at least 15 business days' notice of the planned commissioning test for the DER facility. If the EDC performs a witness test at a time that is not concurrent with the commissioning test, it shall contact the interconnection customer to schedule the witness test at a mutually agreeable time within 10 business days after the scheduled commissioning test designated on the application. If the EDC does not perform the witness test within 10 business days after the commissioning test, the witness test is deemed waived unless the Parties mutually agree to extend the date for scheduling the witness test, or unless the EDC cannot do so for good cause, in which case, the Parties shall agree to another date for scheduling the test within 10 business days after the original scheduled date. If the witness test is not acceptable to the EDC, the EDC shall deliver in writing a detailed technical description of all deficiencies of the DER facility identified by the EDC during the witness test. The interconnection customer has 30 business days after receipt of the written description to address and resolve any deficiencies. This time period may be extended upon agreement between the EDC and the interconnection customer. If the interconnection customer fails to address and resolve the deficiencies to the satisfaction of the EDC, the applicable cure provisions of Article 6.5 shall apply. The interconnection customer shall, if requested by the EDC, provide a copy of all documentation in its possession regarding testing conducted pursuant to IEEE Standard 1547.1.

2.1.2 If the interconnection customer conducts interim testing of the DER facility prior to the witness test, the interconnection customer shall obtain permission from the EDC before each occurrence of operating the DER facility in parallel with the electric distribution system. The EDC may, at its own expense, send qualified personnel to the DER facility to observe such interim testing, but it cannot mandate that these tests be considered in the final witness test. The EDC is not required to observe the interim testing or precluded from requiring the tests be repeated at the final witness test. During and leading up to the witness test, the EDC shall not limit the interconnection customer's ability to test the DER facility during normal working hours except for safety and reliability reasons.

2.1.3 After the DER facility passes the witness test, the EDC shall affix an authorized signature to the certificate of completion and return it to the interconnection customer approving the interconnection and authorizing parallel operation. The authorization shall not be conditioned or delayed and the EDC shall return the signed certificate of completion to the interconnection customer no more than 10 business days after the date that the DER facility passes the witness test.

2.2 Commercial Operation
The interconnection customer shall not operate the DER facility, except for interim testing as provided in Article 2.1, until such time as the certificate of completion is signed by all Parties.

2.3 Right of Access
The EDC must have access to the disconnect switch and metering equipment of the DER facility at all times. When practical, the EDC shall provide notice to the customer prior to using its right of access.

<u>Article 3.</u> Effective Date, Term, Termination, and Disconnection

3.1 Effective Date
This Agreement shall become effective upon execution by all Parties.

3.2 Term of Agreement
This Agreement shall become effective on the effective date and shall remain in effect unless terminated in accordance with Article 3.3 of this Agreement.

3.3 Termination

3.3.1 The interconnection customer may terminate this Agreement at any time by giving the EDC 30 calendar days prior written notice.

3.3.2 Either Party may terminate this Agreement after default pursuant to Article 6.5.

3.3.3 The EDC may terminate, upon 60 calendar days' prior written notice, for failure of the interconnection customer to complete construction of the DER facility within 12 months after the in-service date as specified by the Parties in Attachment 2, which may be extended by agreement between the Parties.

3.3.4 The EDC may terminate this Agreement, upon 60 calendar days' prior written notice, if the interconnection customer has abandoned, cancelled, permanently disconnected or stopped development, construction, or operation of the DER facility, or if the interconnection customer fails to operate the DER facility in parallel with the EDC's electric system for three consecutive years.

3.3.5 Upon termination of this Agreement, the DER facility will be disconnected from the EDC's electric distribution system. Terminating this Agreement does not relieve either Party of its liabilities and obligations that are owed or continuing when the Agreement is terminated.

3.3.6 If the Agreement is terminated, the interconnection customer loses its position in the interconnection queue.

3.4 Temporary Disconnection

A Party may temporarily disconnect the DER facility from the electric distribution system in the event one or more of the following conditions or events occurs:

3.4.1 Emergency conditions – shall mean any condition or situation: (1) that in the judgment of the Party making the claim is likely to endanger life or property; or (2) that the EDC determines is likely to cause an adverse system impact, or is likely to have a material adverse effect on the EDC's electric distribution system, interconnection facilities or other facilities, or is likely to interrupt or materially interfere with the provision of electric utility service to other customers; or (3) that is likely to cause a material adverse effect on the DER facility or the interconnection equipment. Under emergency conditions, the EDC or the interconnection customer may suspend interconnection service and temporarily disconnect the DER facility from the electric distribution system. The EDC must notify the interconnection customer when it becomes aware of any conditions that might affect the interconnection customer's operation of the DER facility. The interconnection customer shall notify the EDC when it becomes aware of any condition that might affect the EDC's electric distribution system. To the extent information is known, the notification shall describe the condition, the extent of the damage or deficiency, the expected effect on the operation of both Parties' facilities and operations, its anticipated duration, and the necessary corrective action.

3.4.2 Scheduled maintenance, construction, or repair – the EDC may interrupt interconnection service or curtail the output of the DER facility and temporarily disconnect the DER facility from the EDC's electric distribution system when necessary for scheduled maintenance, construction, or repairs on EDC's electric distribution system. The EDC shall provide the interconnection customer with notice no less than 5 business days before an interruption due to scheduled maintenance, construction, or repair, or the EDC shall provide notice immediately if the scheduled maintenance, construction, or repair is scheduled less than 5 business days in advance. The EDC shall coordinate the reduction or temporary disconnection with the interconnection customer; however, the interconnection customer is responsible for out-of-pocket costs incurred by the EDC for deferring or rescheduling maintenance, construction or repair at the interconnection customer's request.

3.4.3 Forced outages – The EDC may suspend interconnection service to repair the EDC's electric distribution system. The EDC shall provide the interconnection customer with prior notice, if possible. If prior notice is not possible, the EDC shall, upon written request, provide the interconnection customer with written documentation, after the fact, explaining the circumstances of the disconnection.

3.4.4 Adverse system impact – the EDC must provide the interconnection customer with written notice of its intention to disconnect the DER facility, if the EDC determines that operation of the DER facility creates an adverse system impact. The documentation that supports the EDC's decision to disconnect must be provided to the interconnection customer. The EDC may disconnect the DER facility if, after receipt of the notice, the interconnection customer fails to remedy the adverse system impact, unless emergency conditions exist, in which case, the provisions of Article 3.4.1 apply. The EDC may continue to leave the generating facility disconnected until the adverse system impact is corrected.

3.4.5 Modification of the DER facility – The interconnection customer must receive written authorization from the EDC prior to making any change to the DER facility, other than a minor equipment modification. If the interconnection customer modifies its facility without the EDC's prior written authorization, the EDC has the right to disconnect the DER facility until such time as the EDC concludes the modification poses no threat to the safety or reliability of its electric distribution system.

3.4.6 The EDC's compliance with Article 3 shall preclude any claim for damages for any lost opportunity or other costs incurred by the interconnection customer as a result of an interruption of service under Article 3. Any dispute over whether the EDC complied with Article 3 shall be resolved in accordance with the dispute resolution mechanism set forth in Article 8.

<u>Article 4.</u> Cost Responsibility for Interconnection Facilities and Distribution Upgrades

4.1 Interconnection Facilities

4.1.1 The interconnection customer shall pay, or reimburse the EDC, as applicable, for the cost of the interconnection facilities itemized in Attachment 3. The EDC shall identify the additional interconnection facilities necessary to interconnect the DER facility with the EDC's electric distribution system, the cost of those facilities, and the time required to build and install those facilities, as well as an estimated date of completion of the building or installation of those facilities.

4.1.2 The interconnection customer is responsible for its expenses, including overheads, associated with owning, operating, maintaining, repairing, and replacing its interconnection equipment.

4.2 Distribution Upgrades
The EDC shall design, procure, construct, install, and own any distribution upgrades. The actual cost of the distribution upgrades, including overheads, shall be directly assigned to the interconnection customer whose distributed energy resources (DER) facility caused the need for the distribution upgrades.

<u>Article 5.</u> Billing, Payment, Milestones, and Financial Security

5.1 Billing and Payment Procedures and Final Accounting (Applies to supplemental reviews conducted under Level 2 or 3 review with EDC construction necessary for accommodating the DER facility, and Level 4 reviews)

5.1.1 The EDC shall bill the interconnection customer for the design, engineering, construction, and procurement costs of EDC-provided interconnection facilities and distribution upgrades contemplated by this Agreement as set forth in Attachment 3. The billing shall occur on a monthly basis, or as otherwise agreed to between the Parties. The interconnection customer shall pay each bill within 30 calendar days after receipt, or as otherwise agreed to between the Parties.

5.1.2 Unless waived by the interconnection customer, within 90 calendar days after completing the construction and installation of the EDC's interconnection facilities and distribution upgrades described in Attachments 2 and 3 to this Agreement, the EDC shall provide the interconnection customer with a final accounting report of any difference between (1) the actual cost incurred to complete the construction and installation of the EDC's interconnection facilities and distribution upgrades; and (2) the interconnection customer's previous deposit and aggregate payments to the EDC for the interconnection facilities and distribution upgrades. If the interconnection customer's cost responsibility exceeds its previous deposit and aggregate payments, the EDC shall invoice the interconnection customer for the amount due and the interconnection customer shall pay the EDC within 30 calendar days. If the interconnection customer's previous deposit and aggregate payments exceed its cost responsibility under this Agreement, the EDC shall refund to the interconnection customer an amount equal to the difference within 30 calendar days after the final accounting report. Upon request from the interconnection customer, if the difference between the budget estimate and the actual cost exceeds 20%, the EDC will provide a written explanation for the difference.

5.1.3 If a Party disputes any portion of its payment obligation pursuant to this Article 5, the Party shall pay in a timely manner all non-disputed portions of its invoice, and the disputed amount shall be resolved pursuant to the dispute resolution provisions contained in Article 8. A Party disputing a portion of an Article 5 payment shall not be considered to be in default of its obligations under this Article.

5.2 Interconnection Customer Deposit

Within 15 business days after signing and returning the interconnection agreement to the EDC, the interconnection customer shall provide the EDC with a deposit equal to 100% of the estimated, non-binding cost to procure, install, or construct any such facilities. However, when the estimated date of completion of the building or installation of facilities exceeds three months from the date of notification, pursuant to Article 4.1.1 of this Agreement, this deposit may be held in escrow by a mutually agreed-upon third-party, with any interest to inure to the benefit of the interconnection customer. To the extent that this interconnection agreement is terminated for any reason, the EDC shall return all deposits provided by the interconnection customer, less any actual costs incurred by the EDC.

Article 6. Assignment, Limitation on Damages, Indemnity, Force Majeure, and Default

6.1 Assignment

This Agreement may be assigned by either Party. If the interconnection customer attempts to assign this Agreement, the assignee must agree to the terms of this Agreement in writing and such writing must be provided to the EDC. Any attempted assignment that violates this Article is void and ineffective. Assignment shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason of the assignment. An assignee is responsible for meeting the same obligations as the assignor.

6.1.1 Either Party may assign this Agreement without the consent of the other Party to any affiliate (including mergers, consolidations or transfers, or a sale of a substantial portion of the Party's assets, between the Party and another entity), of the assigning Party that has an equal or greater credit rating and the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement.

6.1.2 The interconnection customer can assign this Agreement, without the consent of the EDC, for collateral security purposes to aid in providing financing for the DER facility.

6.2 Limitation on Damages

Except for cases of gross negligence or willful misconduct, the liability of any Party to this Agreement shall be limited to direct actual damages and reasonable attorney's fees, and all other damages at law are waived. Under no circumstances, except for cases of gross negligence or willful misconduct, shall any Party or its directors, officers, employees and agents, or any of them, be liable to another Party, whether in tort, contract or other basis in law or equity for any special, indirect, punitive, exemplary or consequential damages, including lost profits, lost revenues, replacement power, cost of capital or replacement equipment. This limitation on damages shall not affect any Party's rights to obtain equitable relief, including specific performance, as otherwise provided in this Agreement. The provisions of this Article 6.2 shall survive the termination or expiration of the Agreement.

6.3 Indemnity

6.3.1 This provision protects each Party from liability incurred to third parties as a result of carrying out the provisions of this Agreement. Liability under this provision is exempt from the general limitations on liability found in Article 6.2.

6.3.2 The interconnection customer shall indemnify and defend the EDC and the EDC's directors, officers, employees, and agents, from all damages and expenses resulting from a third party claim arising out of or based upon the interconnection customer's (a) negligence or willful misconduct or (b) breach of this Agreement.

6.3.3 The EDC shall indemnify and defend the interconnection customer and the interconnection customer's directors, officers, employees, and agents from all damages and expenses resulting from a third party claim arising out of or based upon the EDC's (a) negligence or willful misconduct or (b) breach of this Agreement.

6.3.4 Within 5 business days after receipt by an indemnified Party of any claim or notice that an action or administrative or legal proceeding or investigation as to which the indemnity provided for in this Article may apply has commenced, the indemnified Party shall notify the indemnifying Party of such fact. The failure to notify, or a delay in notification, shall not affect a Party's indemnification obligation unless that failure or delay is materially prejudicial to the indemnifying Party.

6.3.5 If an indemnified Party is entitled to indemnification under this Article as a result of a claim by a third party, and the indemnifying Party fails, after notice and reasonable opportunity to proceed under this Article, to assume the defense of such claim, that indemnified Party may, at the expense of the indemnifying Party, contest, settle or consent to the entry of any judgment with respect to, or pay in full, the claim.

6.3.6 If an indemnifying Party is obligated to indemnify and hold any indemnified Party harmless under this Article, the amount owing to the indemnified person shall be the amount of the indemnified Party's actual loss, net of any insurance or other recovery.

6.4 Force Majeure

6.4.1 As used in this Article, a force majeure event shall mean any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A force majeure event does not include an act of gross negligence or intentional wrongdoing by the Party claiming force majeure.

6.4.2 If a force majeure event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the force majeure event ("Affected Party") shall notify the other Party of the existence of the force majeure event within one business day. The notification must specify the circumstances of the force majeure event, its expected duration, and the steps that the Affected Party is taking and will take to mitigate the effects of the event on its performance. If the initial notification is verbal, it must be followed up with a written notification within one business day. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the force majeure event until the event ends. The Affected Party may suspend or modify its obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the force majeure event cannot be otherwise mitigated.

6.5 Default

6.5.1 No default shall exist when the failure to discharge an obligation (other than the payment of money) results from a force majeure event as defined in this Agreement, or the result of an act or omission of the other Party.

6.5.2 A Party shall be in default ("Default") of this Agreement if it fails in any material respect to comply with, observe or perform, or defaults in the performance of, any covenant or obligation under this Agreement and fails to cure the failure within 60 calendar days after receiving written notice from the other Party. Upon a default of this Agreement, the non-defaulting Party shall give written notice of the default to the defaulting Party. Except as provided in Article 6.5.3, the defaulting Party has 60 calendar days after receipt of the default notice to cure the default; provided, however, if the default cannot be cured within 60 calendar days, the defaulting Party shall commence the cure within 20 calendar days after original notice and complete the cure within six months from receipt of the default notice; and, if cured within that time, the default specified in the notice shall cease to exist.

6.5.3 If a Party has assigned this Agreement in a manner that is not specifically authorized by Article 6.1, fails to provide reasonable access pursuant to Article 2.3, and is in default of its obligations pursuant to Article 7, or if a Party is in default of its payment obligations pursuant to Article 5 of this Agreement, the defaulting Party has 30 days from receipt of the default notice to cure the default.

6.5.4 If a default is not cured as provided for in this Article, or if a default is not capable of being cured within the period provided for in this Article, the non-defaulting Party shall have the right to terminate this Agreement by written notice, and be relieved of any further obligation under this Agreement and, whether or not that Party terminates this Agreement, to recover from the defaulting Party all amounts due under this Agreement, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this Article shall survive termination of this Agreement.

Article 7. Insurance

For DER facilities with a nameplate capacity of 1 MVA or above, the interconnection customer shall carry sufficient insurance coverage so that the maximum comprehensive/general liability coverage that is continuously maintained by the interconnection customer during the term shall be not less than $2,000,000 for each occurrence, and an aggregate, if any, of at least $4,000,000. The EDC, its officers, employees and agents shall be added as an additional insured on this policy. The interconnection customer agrees to provide the EDC with at least 30 calendar days advance written notice of cancellation, reduction in limits, or non-renewal of any insurance policy required by this Article.

Article 8. Dispute Resolution

8.1 Parties shall attempt to resolve all disputes regarding interconnection as provided in this Article in a good faith manner.

8.2 If there is a dispute between the Parties about implementation or an interpretation of the Agreement, the aggrieved Party shall issue a written notice to the other Party to the Agreement that specifies the dispute and the Agreement articles that are disputed.

8.3 A meeting between the Parties shall be held within 10 days after receipt of the written notice. Persons with decision-making authority from each Party shall attend the meeting. If the dispute involves technical issues, persons with sufficient technical expertise and familiarity with the issue in dispute from each Party shall also attend the meeting. The meeting may be conducted by teleconference. The informal process between the parties shall extend 30 days after the receipt of written notice, after which the dispute is deemed resolved and the timeframes for decisions within the interconnection process resume, unless one of the parties seeks resolution through non-binding arbitration procedures described in Article 8.4 or files a formal complaint at the Commission prior to the end of the 30-day period.

8.4 If the parties are unable to resolve the dispute through the process outlined in Article 8.3, either party may submit the interconnection dispute to an Ombudsman for non-binding arbitration. The party electing non-binding arbitration shall notify the other party of the request in writing. The non-binding arbitration process is limited to 60 days, absent mutual agreement of the parties and the Ombudsman to a longer period.

8.5 Each party shall bear its own fees, costs and expenses and an equal share of the expenses of the non-binding arbitration.

8.6 Within 10 days after the conclusion of the procedures in Article 8.4, either party may initiate a formal complaint with the Commission and ask for an expedited resolution of the dispute. If the complaint seeks expedited resolution, any written recommendation of the Ombudsman shall be appended to the complaint. The formal complaint shall proceed as a contested hearing pursuant to the Commission's Rules of Practice.

8.7 A party may, after good faith negotiations have failed, decline to pursue non-binding arbitration and instead initiate a formal complaint with the Commission. The formal complaint shall proceed as a contested hearing pursuant to the Commission's Rules of Practice.

8.8 Pursuit of dispute resolution may not affect an interconnection request or an interconnection applicant's position in the EDC's interconnection queue.

8.9 If the Parties fail to resolve their dispute under the dispute resolution provisions of this Article, nothing in this Article shall affect any Party's rights to obtain equitable relief, including specific performance, as otherwise provided in this Agreement.

Article 9. Miscellaneous

9.1 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the State of Illinois, without regard to its conflicts of law principles. This Agreement is subject to all applicable laws and regulations. Each Party expressly reserves the right to seek change in, appeal, or otherwise contest any laws, orders or regulations of a governmental authority. The language in all parts of this Agreement shall in all cases be construed as a whole, according to its fair meaning, and not strictly for or against the EDC or interconnection customer, regardless of the involvement of either Party in drafting this Agreement.

9.2 Amendment

Modification of this Agreement shall be only by a written instrument duly executed by both Parties.

9.3 No Third-Party Beneficiaries

This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations in this Agreement assumed are solely for the use and benefit of the Parties, their successors in interest and, where permitted, their assigns.

9.4 Waiver

9.4.1 Except as otherwise provided in this Agreement, a Party's compliance with any obligation, covenant, agreement, or condition in this Agreement may be waived by the Party entitled to the benefits thereof only by a written instrument signed by the Party granting the waiver, but the waiver or failure to insist upon strict compliance with the obligation, covenant, agreement, or condition shall not operate as a waiver of, or estoppel with respect to, any subsequent or other failure.

9.4.2. Failure of any Party to enforce or insist upon compliance with any of the terms or conditions of this Agreement, or to give notice or declare this Agreement or the rights under this Agreement terminated, shall not constitute a waiver or relinquishment of any rights set out in this Agreement, but the same shall be and remain at all times in full force and effect, unless and only to the extent expressly set forth in a written document signed by that Party granting the waiver or relinquishing any such rights. Any waiver granted, or relinquishment of any right, by a Party shall not operate as a relinquishment of any other rights or a waiver of any other failure of the Party granted the waiver to comply with any obligation, covenant, agreement, or condition of this Agreement.

9.5 Entire Agreement

Except as provided in Article 9.1, this Agreement, including all attachments, constitutes the entire Agreement between the Parties with reference to the subject matter of this Agreement, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of this Agreement. There are no other agreements, representations, warranties, or covenants that constitute any part of the consideration for, or any condition to, either Party's compliance with its obligations under this Agreement.

9.6 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original, but all constitute one and the same instrument.

9.7 No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties, or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

9.8 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other governmental authority, (1) that portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by the ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

9.9 Environmental Releases

Each Party shall notify the other Party of the release of any hazardous substances, any asbestos or lead abatement activities, or any type of remediation activities related to the DER facility or the interconnection facilities, each of which may reasonably be expected to affect the other Party. The notifying Party shall (1) provide the notice as soon as practicable, provided that Party makes a good faith effort to provide the notice no later than 24 hours after that Party becomes aware of the occurrence, and (2) promptly furnish to the other Party copies of any publicly available reports filed with any governmental authorities addressing such events.

9.10 Subcontractors

Nothing in this Agreement shall prevent a Party from using the services of any subcontractor it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing services and each Party shall remain primarily liable to the other Party for the performance of the subcontractor.

9.10.1 A subcontract relationship does not relieve any Party of any of its obligations under this Agreement. The hiring Party remains responsible to the other Party for the acts or omissions of its subcontractor. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of the hiring Party.

9.10.2 The obligations under this Article cannot be limited in any way by any limitation of subcontractor's insurance.

Article 10. Notices

10.1 General

Unless otherwise provided in this Agreement, any written notice, demand, or request required or authorized in connection with this Agreement ("Notice") shall be deemed properly given if delivered in person, delivered by recognized national courier service, or sent by first class mail, postage prepaid, to the person specified below:

If to Interconnection Customer:

Interconnection Customer: ______________________________

Attention: ______________________________

Address: ______________________________

City: ______________ State: ________ Zip: ________

Phone: ____________ Fax: ____________ E-Mail: ____________

If to EDC:

EDC: Ameren Illinois Company

Attention: Ameren Illinois Net Metering Coordinator

Address: 10 Richard Mark Way – Mail Code 910

City: Collinsville State: IL Zip: 62234

Phone: ____________ Fax: ____________ E-Mail: RenewablesIllinois@ameren.com

Alternative Forms of Notice

Any notice or request required or permitted to be given by either Party to the other Party and not required by this Agreement to be in writing may be given by telephone, facsimile or e-mail to the telephone numbers and e-mail addresses set out above.

10.2 Billing and Payment

Billings and payments shall be sent to the addresses set out below:

If to Interconnection Customer:

Interconnection Customer: ______________________________

Attention: ______________________________

Address: ______________________________

City: ______________ State: ________ Zip: ________

If to EDC:

EDC: Ameren Illinois

Attention: Ameren Net Metering Coordinator

Address: 10 Richard Mark Way – Mail Code 910

City: Collinsville State: IL Zip: 62234

10.3 Designated Operating Representative

The Parties may also designate operating representatives to conduct the communications that may be necessary or convenient for the administration of this Agreement. This person will also serve as the point of contact with respect to operations and maintenance of the Party's facilities.

Interconnection Customer's Operating Representative: ______________________

Attention: ______________________

Address: ______________________

City: ______________________ State: __________ Zip: __________

EDC's Operating Representative: Ameren Illinois

Attention: Ameren Illinois Net Metering Coordinator

Address: 10 Richard Mark Way – Mail Code 910

City: Collinsville State: IL Zip: 62234

10.4 Changes to the Notice Information

Either Party may change this notice information by giving five business days written notice before the effective date of the change.

Article 11. Signatures

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their respective duly authorized representatives.

For the Interconnection Customer: -

Name: ______________________________

Title: ______________________________

Date: ______________________________

For EDC:

Name: ______________________________

Title: ______________________________

Date: ______________________________

Attachment 1

Definitions

Adverse system impact – A negative effect that compromises the safety or reliability of the electric distribution system or materially affects the quality of electric service provided by the electric distribution company (EDC) to other customers.

Applicable laws and regulations – All duly promulgated applicable federal, State and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any governmental authority, having jurisdiction over the Parties.

Commissioning test – Tests applied to a distributed energy resources (DER) facility by the applicant after construction is completed to verify that the facility does not create adverse system impacts. At a minimum, the scope of the commissioning tests performed shall include the commissioning test specified IEEE Standard 1547 Section 5.4 "Commissioning tests."

Distributed Energy Resources (DER) facility – The equipment used by an interconnection customer to generate or store electricity that operates in parallel with the electric distribution system. A distributed generation facility typically includes an electric generator, prime mover, and the interconnection equipment required to safely interconnect with the electric distribution system or a local electric power system.

Distribution upgrades – A required addition or modification to the EDC's electric distribution system at or beyond the point of interconnection to accommodate the interconnection of a distributed energy resources (DER) facility. Distribution upgrades do not include interconnection facilities.

Electric distribution company or EDC – Any electric utility entity subject to the jurisdiction of the Illinois Commerce Commission.

Electric distribution system – The facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries from interchanges with higher voltage transmission networks that transport bulk power over longer distances. The voltage levels at which electric distribution systems operate differ among areas but generally carry less than 100 kilovolts of electricity. Electric distribution system has the same meaning as the term Area EPS, as defined in 3.1.6.1 of IEEE Standard 1547.

Facilities study – An engineering study conducted by the EDC to determine the required modifications to the EDC's electric distribution system, including the cost and the time required to build and install the modifications, as necessary to accommodate an interconnection request.

Force majeure event – Any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A force majeure event does not include an act of gross negligence or intentional wrongdoing.

Governmental authority – Any federal, State, local or other governmental regulatory or administrative agency, court, commission, department, board, other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that this term does not include the interconnection customer, EDC or any affiliate of either.

IEEE Standard 1547 – The Institute of Electrical and Electronics Engineers, Inc. (IEEE), 3 Park Avenue, New York NY 10016-5997, Standard 1547 (2003), "Standard for Interconnecting Distributed Resources with Electric Power Systems."

IEEE Standard 1547.1 – The IEEE Standard 1547.1 (2005), "Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems."

Interconnection agreement or Agreement – The agreement between the interconnection customer and the EDC. The interconnection agreement governs the connection of the distributed energy resources (DER) facility to the EDC's electric distribution system and the ongoing operation of the distributed generation facility after it is connected to the EDC's electric distribution system.

Interconnection customer – The entity entering into this Agreement for the purpose of interconnecting a distributed energy resources (DER) facility to the EDC's electric distribution system.

Interconnection equipment – A group of components or an integrated system connecting an electric generator with a local electric power system or an electric distribution system that includes all interface equipment, including switchgear, protective devices, inverters or other interface devices. Interconnection equipment may be installed as part of an integrated equipment package that includes a generator or other electric source.

Interconnection facilities – Facilities and equipment required by the EDC to accommodate the interconnection of a distributed energy resources (DER) facility. Collectively, interconnection facilities include all facilities, and equipment between the distributed energy resources (DER) facility and the point of interconnection, including modification, additions, or upgrades that are necessary to physically and electrically interconnect the distributed energy resources (DER) facility to the electric distribution system. Interconnection facilities are sole use facilities and do not include distribution upgrades.

Interconnection request – An interconnection customer's request, on the required form, for the interconnection of a new distributed energy resources (DER) facility, or to increase the capacity or change the operating characteristics of an existing distributed energy resources (DER) facility that is interconnected with the EDC's electric distribution system.

Interconnection study – Any of the following studies, as determined to be appropriate by the EDC: the interconnection feasibility study, the interconnection system impact study, and the interconnection facilities study.

Illinois standard distributed energy resources interconnection rules – The most current version of the procedures for interconnecting distributed energy resources (DER) facilities adopted by the Illinois Commerce Commission. See 83 Ill. Adm. Code 466.

Parallel operation or Parallel – The state of operation that occurs when a distributed energy resources (DER) facility is connected electrically to the electric distribution system.

Point of interconnection – The point where the distributed energy resources (DER) facility is electrically connected to the electric distribution system. Point of interconnection has the same meaning as the term "point of common coupling" defined in 3.1.13 of IEEE Standard 1547.

Witness test – For lab-certified equipment, verification (either by an on-site observation or review of documents) by the EDC that the interconnection installation evaluation required by IEEE Standard 1547 Section 5.3 and the commissioning test required by IEEE Standard 1547 Section 5.4 have been adequately performed. For interconnection equipment that has not been lab-certified, the witness test shall also include verification by the EDC of the on-site design tests required by IEEE Standard 1547 Section 5.1 and verification by the EDC of production tests required by IEEE Standard 1547 Section 5.2. All tests verified by the EDC are to be performed in accordance with the test procedures specified by IEEE Standard 1547.1.

Attachment 2

Construction Schedule, Proposed Equipment & Settings

This attachment is to be completed by the interconnection customer and shall include the following:

1. The construction schedule for the distributed energy resources (DER) facility.

2. A one-line diagram indicating the distributed energy resources (DER) facility, interconnection equipment, interconnection facilities, metering equipment, and distribution upgrades.

3. Component specifications for equipment identified in the one-line diagram.

4. Component settings.

5. Proposed sequence of operations.

6. A three line diagram showing current potential circuits for protective relays.

7. Relay tripping and control schematic diagram.

Attachment 3

Description, Costs and Time Required to Build and Install the EDC's Interconnection Facilities

This attachment is to be completed by the EDC and shall include the following:

1. Required interconnection facilities, including any required metering.

   Per the prior studies - EDC shall build the substation facilities as required to support the interconnection of the interconnection customer proposed facility up to the point of disconnect. The interconnection would consist of installing 3-wire 34.5kV meter, pole, instrument transformers, cabinet, wires, Intellriupter, 2 main line disconnect switches, line tap pole, .1 mile extension at POI, SCADA, and map new Intellirupter to existing Intellinode. The interconnection customer would be responsible for construction to the point of disconnect. All costs shall be paid for and/or reimbursed by the interconnection customer pursuant to Article 5 of this agreement. The interconnection customer is required to construct all facilities which connect to EDC's facilities or otherwise interface with EDC's facilities, all as determined by EDC's final, detailed engineering, in accordance with EDC's published standards.

   Additional required interconnection facilities and system upgrades may be identified while completing Detailed Engineering.

2. An estimate of itemized costs charged by the EDC for interconnection, including overheads, based on results from prior studies.

   Atticus Solar LLC: County Road 1125 E, Montgomery, IL- **5000KW**

   (PowerClerk DER-54055)

   Queue Position: 2

   NOTE: *THE COST ESTIMATE PROVIDED FOR YOUR PROJECT IN THE NEXT SECTION IS CONTINGENT UPON CONSTRUCTION COMPLETION OF ALL SYSTEM UPGRADES REQUIRED OF PROJECT(S) AHEAD OF YOUR PROJECT IN THE QUEUE THAT HAVE AN IMPACT ON THE CONNECTION OF YOUR PROJECT. SHOULD ANY ONE OR MORE OF SUCH PROJECTS WITHDRAW FOR ANY REASON, THE COSTS ASSOCIATED WITH YOUR PROJECT MAY CHANGE TO REFLECT THE COST IMPACT OF SYSTEM UPGRADES THAT NOW MAY BE REQUIRED TO CONNECT YOUR PROJECT AS A RESULT OF THE WITHDRAWAL OF SUCH HIGHER QUEUED PROJECTS.*

An estimate of itemized costs charged by the EDC for interconnection, including overheads.

☐ for installing 3-wire 34.5kV meter, pole, instrument transformers, cabinet, wires, Intellriupter, 2 main line disconnect switches, line tap pole, .1 mile extension at POI, SCADA, and map new Intellirupter to existing Intellinode.. This will be subject to a true-up process at the end of the project.

Ameren Illinois reserves the right to revise this estimate prior to and during construction based on the requirements of Good Utility practices not foreseen at the time of the original estimate. The revisions to the estimate may include, but are not limited to, changes in the cost of materials and required labor.

Notwithstanding Section 5.2 of this Agreement, the Parties may agree to other forms of security in lieu of a cash deposit provided such other form of security is acceptable to the EDC.

3. An estimate for the time required to build and install the EDC's interconnection facilities based on results from prior studies and an estimate of the date upon which the facilities will be completed.

   The final construction timeline will be developed during the scoping meeting which will be held with the applicant after the deposit is paid in full and will continue to be updated as the developer and Ameren Illinois work thru the construction process. That notwithstanding, it is anticipated that Ameren Illinois will initiate procurement activities immediately following the scoping meeting. Any revisions to the current scope of construction activities and their timeline will be provided immediately after that discussion. The requested in-service date is dependent on the availability of any long lead time equipment and weather impacts on construction activities.

Attachment 4

Operating Requirements for Distributed Energy Resources Facilities Operating in Parallel

The EDC shall list specific operating practices that apply to this distributed energy resources (DER) interconnection and the conditions under which each listed specific operating practice applies.

1. Customer shall meet requirements specified in Level 2 or 4 study.

Attachment 5

Monitoring and Control Requirements

This attachment is to be completed by the EDC and shall include the following:

1. The EDC's monitoring and control requirements must be specified, along with a reference to the EDC's written requirements documents from which these requirements are derived.

2. An internet link to the requirements documents.

https://www.ameren.com/service-manual

http://standards.ieee.org

Attachment 6

Metering Requirements

This attachment is to be completed by the EDC and shall include the following:

1. The metering requirements for the distributed generation facility.

   The specific metering requirements and equipment will be specified as part of the Detailed Engineering.

2. Identification of the appropriate tariffs that establish these requirements.

3. An internet link to these tariffs.

https://www.ameren.com/illinois/business/rates/

https://www.ameren.com/illinois/electric-choice/renewables

Attachment 7

As Built Documents

This attachment is to be completed by the interconnection customer and shall include the following:

When it returns the certificate of completion to the EDC, the interconnection customer shall provide the EDC with documents detailing the as-built status of the following:

1. A one-line diagram indicating the distributed generation facility, interconnection equipment, interconnection facilities, and metering equipment.

2. Component specifications for equipment identified in the one-line diagram.

3. Component settings.

4. Proposed sequence of operations.

5. A three-line diagram showing current potential circuits for protective relays.

6. Relay tripping and control schematic diagram.

Exhibit C: Solar Farm Development Permit Plans

IRONWOOD RENEWABLES

APPLICANT: IRONWOOD RENEWABLES, LLC
PROJECT NAME: ATTICUS SOLAR, LLC
A 5 MW (AC) GROUND-MOUNTED SOLAR POWER GENERATING FACILITY

STATE ROUTE 127, HILLSBORO, MONTGOMERY COUNTY, ILLINOIS
SOLAR FARM DEVELOPMENT PERMIT PLANS

DEVELOPMENT TEAM

APPLICANT
IRONWOOD RENEWABLES, LLC
910 HARDING STREET
LAFAYETTE, LA 70503
CONTACT: HAMILTON CARRIER

CONSULTANT
IRONWOOD RENEWABLES, LLC
910 HARDING STREET
LAFAYETTE, LA 70503
EMAIL: HCARRIER@IRONWOODENERGY.COM
CONTACT: HAMILTON CARRIER

CIVIL ENGINEER/LANDSCAPE ARCHITECT/SURVEYOR
ATWELL, LLC
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563
TELEPHONE: (630) 577-0800
EMAIL: MKEITH@ATWELL-GROUP.COM
CONTACT: MICHAEL KEITH, P.E.

GOVERNING AGENCIES CONTACTS

PLANNING - BUILDING - ZONING
MONTGOMERY COUNTY BOARD
#1 COURTHOUSE SQUARE, ROOM 202
HILLSBORO, IL 62049
PHONE: (217) 532-9577
EMAIL: CBADMINS@MONTGOMERYCOUNTYIL.GOV
CONTACT: MIKE PLUNKETT, COUNTY COORDINATOR

HIGHWAY DEPARTMENT
MONTGOMERY COUNTY HIGHWAY DEPARTMENT
11159 IL ROUTE 185
HILLSBORO, IL 62049
TELEPHONE: (217) 532-6109
EMAIL: ENGINEER@MONTGOMERYCOUNTYIL.GOV
CONTACT: CODY A. GREENWOOD, P.E.

SOIL & WATER CONSERVATION DISTRICT
MONTGOMERY COUNTY SOIL & WATER CONSERVATION DISTRICT
1621 VANDALIA ROAD
HILLSBORO, IL 6249
EMAIL: INFO@MONTSWCD.COM
TELEPHONE: (217) 532-3361 EXT 3

LEGAL DESCRIPTION

LEGAL DESCRIPTION PER STEWART TITLE GUARANTY COMPANY COMMITMENT NO. 25000370150-01, COMMITMENT DATE: FEBRUARY 4, 2025:

PARCEL 1
PARCEL ID NO.: 16-36-300-002

THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER (NE1/4SW1/4) OF SECTION THIRTY-SIX (36), TOWNSHIP EIGHT (8) NORTH, RANGE FOUR (4) WEST OF THE THIRD PRINCIPAL MERIDIAN, MONTGOMERY COUNTY, ILLINOIS.

PARCEL 2
PARCEL ID NO.: 16-36-400-001

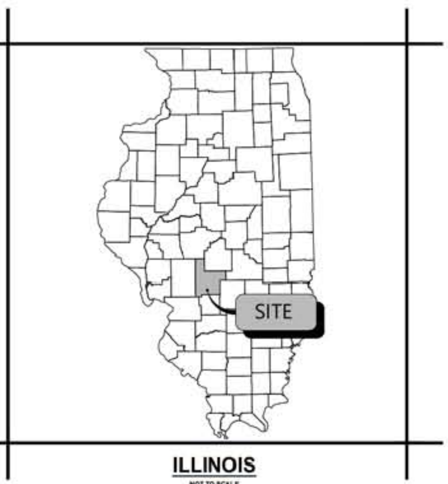
THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER (NW1/4SE1/4) OF SECTION THIRTY-SIX (36), TOWNSHIP EIGHT (8) NORTH, RANGE FOUR (4) WEST OF THE THIRD PRINCIPAL MERIDIAN, MONTGOMERY COUNTY, ILLINOIS.

SHEET INDEX	
SHEET	SHEET TITLE
C-000	COVER SHEET
C-100	EXISTING CONDITIONS PLAN
C-200	SITE LAYOUT PLAN
C-300	GRADING PLAN
C-400	LANDSCAPE PLAN
C-500	DETAILS

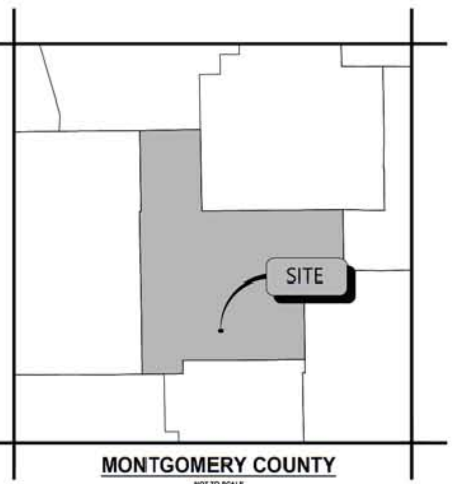
Michael B. Keith
MICHAEL B. KEITH, P.E.
LICENSE NO. 062-066723
EXP. 11/30/2025

MICHAEL BRIAN KEITH
062-066723
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

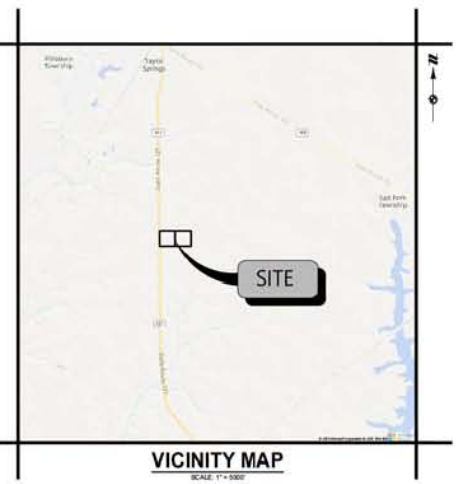
05/12/2025
DATE



ILLINOIS
NOT TO SCALE



MONTGOMERY COUNTY
NOT TO SCALE



VICINITY MAP
SCALE: 1" = 5000'

811
Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

ATWELL
866.850.4200 www.atwell.com
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563

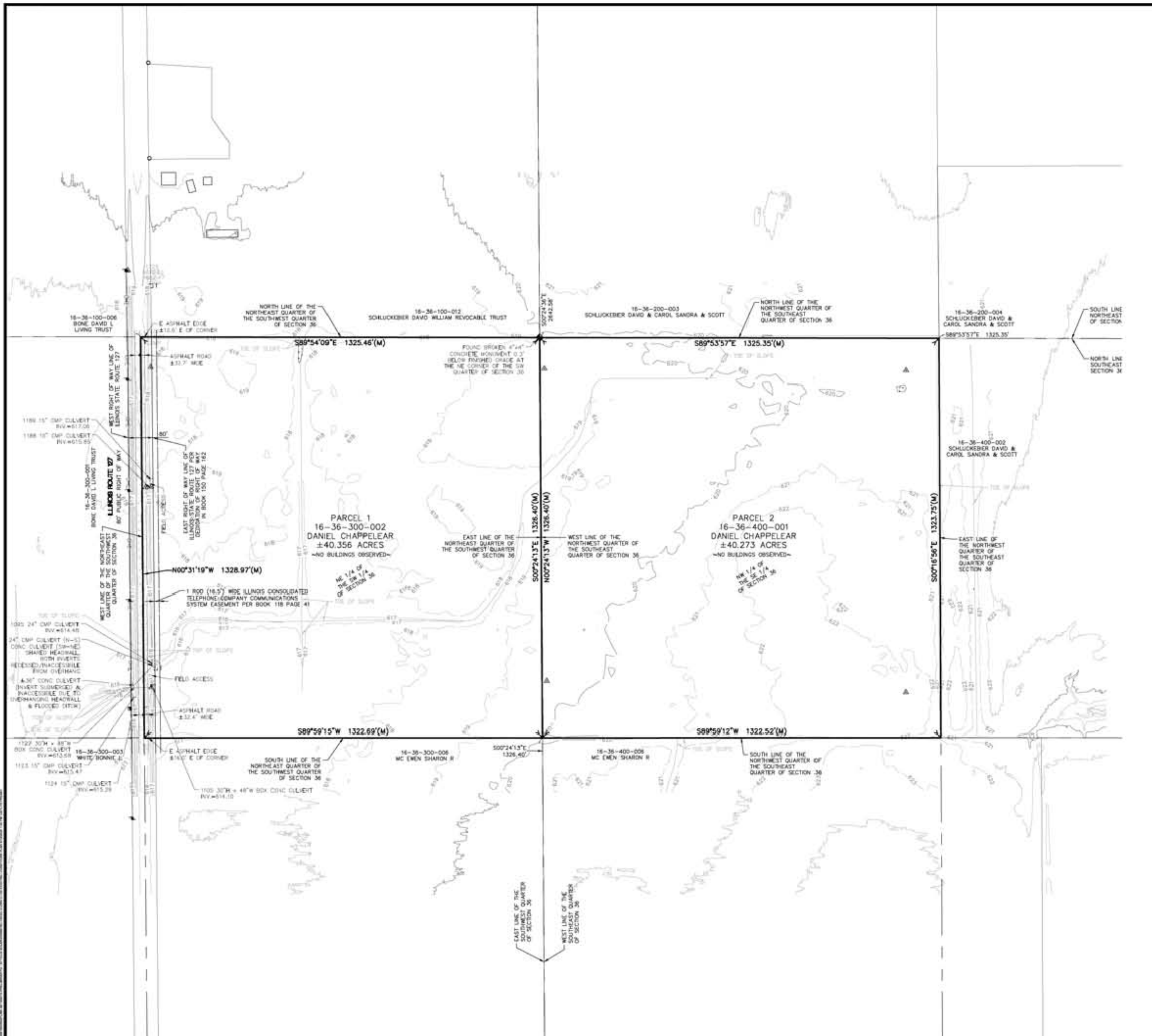
SECTION 36
TOWN 8 NORTH, RANGE 4 WEST
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

ATTRIBUTE: IRONWOOD RENEWABLES, LLC
ATTICUS SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
COVER SHEET

NOT FOR CONSTRUCTION

DATE MAY 12, 2025
REVISIONS

SCALE
N.T.S.
DR. C.M.P. CH. M.S.
P.M. M. KEITH
JOB 24009016
SHEET NO.
C-000



LEGEND

	BOUNDARY LINE
	EXISTING ROW
	BOUNDARY ADJACENT LINE
	SECTION LINE
	EXISTING EASEMENT LINE
	EXISTING CONTOUR
	EXISTING CURB AND GUTTER
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	EXISTING UNDERGROUND GAS
	EXISTING UNDERGROUND TELEPHONE
	EXISTING OVERHEAD TELEPHONE
	EXISTING UNDERGROUND ELECTRIC
	EXISTING OVERHEAD ELECTRIC
	EXISTING UNDERGROUND CABLE
	EXISTING OVERHEAD CABLE
	EXISTING CENTERLINE OF DITCH
	EXISTING FENCE
	EXISTING GUARD RAIL
	EXISTING RAILROAD
	EXISTING VEGETATION LINE
	EXISTING WETLAND
	EXISTING WETLAND BUFFER
	EXISTING DRAIN TILE
	SECTION CORNER
	MONITORING WELL
	SOIL BORING, REFER TO GEOTECHNICAL REPORT
⊙F	FOUND IRON ROD
⊙S	SET IRON ROD
×F	FOUND PK NAIL
⊙F	FOUND MONUMENT
	EXISTING SIGN
	EXISTING BOLLARD
	EXISTING TREE
C.O.	EXISTING CLEANOUT
	EXISTING SANITARY MANHOLE
	EXISTING FLARED END SECTION
	EXISTING STORM CATCH BASIN/MANHOLE
	EXISTING WATER VALVE
	EXISTING FIRE HYDRANT
	EXISTING WATER METER
	EXISTING WATER MARKER
	EXISTING GAS METER
	EXISTING GAS VALVE
	EXISTING GAS RISER
	EXISTING GAS MARKER
T	EXISTING TELEPHONE RISER
	EXISTING TELEPHONE MANHOLE
	EXISTING TELEPHONE MARKER
	EXISTING TRAFFIC SIGNAL
	EXISTING ELECTRIC TRANSFORMER
E	EXISTING ELECTRIC BOX
	EXISTING ELECTRIC METER
	EXISTING ELECTRIC MARKER
	EXISTING UTILITY POLE
	EXISTING LIGHT POLE
CATV	EXISTING CABLE RISER
	EXISTING MAILBOX
	EXISTING FLAG POLE
	EXISTING SPOT ELEVATION
	EXISTING ASPHALT
	EXISTING WETLAND

GENERAL NOTES:

1. COMPARE ALL DISTANCES AND POINTS IN THE FIELD AND REPORT ANY DISCREPANCIES IN SAME TO SURVEYOR AT ONCE.
2. CALL 811 ("COMMON GROUND ALLIANCE" NATIONAL UNDERGROUND UTILITY LOCATOR SERVICE) FOR FIELD LOCATION OF UNDERGROUND UTILITY LINES PRIOR TO ANY DIGGING OR CONSTRUCTION.
3. NO DIMENSIONS SHOULD BE ASSUMED BY SCALING.
4. ADJACENT LAND OWNERS SHOWN HERE MONTGOMERY COUNTY GIS.

EXISTING CONDITIONS BASED ON BOUNDARY AND TOPOGRAPHIC SURVEY PREPARED BY ATWELL, LLC DATED **02/26/2025**.

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

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ATWELL
866.850.4200 www.atwell.com
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NAPERVILLE, IL 60563
630.577.0800
DESIGN FIRM #184000578-0010

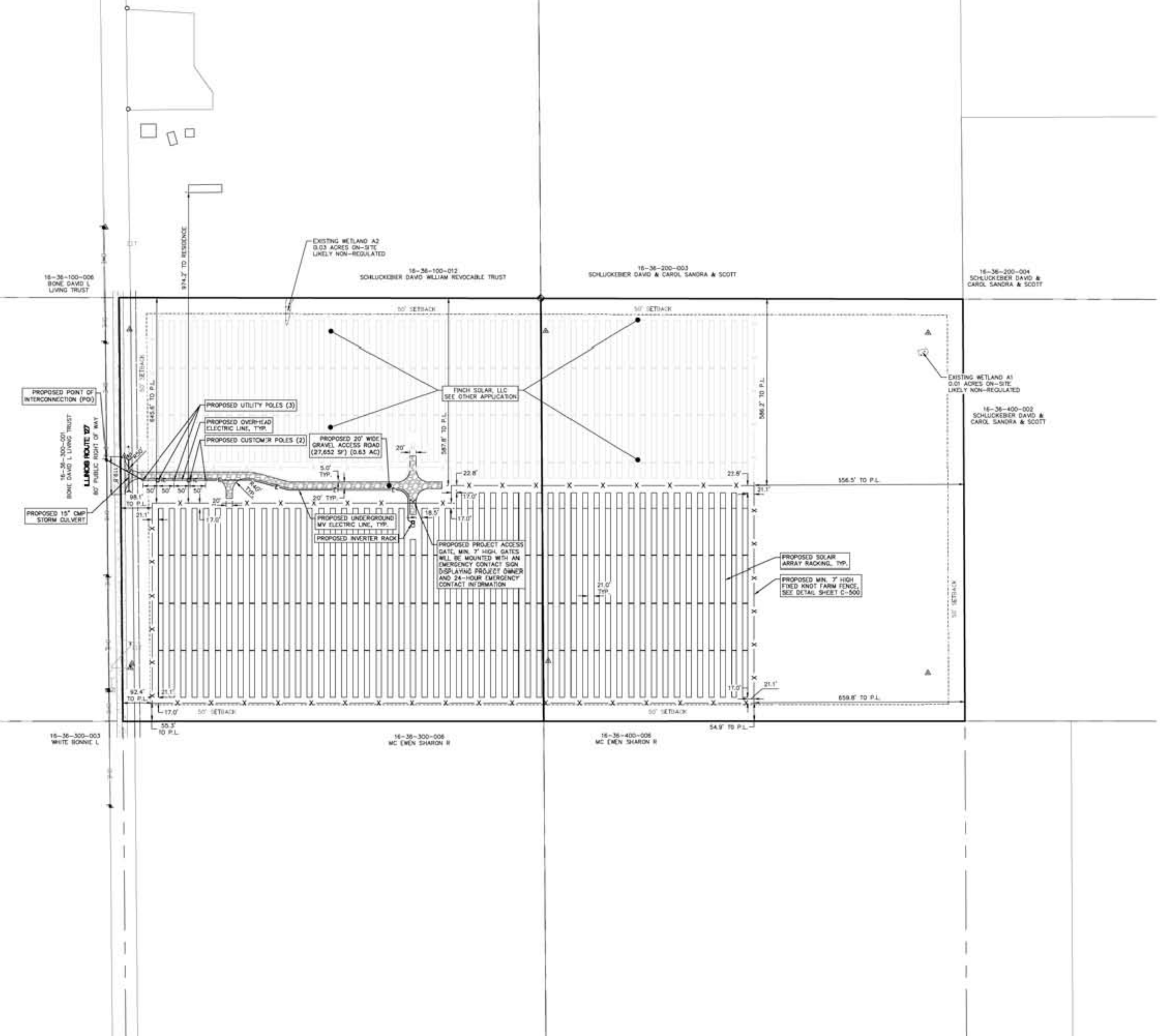
SECTION 36
TOWN 8 NORTH, RANGE 4 WEST
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

ATTRIBUTE: IRONWOOD RENEWABLES, LLC
ATTICUS SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
EXISTING CONDITIONS PLAN

DATE: MAY 12, 2025
REVISIONS

SCALE 0 75 150
1" = 150 FEET
DR. C.M.P. | CH. M.S.
P.M. M. KEITH
JOB 24009016
SHEET NO. C-100

NOT FOR CONSTRUCTION



LEGEND

- BOUNDARY LINE
- EXISTING ROW
- BOUNDARY ADJACENT LINE
- SECTION LINE
- EXISTING EASEMENT LINE
- EXISTING SETBACK LINE
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING UNDERGROUND TELEPHONE
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC LINE
- EXISTING UNDERGROUND ELECTRIC LINE
- PROPOSED UNDERGROUND ELECTRIC LINE
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- EXISTING DRAIN TILE
- EXISTING ASPHALT
- EXISTING WETLAND
- PROPOSED GRAVEL ACCESS DRIVE

EXISTING CONDITIONS BASED ON BOUNDARY AND TOPOGRAPHIC SURVEY PREPARED BY ATWELL, LLC DATED 02/26/2025.

SITE DATA

PIN:	16-36-300-002 & 16-36-400-001
JURISDICTION:	HILLSBORO TOWNSHIP, MONTGOMERY COUNTY
ZONING DISTRICT:	XXXXXX
CURRENT LAND USE:	AGRICULTURAL
PARCEL AREA:	± 80.63 ACRES
LIMITS OF DISTURBANCE:	± 33.7 ACRES
FENCED AREA:	± 28.5 ACRES
PROPOSED IMPERVIOUS AREA:	± 0.64 ACRES

FEMA FLOOD HAZARD: NOT IN FLOOD ZONE PER FHBM MAP #170092000BA DATED 01/09/1981.

SOLAR ZONING SETBACKS	REQUIRED	PROPOSED
FRONT (WEST):	50'	92.4'
SIDE (NORTH):	50'	586.2'
SIDE (SOUTH):	50'	54.9'
REAR (EAST):	50'	656.5'
NEAREST EDGE OF NON-PARTICIPATING RESIDENCE	150'	974.2'

ALL SETBACKS ARE MEASURED FROM THE EXTERIOR OF THE FENCING AND GATES AROUND THE PERIMETER OF THE SOLAR FARM. SOLAR PANEL ARRAYS SHALL BE NO MORE THAN THIRTY (30) FEET IN HEIGHT, NOT INCLUDING POWER LINES.

GENERAL NOTES

1. THE CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY CONSTRUCTION PERMITS. THE CONTRACTOR SHALL ALSO PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE SAME, AND COORDINATE WITH THE ENGINEER AND ARCHITECT AS REQUIRED.
2. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND ALL CONSTRUCTION MEANS AND METHODS.
3. LIMITS OF WORK SHALL BE EROSION CONTROL BARRIERS AS INDICATED ON DRAWINGS.
4. ANY ALTERATION TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE RECORDED BY THE CONTRACTOR ON RECORD DOCUMENTS.
5. ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO OWNER.
6. EXISTING TREES AND SHRUBS OUTSIDE THE FENCE LINE SHALL NOT BE CLEARED, UNLESS OTHERWISE NOTED. ALL EXISTING VEGETATION INSIDE FENCE LINE SHALL BE CLEARED AND GRUBBED.
7. FOR DRAWING LEGIBILITY, ALL EXISTING TOPOGRAPHIC FEATURES, EXISTING UTILITIES, PROPERTY BOUNDARIES, EASEMENTS, ETC. MAY NOT BE SHOWN ON ALL DRAWINGS. REFER TO ALL REFERENCED DRAWINGS AND OTHER DRAWINGS IN THIS SET FOR ADDITIONAL INFORMATION.

ZONING DISTRICT:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH CONDITIONS THAT MAY BE PROMULGATED BY THE MONTGOMERY COUNTY PLANNING DEPARTMENT, SOIL AND WATER CONSERVATION DISTRICT, AND MUNICIPAL AGENCIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING, SECURING AND COMPLIANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT, AS ADMINISTERED BY THE STATE ENVIRONMENTAL PROTECTION AGENCY.

LAYOUT AND MATERIALS NOTES:

1. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.
2. CONTRACTOR SHALL REPORT SIGNIFICANT CONFLICTS TO THE OWNER AND THE ENGINEER FOR RESOLUTION.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN SITE PLAN DIMENSIONS AND BUILDING PLANS BEFORE PROCEEDING WITH ANY PORTION OF SITE WORK WHICH MAY BE AFFECTED SO THAT PROPER ADJUSTMENTS TO THE SITE LAYOUT CAN BE MADE IF NECESSARY.
4. PROTECT EXISTING PROPERTY MONUMENTS AND ABUTTING PROPERTIES DURING CONSTRUCTION ACTIVITIES.

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

ATWELL
866.850.4200 www.atwell.com
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563
630.577.0800
DESIGN FIRM #184000578-0010

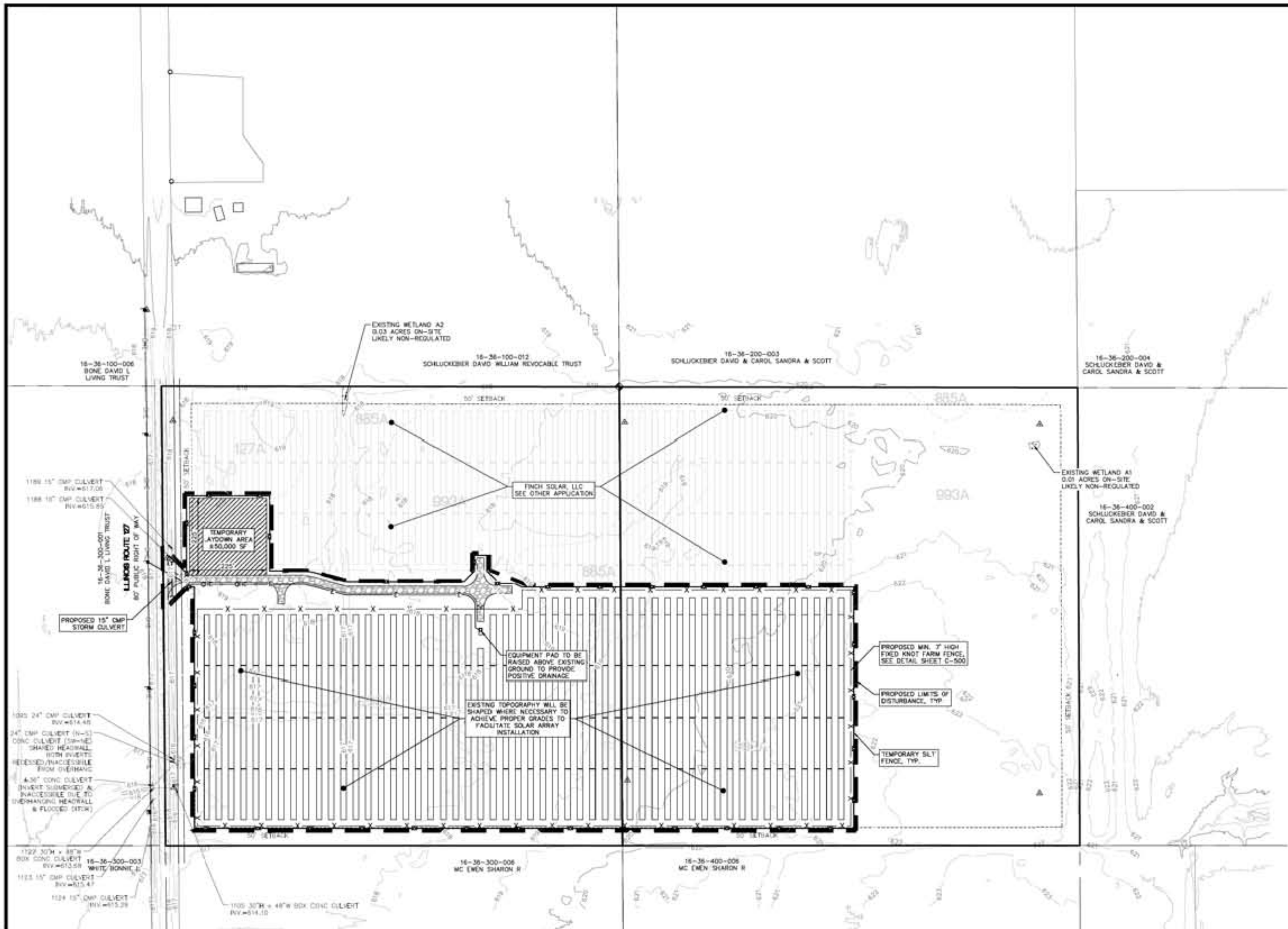
SECTION 36
TOWN 8 NORTH, RANGE 4 WEST
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

ATTRIBUTE IRONWOOD RENEWABLES, LLC
ATTICUS SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
SITE LAYOUT PLAN

NOT FOR CONSTRUCTION

DATE MAY 12, 2025
REVISIONS

SCALE 0 75 150
1" = 150 FEET
DR. C.M.P. CH. M.S.
P.M. M. KEITH
JOB 24009016
SHEET NO. C-200



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- EXISTING WETLAND BUFFER
- PROPOSED LIMITS OF DISTURBANCE
- EXISTING DRAIN TILE
- EXISTING ASPHALT
- EXISTING WETLAND
- PROPOSED GRAVEL ACCESS DRIVE
- TEMPORARY SILT FENCE
- APPROXIMATE LIMITS OF EXISTING SOIL TYPE

STORMWATER SUMMARY

PARCEL AREA: ± 80.6 ACRES
DISTURBED AREA: ± 33.7 ACRES
PROPOSED IMPERVIOUS AREA: ± 0.64 ACRES
AVERAGE EXISTING SOIL RATING: D

	EXISTING CONDITIONS	PROPOSED CONDITIONS
COVER:	STRAIGHT ROW CROPS	PASTURE/MEADOW
CN FOR SITE:	89	85

- THE DRAINAGE AREA WILL NOT BE ALTERED BETWEEN THE EXISTING CONDITIONS AND THE PROPOSED CONDITIONS.
- THE DIFFERENCE BETWEEN THE TIME OF CONCENTRATION OF THE EXISTING CONDITIONS AND THE PROPOSED CONDITIONS WILL BE NEGLIGIBLE.
- DUE TO THE LARGE REDUCTION IN THE CURVE NUMBER BETWEEN THE EXISTING AND PROPOSED CONDITIONS, THE PROPOSED RUNOFF WILL BE REDUCED, THUS CAUSING NO NEGATIVE IMPACTS ON THE DOWNSTREAM TRIBUTARY AREAS.
- NO DETENTION WILL BE REQUIRED FOR THE PROPOSED DEVELOPMENT.

GRADING, DRAINAGE AND UTILITY NOTES:

1. UNDERGROUND UTILITIES WERE COMPILED FROM AVAILABLE RECORD PLANS OF UTILITY COMPANIES AND PUBLIC AGENCIES, ARE APPROXIMATE AND ASSUMED. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "811" OR EQUIVALENT AND THE OWNER TO ACCURATELY LOCATE UNDERGROUND UTILITIES. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL BE DONE UNTIL UTILITY COMPANIES AND THE OWNER ARE PROPERLY NOTIFIED IN ADVANCE.
2. ALL SITE WORK SHALL MEET OR EXCEED THE SITE WORK SPECIFICATIONS TO BE PREPARED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED.
3. ALL WORK PERFORMED AND ALL MATERIALS FURNISHED SHALL CONFORM WITH THE LINES, GRADES AND OTHER SPECIFIC REQUIREMENTS OR SPECIFICATIONS FOR THE PROJECT AS SHOWN ON THE PLANS.
4. THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER AND ENGINEER FOR RESOLUTION.
5. CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION.
6. THE CONTRACTOR SHALL REMOVE ALL NON-BIODEGRADABLE EROSION CONTROL BARRIERS AFTER RE-VEGETATION OF DISTURBED AREAS.
7. WETLANDS ARE TO REMAIN UNDISTURBED. NO ENCROACHMENT PERMITTED UNLESS NOTED ON PLANS.
8. PITCH EVENLY BETWEEN SPOT GRADES.
9. THE CONTRACTOR SHALL SCHEDULE HIS WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PONDING. SPECIFICALLY, ALLOW WATER TO ESCAPE WHERE PROPOSED CURB MAY RETAIN RUNOFF PRIOR TO APPLICATION OF THE FINISH SUBGRADE AND/OR SURFACE PAVING. PROVIDE TEMPORARY POSITIVE DRAINAGE AS REQUIRED.
10. EXISTING SITE SURFACE DRAINAGE PATTERNS WILL BE MAINTAINED.

SOIL LEGEND

SOIL TYPE	SOIL GROUP	SOIL NAME
127A	C	HARRISON SILT LOAM, 0 TO 2 PERCENT SLOPES
885A	C/D	VIRDEN-FOSTERBURG SILT LOAMS, 0 TO 2 PERCENT SLOPES
993A	D	COWDEN-PIASA SILT LOAMS, 0 TO 2 PERCENT SLOPES

EXISTING CURVE NUMBER

SOIL RATING	COVER DESCRIPTION	CN (TR-55 TABLE 2-2)	AREA
C	ROW CROPS; STRAIGHT ROW (SR) GOOD	85	1.65
C/D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	4.56
D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	73.97
-	IMPERVIOUS AREAS	98	0.44
		COMBINED CN= 89	80.63

PROPOSED CURVE NUMBER

SOIL RATING	COVER DESCRIPTION	CN (TR-55 TABLE 2-2)	AREA
C	ROW CROPS; STRAIGHT ROW (SR) GOOD	85	1.59
C	PASTURE; GOOD	74	0.06
C/D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	3.59
C/D	PASTURE; GOOD	80	0.97
D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	41.37
D	PASTURE; GOOD	80	31.96
-	EXISTING IMPERVIOUS AREA	98	0.44
-	PROPOSED IMPERVIOUS AREA	98	0.64
		COMBINED CN= 85	80.63

EROSION CONTROL AND SEDIMENTATION NOTES:

1. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS INDICATED IN THE PLAN PRIOR TO THE COMMENCEMENT OF DEMOLITION OR CONSTRUCTION OPERATIONS.
2. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES DURING ENTIRE CONSTRUCTION PERIOD.
3. ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
4. ALL STOCKPILE AREAS SHALL BE LOCATED WITHIN LIMIT OF WORK LINE AND STABILIZED TO PREVENT EROSION.
5. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
6. SITE ELEMENTS TO REMAIN MUST BE PROTECTED FOR DURATION OF PROJECT.
7. ALL TOPSOIL ENCOUNTERED WITHIN THE LIMITS OF THE PROPOSED PERMANENT AND TEMPORARY GRAVEL ROADS, EQUIPMENT PAD AREA, AND AREAS OF CUT AND FILL SHALL BE STRIPPED AS NEEDED AND STOCKPILED FOR REUSE. EXCESS TOPSOIL SHALL BE DISPOSED OF ON SITE AS DIRECTED BY OWNER. TOPSOIL PILES SHALL REMAIN SEGREGATED FROM EXCAVATED SUBSURFACE SOIL MATERIALS.
8. ADDITIONAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
9. ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADS.
10. TEMPORARY DIVERSION DITCHES, PERMANENT DITCHES, CHANNELS, EMBANKMENTS, AND ANY DENUDED SURFACE WHICH WILL BE EXPOSED FOR AN EXTENDED PERIOD OF TIME SHALL BE STABILIZED AS REQUIRED.
11. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION TO ENSURE THAT CHANNELS, DITCHES, AND PIPES ARE CLEAR OF DEBRIS AND THAT THE EROSION CONTROL BARRIERS ARE INTACT.
12. DUST SHALL BE CONTROLLED AS NEEDED BY SPRINKLING OR OTHER APPROVED METHODS AS NECESSARY, OR AS DIRECTED BY THE OWNER OR REPRESENTATIVE.
13. CARE SHALL BE EXERCISED SO AS TO PREVENT ANY UNSUITABLE MATERIAL FROM MIGRATING OUTSIDE THE LIMIT OF WORK.
14. ADDITIONAL EROSION CONTROL SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR REPRESENTATIVE.
15. CLEAN AND MAINTAIN EROSION CONTROL BARRIER AS REQUIRED DURING CONSTRUCTION OPERATIONS TO ENSURE ITS CONTINUED FUNCTIONALITY.
16. OVERALL SITE DEVELOPMENT WILL MAINTAIN EXISTING TOPOGRAPHY AND STORM WATER DRAINAGE PATTERNS.
17. THE OVERALL DEVELOPMENT WILL BE RE-SEEDED AS NEEDED TO DEVELOP A PERMANENT VEGETATIVE COVER AS INDICATED ON THE LANDSCAPE PLAN. COVER CROP OR OTHER TEMPORARY STABILIZATION WILL BE IMPLEMENTED IN THE INTERIM.
18. NO CONSTRUCTION ACTIVITIES AS PART OF THE SITE DEVELOPMENT SHALL OCCUR WITHIN ANY DELINEATED WETLANDS OR WETLAND BUFFERS, AS REQUIRED BY THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES.
19. TOPOGRAPHIC INFORMATION IS BASED ON COUNTY AVAILABLE GIS INFORMATION.
20. ALL DRAIN TILES SHALL BE FIELD ADJUSTED TO AVOID THE SOLAR PANEL PILES. ANY DAMAGE TO THE DRAIN TILES SHALL BE REPAIRED. THE CONTRACTOR SHALL ENSURE ALL DRAIN TILES ARE CARRYING WATER AS INTENDED, ENSURING THAT NO UPSTREAM FLOODING WILL OCCUR DUE TO THE CONSTRUCTION OF THIS SITE.

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NOTICE:

ATWELL
866.850.4200 www.atwell.com
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563

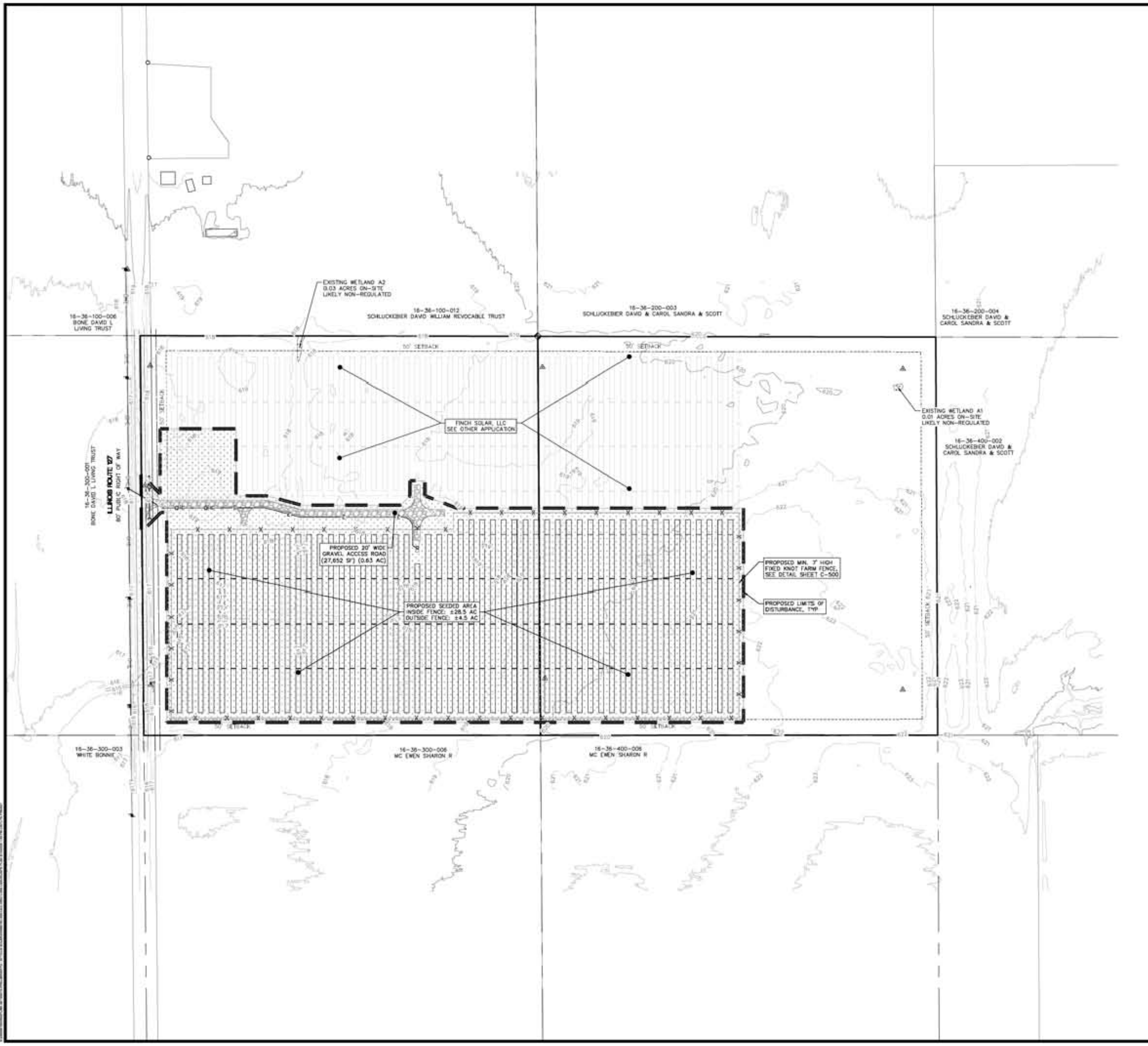
SECTION 36
TOWN 8 NORTH, RANGE 4 WEST
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

ATTRIBUTE: IRONWOOD RENEWABLES, LLC
ATTICUS SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
GRADING PLAN

NOT FOR CONSTRUCTION

DATE: MAY 12, 2025
REVISIONS

SCALE: 1" = 150 FEET
DR. C.M.P. CH. M.S.
P.M. M. KEITH
JOB 24006016
SHEET NO. C-300



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- EXISTING DRAIN TILE
- EXISTING ASPHALT
- EXISTING WETLAND
- PROPOSED GRAVEL ACCESS DRIVE
- PROPOSED SEED

PLANTING NOTES:

1. ALL STOCKPILE AREAS SHALL BE LOCATED WITHIN LIMIT OF WORK LINE AND STABILIZED TO PREVENT EROSION.
2. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF SITE.
3. PROVIDE CRIBBING AS NECESSARY TO PROTECT EXISTING UTILITY LINES DURING CONSTRUCTION.
4. PLANTING SEED SHALL BE SOWN IN SEASONAL CONDITIONS AS APPROPRIATE FOR GOOD SEED SURVIVAL, OR AT SUCH TIMES AS APPROVED BY THE OWNER.
5. PROTECT NEWLY TOPSOILED, GRADED AND/OR SEEDED AREAS FROM TRAFFIC AND EROSION. KEEP AREAS FREE OF TRASH AND DEBRIS RESULTING FROM LANDSCAPE CONTRACTOR OPERATIONS.
6. REPAIR AND RE-ESTABLISH GRADES IN SETTLED, ERODED AND RUTTED AREAS TO THE SPECIFIED GRADE AND TOLERANCES.
7. ALL PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
8. ANY PROPOSED SUBSTITUTIONS OF PLANT MATERIAL SHALL BE MADE WITH MATERIAL EQUIVALENT TO THE DESIRED MATERIAL IN OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER, LEAF, COLOR, FRUIT AND CULTURE. PROPOSED SUBSTITUTIONS WILL ONLY BE CONSIDERED IF SUBMITTED WITH ENUMERATED REASONS WHY SUBSTITUTIONS ARE PROPOSED.
9. THE LANDSCAPE CONTRACTOR SHALL CLEAN UP AND REMOVE ANY DEBRIS FROM THE SITE CAUSED BY THE LANDSCAPE CONTRACTOR.
10. FOLLOWING VEGETATION DIE-BACK, THE SOIL SHALL BE LIGHTLY PREPPED WITH DISKS AND HARROWS IN ORDER TO CREATE A VIABLE SEEDBED. IN SOME CASES OF EXTREME COMPACTION, THE SITE SHOULD BE DECOMPACTED WITH THE USE OF SOIL RIPPERS TO BREAK UP THE SOIL.
11. PLANTING SEED SHALL BE SOWN IN SEASONAL CONDITIONS AS APPROPRIATE FOR GOOD SEED SURVIVAL, OR AT SUCH TIMES AS APPROVED BY THE OWNER.

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DESIGN FIRM #184005578-0010

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MONTGOMERY COUNTY, ILLINOIS

ATTRIBUTE: IRONWOOD RENEWABLES, LLC
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SOLAR FARM DEVELOPMENT PERMIT PLANS
LANDSCAPE PLAN

DATE: MAY 12, 2025
REVISIONS

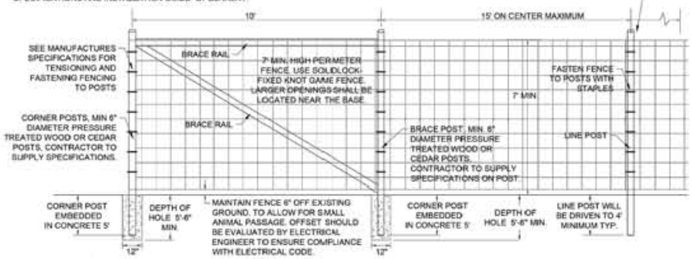
SCALE 0 75 150
1" = 150 FEET

DR. C.M.P. | CH. M.S.
P.M. M. KEITH
JOB 24009016
SHEET NO. C-400

NOT FOR CONSTRUCTION

FENCE MATERIAL:
SOLIDLOCK FIXED KNOT GAME FENCE SPECIFICATION
- FENCE FABRIC SHALL BE BEKAERT ZA-6" FIXED KNOT GAME FENCE
- 96" HIGH
- 12.5 GAUGE WIRE
- CLASS 3 GALVANIZED

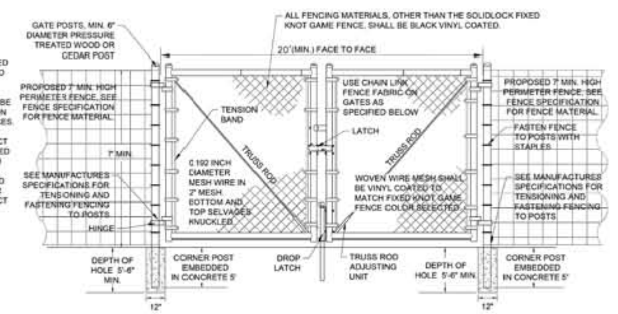
INSTALL ALL FENCE COMPONENTS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. SEE "FIXED KNOT BRACE SPECIFICATIONS AND INSTALLATION GUIDE" BY BEKAERT



TYPICAL FIXED KNOT GAME FENCE
NOT TO SCALE

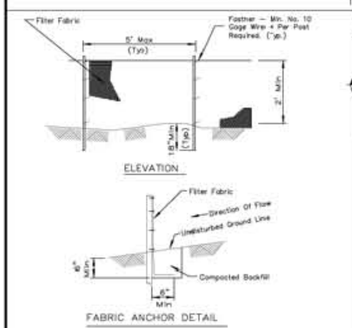
NOTES
1. ADDITIONAL BRACING MAY BE REQUIRED ON LONGER FENCE RUNS. CONTRACTOR TO ADD ADDITIONAL BRACING WHEN CONTRACTOR OBSERVES CORNER POST DEFLECTION DURING FENCE TENSIONING/FASTENING.
2. FABRIC TO BE FASTENED TO POSTS WITH STAPLES APPROVED BY THE ENGINEER.

NOTES
1. PAINT ALL GALVANIZED PIPE AND FITTINGS TO MATCH SOLIDLOCK FIXED KNOT GAME FENCE. PAINT SHALL BE SUITABLE FOR USE ON GALVANIZED SURFACES.
2. EMERGENCY CONTACT SIGN SHALL BE PLACED ON THE GATE, WHICH IDENTIFIES THE PROJECT OWNER AND PROVIDES A 24-HOUR EMERGENCY CONTACT PHONE NUMBER.



DOUBLE SWING GATE
NOT TO SCALE

SILT FENCE PLAN



NOTES:
1. Temporary sediment fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilizations.
2. Filter fabric shall meet the requirements of materials specification 592 Geotextile Table 1 or 2, Class I with equivalent opening size of lease 30 for nonwoven and 40 for woven.
3. Fence posts shall be either standard steel posts or wood post with minim cross sectional area of 3.0 sq. in.

REFERENCE Project Designed ______ Date ______ Checked ______ Date ______ Approved ______ Date ______		STANDARD DWG. NO. IUM-620A SHEET 1 OF 2 DATE 5-16-2013

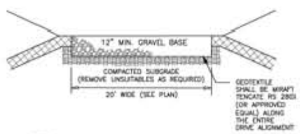
MAINTENANCE:

SILT FENCE SHALL BE REMOVED ONCE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

SILT FENCE SHALL BE INSPECTED NO LESS FREQUENTLY THAN EVERY WEEK DURING CONSTRUCTION. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE FENCE STILL IS NECESSARY, THE FABRIC OR THE ENTIRE SYSTEM SHALL BE REPLACED PROMPTLY.

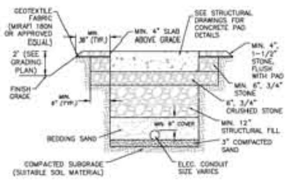
SEDIMENT DEPOSITS MUST BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF THE HEIGHT OF THE SILT FENCE.

ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, A SEEDBED PREPARED AND THE SITE VEGETATED.

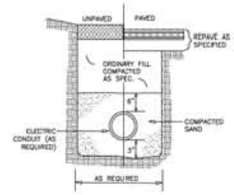


NOTES:
1. REMOVE TOPSOIL AND ALL UNSUITABLE MATERIAL AS REQUIRED AND REPLACE WITH GRAVEL.
2. ACCESS DRIVES TO SLOPE IN THE DIRECTION OF THE EXISTING GRADE AT A MINIMUM OF 2.0% DRIVEWAY SHALL BE GRADED TO ALLOW STORMWATER TO SHEET ACROSS IT AND TO PREVENT PUDDLING.

ACCESS DRIVE CROSS SECTION
NOT TO SCALE



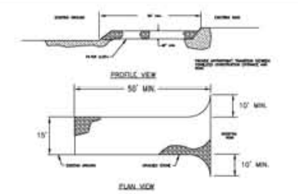
EQUIPMENT FOUNDATION DETAIL
NOT TO SCALE



ELECTRIC CONDUIT TRENCH
NOT TO SCALE

TYPICAL "DANGER" WARNING SIGN
NOT TO SCALE

TYPICAL EMERGENCY CONTACT SIGN
NOT TO SCALE



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE PROPOSED ENTRANCE.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARDS THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE SURFACE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO EXISTING ROAD. THIS MANY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO EXISTING ROAD SHALL BE REMOVED IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

811
Know what's below. Call before you dig.

ATWELL
866.850.4200 www.atwell.com

SECTION 36
TOWN 8 NORTH, RANGE 4 WEST
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

ATTRIBUTE: IRONWOOD RENEWABLES, LLC
ATTICUS SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
DETAILS

NOT FOR CONSTRUCTION

DATE MAY 12, 2025
REVISIONS

SCALE N.T.S.
DR. C.M.P. CH. M.S.
P.M. M. KEITH
JOB 24009016
SHEET NO. C-500

Exhibit D: Decommissioning Plan

DECOMMISSIONING PLAN

ATTICUS SOLAR, LLC

HILLSBORO TOWNSHIP, MONTGOMERY COUNTY, ILLINOIS

Prepared for:
Ironwood Renewables, LLC
Contact: Keith Morel

Engineering Estimate Prepared by:
Michael Keith, P.E.
Project Manager
ATWELL, LLC
630.281.8424 Office
571.239.0371 Mobile
1250 E. Diehl Road | Suite 300 | Naperville, IL 60563
Email: mkeith@atwell.com

Prepared: May 2025

1.0 INTRODUCTION

Background

Atticus Solar, LLC ("Applicant"), a wholly owned entity of Ironwood Projects, LLC, respectfully submits this Decommissioning Plan for the proposed 5 MWac solar project located in Hillsboro Township, Montgomery County, Illinois ("Project"). The Project is sited on approximately 80 acres of agricultural land. The design follows the setback requirements outlined in Section F.2.f. of the Montgomery County Solar Ordinance No. 2023-23.

This Plan is provided in accordance with the Montgomery County Zoning Ordinance and the Agricultural Impact Mitigation Agreement (AIMA), addressing:
- Removal of infrastructure both above and below ground
- Soil compaction repair and erosion prevention
- Management of access roads and vegetation control
- Financial assurance for decommissioning obligations

Per the AIMA, complete removal and restoration are required within twelve (12) months following the end of the Project's operational life.

2.0 PROJECT COMPONENTS

The Project elements subject to decommissioning include:
- Solar Photovoltaic (PV) Modules:
  Single-axis tracker-mounted modules anchored on driven steel piles.
- Electrical Collection System:
  DC power from modules collected via combiner boxes, routed to inverters, and converted to AC. Transformers and switchgear mounted on concrete pads.
- Site Grading and Drainage:
  Minimal earthwork anticipated; construction per Final Civil Plans.
- Access Roads:
  Gravel internal roads accessing the site from [Road Name].
- Fencing:
  A minimum 6-foot fence with a secured entrance gate surrounding the project footprint.

3.0 DECOMMISSIONING AND RECYCLING PLAN

Preparation for Decommissioning
Prior to dismantling activities, a site assessment will be conducted. Temporary debris storage will be designated onsite before final recycling or disposal.

Permits and Approvals
Required permits, such as an NPDES Permit and a Stormwater Pollution Prevention Plan (SWPPP) from IEPA, will be obtained. Federal permits are not anticipated.

Removal and Recycling Procedures
- PV Modules and Mounting Systems:
  Modules will be removed and either recycled or properly disposed. Steel pile foundations will be fully extracted or cut off a minimum of five feet below grade if full removal is impractical.
- Electrical Equipment:
  Inverters, transformers, and cables will be dismantled. Concrete pads will be broken up and recycled.
- Roadways:
  Gravel will be removed and recycled. Soils beneath roads will be decompacted by scarifying to a depth of 18 inches.
- Fencing:
  All fencing, including posts and gates, will be dismantled and removed.
- Landscaping and Vegetation:
  Installed vegetation and screening elements will be cleared unless requested to remain by the landowner. Weed-control fabrics will be removed.

Site Restoration
After infrastructure removal, disturbed areas will be regraded, topsoil replaced, and seeded with appropriate vegetation to restore the site to agricultural use. Drain tile systems impacted by decommissioning will be repaired promptly.

4.0 FUTURE LAND USE

The Project site will be restored to pre-existing agricultural conditions in accordance with the signed Agricultural Impact Mitigation Agreement (AIMA) with the Illinois Department of Agriculture. This commitment ensures the land is suitable for farming following decommissioning.

5.0 DECOMMISSIONING COST ESTIMATE AND FINANCIAL ASSURANCE

To comply with the AIMA and Montgomery County Ordinance No. 2023-23, the Applicant will provide an engineering estimate of present-day decommissioning costs and financial assurance.

IRONWOOD RENEWABLES

EXHIBIT A
Engineer's Opinion of Decommissioning Cost with Salvage

ATWELL

Atwell, L.L.C.
1250 East Diehl Road, Suite 300
(630) 577-0800

Project	Atticus Solar
Location:	Montgomery County, IL
Site:	5.0 MW (AC)
Parcel ID:	16-36-300-002 & 16-36-400-001
Date	4/30/2025

Engineer's Opinion of Probable Decommissioning Cost for Atticus Solar During First 5 Years of Operation

	Estimated Quantity	Unit	Unit Cost	Removal Cost	Salvage Value based on 5-year projections: Material Weight (lbs.)	Material Recycle Value	Net Salvage	Net Cost	Notes
Erosion Control/Contractor Fees									
Mobilization	1	LUMP SUM	$10,000.00	$10,000.00			$0.00	$10,000.00	
Electrical Disconnect	1	EACH	$750.00	$750.00			$0.00	$750.00	
Permitting (NPDES)	1	LUMP SUM	$1,200.00	$1,200.00			$0.00	$1,200.00	
Silt Fence	2,492	LF	$6.00	$14,952.00			$0.00	$14,952.00	Silt fence for access road removal
Seeding	1.58	ACRES	$800.00	$1,261.31			$0.00	$1,261.31	Seeding access road removal only
Sub-Total				$28,163.31			$0.00	$28,163.31	
Site Demolition									
Remove Existing Culvert	100	LF	$15.00	$1,500.00			$0.00	$1,500.00	
Remove Existing Storm Structure	2	EACH	$500.00	$1,000.00			$0.00	$1,000.00	
Remove Existing Fence (8' High Fixed Knot Farm Fence)	5,135	LF	$3.85	$19,769.75	28,756	$0.09	$2,588.04	$17,181.71	
Remove Existing Gravel Entrance (12" depth)	1,077	CY	$4.00	$4,307.38			$0.00	$4,307.38	
Haul off for Existing Gravel Entrance (12" depth)	1,077	CY	$10.00	$10,768.46			$0.00	$10,768.46	
Sub-Total				$37,345.59			$2,588.04	$34,757.55	
Racking and Module Removal									
Pile Removal	2,400	EACH	$8.00	$19,200.00	1,260,000	$0.04	$47,250.00	($28,050.00)	Assumes W10x35 I-beams at 15' long = 525 lbs. each @ $0.0375/lb
Assembly Removal	674	EACH	$60.00	$40,435.20	101,088	$0.04	$3,790.80	$36,644.40	Assumes 150 lbs. each @ $0.0375/lb
PV Module Removal	16,848	EACH	$1.25	$21,060.00		$2,779,920.00	$2,779,920.00	($2,758,860.00)	Assumes 75% of original value ($220 original value)
PV Module Haul Off	539	TON	$45.00	$24,261.12			$0.00	$24,261.12	
Sub-Total				$104,956.32			$2,830,960.80	($2,726,004.48)	
Wiring Removal									
Utility Pole Removal	5	EACH	$750.00	$3,750.00			$0.00	$3,750.00	
Underground AL	36,837	LF	$2.00	$73,674.00	7,367.40	$0.30	$2,210.22	$71,463.78	Underground aluminum wire
Underground CU	11,943	LF	$2.00	$23,886.00	2,388.60	$1.80	$4,299.48	$19,586.52	Underground copper wire
Above Ground CU	121,998	LF	$0.10	$12,199.80	24,399.60	$1.80	$43,919.28	($31,719.48)	Aboveground copper wire
Above Ground AL	304	LF	$0.10	$30.40	15.81	$0.30	$4.74	$25.66	Aboveground aluminum wire
Combiner Box Removal	20	EACH	$80.00	$1,600.00		$400.00	$400.00	$1,200.00	
Sub-Total				$115,140.20			$50,833.72	$64,306.48	
Power Conditioning Equipment Removal									
PCU Station (inverters, etc.)	20	EACH	$800.00	$16,000.00		$75,000.00	$75,000.00	($59,000.00)	Assumes 50% of original value ($7,500 original value)
Scada Equipment	1	EACH	$500.00	$500.00		$1,000.00	$1,000.00	($500.00)	
Transformer	1	EACH	$3,000.00	$3,000.00		$75,000.00	$75,000.00	($72,000.00)	Assumes 50% of original value ($150,000 original value)
Sub-Total				$19,500.00			$151,000.00	($131,500.00)	
Equipment Pad Removal									
Remove Pad	1	EACH	$750.00	$750.00			$0.00	$750.00	
Sub-Total				$750.00			$0.00	$750.00	
DECOMMISSIONING TOTAL				**$305,855.42**			**$3,035,382.56**	**($2,729,527.14)**	

Assumptions:
1. Cost Estimate based on 5-year projections.
2. Cost Estimate based on the Solar Farm Development Permit Plans prepared by Atwell, LLC dated 04/28/2025.
3. Refer to Decommissioning Plan for further information.

Note: This Engineer's Opinion of Probable Cost is made on the basis of Engineer's experience and qualifications using estimated quantities and represents Engineer's best judgment as an experienced and qualified professional Engineer generally familiar with the construction industry. However, since Engineer has no control over the cost of labor, materials, equipment, or services furnished by others, or over the Contractor's methods of determining prices, or over competitive bidding or market conditions, or over quantities of work actually performed, Engineer cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from Opinions of Probable Construction Cost prepared by Engineer. This Opinion of Probable Construction Cost is limited to those items stated herein.

MICHAEL BRIAN KEITH
062-066723
LICENSED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

Exp. 11/30/25

4/30/25

Exhibit E: Agricultural Impact Mitigation Agreement (AIMA)

Gmail

Keith Morel <kmorel@ironwoodenergy.com>

Atticus Solar, LLC (Montgomery) Solar facility

1 message

Evers, Jeff <Jeff.Evers@illinois.gov> Thu, Feb 13, 2025 at 4:25 PM
To: Keith Morel <kmorel@ironwoodenergy.com>
Cc: "Nordsiek, Clay" <Clay.Nordsiek@illinois.gov>, "EXT Bodine, Bill" <bbodine@ilfb.org>, "EXT Harmon, Laura" <lharmon@ilfb.org>, "Thalgott, Garrett" <GThalgott@ilfb.org>, "kwilson@montcofb.com" <kwilson@montcofb.com>, "Cauble, Melissa - FPAC-NRCS, IL" <Melissa.Cauble@il.nacdnet.net>, "Moore, Nikki R." <Nikki.Moore@illinois.gov>

Good afternoon,

Please see the attached executed AIMA and Landowner letter for your reference.

Please don't hesitate to contact me if you have any questions or comments.

Best Regards,

Jeff

JEFFREY EVERS | AGRICULTURAL LAND & WATER RESOURCE SPECIALIST III

Land and Water Resources

Illinois Department of Agriculture

John R. Block Building | 801 E. Sangamon Ave., P.O. Box 19281 | Springfield, IL 62794-9281

(O) 217-785-5594 | (F) 217-557-0993 | (TTY) 866-287-2999 | jeff.evers@illinois.gov

2 attachments

Atticus Solar, LLC (Montgomery) 2025 AIMA.pdf
484K

Atticus Solar, LLC (Montgomery) 2025 LO Letter.pdf
58K

STANDARD AGRICULTURAL IMPACT MITIGATION AGREEMENT
between
Atticus Solar, LLC

and the
ILLINOIS DEPARTMENT OF AGRICULTURE
Pertaining to the Construction of a Commercial Solar Energy Facility
in
Montgomery County, Illinois

Pursuant to the Renewable Energy Facilities Agricultural Impact Mitigation Act (505 ILCS 147), the following standards and policies are required by the Illinois Department of Agriculture (IDOA) to help preserve the integrity of any Agricultural Land that is impacted by the Construction and Deconstruction of a Commercial Solar Energy Facility. They were developed with the cooperation of agricultural agencies, organizations, Landowners, Tenants, drainage contractors, and solar energy companies to comprise this Agricultural Impact Mitigation Agreement (AIMA).

Atticus Solar, LLC, hereafter referred to as Commercial Solar Energy Facility Owner, or simply as Facility Owner, plans to develop and/or operate a 5 MW Commercial Solar Energy Facility in Montgomery County [GPS Coordinates: 39.091633, -89.482668], which will consist of up to 80 acres that will be covered by solar facility related components, such as solar panel arrays, racking systems, access roads, an onsite underground collection system, inverters and transformers and any affiliated electric transmission lines. This AIMA is made and entered between the Facility Owner and the IDOA.

If Construction does not commence within four years after this AIMA has been fully executed, this AIMA shall be revised, with the Facility Owner's input, to reflect the IDOA's most current Solar Farm Construction and Deconstruction Standards and Policies. This AIMA, and any updated AIMA, shall be filed with the County Board by the Facility Owner prior to the commencement of Construction.

The below prescribed standards and policies are applicable to Construction and Deconstruction activities occurring partially or wholly on privately owned agricultural land.

Conditions of the AIMA

The mitigative actions specified in this AIMA shall be subject to the following conditions:

A. All Construction or Deconstruction activities may be subject to County or other local requirements. However, the specifications outlined in this AIMA shall be the minimum standards applied to all Construction or Deconstruction activities. IDOA may utilize any legal means to enforce this AIMA.

B. Except for Section 17. B. through F., all actions set forth in this AIMA are subject to modification through negotiation by Landowners and the Facility Owner, provided such changes are negotiated in advance of the respective Construction or Deconstruction activities.

C. The Facility Owner may negotiate with Landowners to carry out the actions that Landowners wish to perform themselves. In such instances, the Facility Owner shall offer Landowners the area commercial rate for their machinery and labor costs.

D. All provisions of this AIMA shall apply to associated future Construction, maintenance, repairs, and Deconstruction of the Facility referenced by this AIMA.

E. The Facility Owner shall keep the Landowners and Tenants informed of the Facility's Construction and Deconstruction status, and other factors that may have an impact upon their farming operations.

F. The Facility Owner shall include a statement of its adherence to this AIMA in any environmental assessment and/or environmental impact statement.

G. Execution of this AIMA shall be made a condition of any Conditional/Special Use Permit. Not less than 30 days prior to the commencement of Construction, a copy of this AIMA shall be provided by the Facility Owner to each Landowner that is party to an Underlying Agreement. In addition, this AIMA shall be incorporated into each Underlying Agreement.

H. The Facility Owner shall implement all actions to the extent that they do not conflict with the requirements of any applicable federal, state and local rules and regulations and other permits and approvals that are obtained by the Facility Owner for the Facility.

I. No later than 45 days prior to the Construction and/or Deconstruction of a Facility, the Facility Owner shall provide the Landowner(s) with a telephone number the Landowner can call to alert the Facility Owner should the Landowner(s) have questions or concerns with the work which is being done or has been carried out on his/her property.

J. If there is a change in ownership of the Facility, the Facility Owner assuming ownership of the Facility shall provide written notice within 90 days of ownership transfer, to the Department, the County, and to Landowners of such change. The Financial Assurance requirements and the other terms of this AIMA shall apply to the new Facility Owner.

K. The Facility Owner shall comply with all local, state and federal laws and regulations, specifically including the worker protection standards to protect workers from pesticide exposure.

L. Within 30 days of execution of this AIMA, the Facility Owner shall use Best Efforts to provide the IDOA with a list of all Landowners that are party to an Underlying Agreement and known Tenants of said Landowner who may be affected by the Facility. As the list of Landowners and Tenants is updated, the Facility Owner shall notify the IDOA of any additions or deletions.

M. If any provision of this AIMA is held to be unenforceable, no other provision shall be affected by that holding, and the remainder of the AIMA shall be interpreted as if it did not contain the unenforceable provision.

Definitions

Abandonment	When Deconstruction has not been completed within 12 months after the Commercial Solar Energy Facility reaches the end of its useful life. For purposes of this definition, a Commercial Solar Energy Facility shall be presumed to have reached the end of its useful life if the Commercial Solar Energy Facility Owner fails, for a period of 6 consecutive months, to pay the Landowner amounts owed in accordance with an Underlying Agreement.

Aboveground Cable	Electrical power lines installed above ground surface to be utilized for conveyance of power from the solar panels to the solar facility inverter and/or point of interconnection to utility grid or customer electric meter.
Agricultural Impact Mitigation Agreement (AIMA)	The Agreement between the Facility Owner and the Illinois Department of Agriculture (IDOA) described herein.
Agricultural Land	Land used for Cropland, hayland, pastureland, managed woodlands, truck gardens, farmsteads, commercial ag-related facilities, feedlots, livestock confinement systems, land on which farm buildings are located, and land in government conservation programs used for purposes as set forth above.
Best Efforts	Diligent, good faith, and commercially reasonable efforts to achieve a given objective or obligation.
Commercial Operation Date	The calendar date of which the Facility Owner notifies the Landowner, County, and IDOA in writing that commercial operation of the facility has commenced. If the Facility Owner fails to provide such notifications, the Commercial Operation Date shall be the execution date of this AIMA plus 6 months.
Commercial Solar Energy Facility (Facility)	A solar energy conversion facility equal to or greater than 500 kilowatts in total nameplate capacity, including a solar energy conversion facility seeking an extension of a permit to construct granted by a county or municipality before June 29, 2018. "Commercial solar energy facility" does not include a solar energy conversion facility: (1) for which a permit to construct has been issued before June 29, 2018; (2) that is located on land owned by the commercial solar energy facility owner; (3) that was constructed before June 29, 2018; or (4) that is located on the customer side of the customer's electric meter and is primarily used to offset that customer's electricity load and is limited in nameplate capacity to less than or equal to 2,000 kilowatts.
Commercial Solar Energy Facility Owner deemed (Facility Owner)	A person or entity that owns a commercial solar energy facility. A Commercial Solar Energy Facility Owner is not nor shall it be to be a public utility as defined in the Public Utilities Act.
County	The County or Counties where the Commercial Solar Energy Facility is located.
Construction	The installation, preparation for installation and/or repair of a Facility.
Cropland	Land used for growing row crops, small grains or hay; includes land which was formerly used as cropland, but is currently enrolled in a government conservation program; also includes pastureland that is classified as Prime Farmland.

Deconstruction	The removal of a Facility from the property of a Landowner and the restoration of that property as provided in the AIMA.
Deconstruction Plan	A plan prepared by a Professional Engineer, at the Facility's expense, that includes: (1) the estimated Deconstruction cost, in current dollars at the time of filing, for the Facility, considering among other things: i. the number of solar panels, racking, and related facilities involved; ii. the original Construction costs of the Facility; iii. the size and capacity, in megawatts of the Facility; iv. the salvage value of the facilities (if all interests in salvage value are subordinate to that of the Financial Assurance holder if abandonment occurs); v. the Construction method and techniques for the Facility and for other similar facilities; and (2) a comprehensive detailed description of how the Facility Owner plans to pay for the Deconstruction of the Facility.
Department	The Illinois Department of Agriculture (IDOA).
Financial Assurance	A reclamation or surety bond or other commercially available financial assurance that is acceptable to the County, with the County or Landowner as beneficiary.
Landowner	Any person with an ownership interest in property that is used for agricultural purposes and that is party to an Underlying Agreement.
Prime Farmland	Agricultural Land comprised of soils that are defined by the USDA Natural Resources Conservation Service (NRCS) as "Prime Farmland" (generally considered to be the most productive soils with the least input of nutrients and management).
Professional Engineer	An engineer licensed to practice engineering in the State of Illinois.
Soil and Water Conservation District (SWCD)	A unit of local government that provides technical and financial assistance to eligible Landowners for the conservation of soil and water resources.
Tenant	Any person, apart from the Facility Owner, lawfully residing or leasing/renting land that is subject to an Underlying Agreement.
Topsoil	The uppermost layer of the soil that has the darkest color or the highest content of organic matter; more specifically, it is defined as the "A" horizon.
Underlying Agreement	The written agreement between the Facility Owner and the Landowner(s) including, but not limited to, an easement, option, lease, or license under the terms of which another person has constructed, constructs, or intends to construct a Facility on the property of the Landowner.

Underground Cable	Electrical power lines installed below the ground surface to be utilized for conveyance of power within a Facility or from a Commercial Solar Energy Facility to the electric grid.
USDA Natural Resources Conservation Service (NRCS)	An agency of the United States Department of Agriculture that provides America's farmers with financial and technical assistance to aid with natural resources conservation.

Construction and Deconstruction Standards and Policies

1. Support Structures

A. Only single pole support structures shall be used for the Construction and operation of the Facility on Agricultural Land. Other types of support structures, such as lattice towers or H-frames, may be used on nonagricultural land.

B. Where a Facility's Aboveground Cable will be adjacent and parallel to highway and/or railroad right-of-way, but on privately owned property, the support structures shall be placed as close as reasonably practicable and allowable by the applicable County Engineer or other applicable authorities to the highway or railroad right-of-way. The only exceptions may be at jogs or weaves on the highway alignment or along highways or railroads where transmission and distribution lines are already present.

C. When it is not possible to locate Aboveground Cable next to highway or railroad right-of-way, Best Efforts shall be expended to place all support poles in such a manner to minimize their placement on Cropland (i.e., longer than normal above ground spans shall be utilized when traversing Cropland).

2. Aboveground Facilities

Locations for facilities shall be selected in a manner that is as unobtrusive as reasonably possible to ongoing agricultural activities occurring on the land that contains or is adjacent to the Facility.

3. Guy Wires and Anchors

Best Efforts shall be made to place guy wires and their anchors, if used, out of Cropland, pastureland and hayland, placing them instead along existing utilization lines and on land other than Cropland. Where this is not feasible, Best Efforts shall be made to minimize guy wire impact on Cropland. All guy wires shall be shielded with highly visible guards.

4. Underground Cabling Depth

A. Underground electrical cables located outside the perimeter of the (fence) of the solar panels shall be buried with:

1. a minimum of 5 feet of top cover where they cross Cropland.
2. a minimum of 5 feet of top cover where they cross pastureland or other non-Cropland classified as Prime Farmland.
3. a minimum of 3 feet of top cover where they cross pastureland and other Agricultural Land not classified as Prime Farmland.

4. a minimum of 3 feet of top cover where they cross wooded/brushy land.

B. Provided that the Facility Owner removes the cables during Deconstruction, underground electric cables may be installed to a minimum depth of 18 inches:

1. Within the fenced perimeter of the Facility; or

2. When buried under an access road associated with the Facility provided that the location and depth of cabling is clearly marked at the surface.

C. If Underground Cables within the fenced perimeter of the solar panels are installed to a minimum depth of 5 feet, they may remain in place after Deconstruction.

5. Topsoil Removal and Replacement

A. Any excavation shall be performed in a manner to preserve topsoil. Best Efforts shall be made to store the topsoil near the excavation site in such a manner that it will not become intermixed with subsoil materials.

B. Best Efforts shall be made to store all disturbed subsoil material near the excavation site and separate from the topsoil.

C. When backfilling an excavation site, Best Efforts shall be used to ensure the stockpiled subsoil material will be placed back into the excavation site before replacing the topsoil.

D. Refer to Section 7 for procedures pertaining to rock removal from the subsoil and topsoil.

E. Refer to Section 8 for procedures pertaining to the repair of compaction and rutting of the topsoil.

F. Best Efforts shall be performed to place the topsoil in a manner so that after settling occurs, the topsoil's original depth and contour will be restored as close as reasonably practicable. The same shall apply where excavations are made for road, stream, drainage ditch, or other crossings. In no instance shall the topsoil materials be used for any other purpose unless agreed to explicitly and in writing by the Landowner.

G. Based on the mutual agreement of the landowner and Facility Owner, excess soil material resulting from solar facility excavation shall either be removed or stored on the Landowner's property and reseeded per the applicable National Pollution Discharge Elimination System (NPDES) permit/Stormwater Pollution Prevention Plan (SWPPP). After the Facility reaches the end of its Useful Life, the excess subsoil material shall be returned to an excavation site or removed from the Landowner's property, unless otherwise agreed to by Landowner.

6. Rerouting and Permanent Repair of Agricultural Drainage Tiles

The following standards and policies shall apply to underground drainage tile line(s) directly or indirectly affected by Construction and/or Deconstruction:

A. Prior to Construction, the Facility Owner shall work with the Landowner to identify drainage tile lines traversing the property subject to the Underlying Agreement to the extent reasonably practicable. All drainage tile lines identified in this manner shall be shown on the Construction and Deconstruction Plans.

B. The location of all drainage tile lines located adjacent to or within the footprint of the Facility shall be recorded using Global Positioning Systems (GPS) technology. Within 60 days after Construction is complete, the Facility Owner shall provide the Landowner, the IDOA, and the respective County Soil and Water Conservation District (SWCD) with "as built" drawings (strip maps) showing the location of all drainage tile lines by survey station encountered in the Construction of the Facility, including any tile line repair location(s), and any underground cable installed as part of the Facility.

C. **Maintaining Surrounding Area Subsurface Drainage**

If drainage tile lines are damaged by the Facility, the Facility Owner shall repair the lines or install new drainage tile line(s) of comparable quality and cost to the original(s), and of sufficient size and appropriate slope in locations that limit direct impact from the Facility. If the damaged tile lines cause an unreasonable disruption to the drainage system, as determined by the Landowner, then such repairs shall be made promptly to ensure appropriate drainage. Any new line(s) may be located outside of, but adjacent to the perimeter of the Facility. Disrupted adjacent drainage tile lines shall be attached thereto to provide an adequate outlet for the disrupted adjacent tile lines.

D. **Re-establishing Subsurface Drainage Within Facility Footprint**

Following Deconstruction and using Best Efforts, if underground drainage tile lines were present within the footprint of the facility and were severed or otherwise damaged during original Construction, facility operation, and/or facility Deconstruction, the Facility Owner shall repair existing drainage tiles or install new drainage tile lines of comparable quality and cost to the original, within the footprint of the Facility with sufficient capacity to restore the underground drainage capacity that existed within the footprint of the Facility prior to Construction. Such installation shall be completed within 12 months after the end of the useful life of the Facility and shall be compliant with Figures 1 and 2 to this Agreement or based on prudent industry standards if agreed to by Landowner.

E. If there is any dispute between the Landowner and the Facility Owner on the method of permanent drainage tile line repair, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

F. During Deconstruction, all additional permanent drainage tile line repairs beyond those included above in Section 6.D. must be made within 30 days of identification or notification of the damage, weather and soil conditions permitting. At other times, such repairs must be made at a time mutually agreed upon by the Facility Owner and the Landowner. If the Facility Owner and Landowner cannot agree upon a reasonable method to complete this restoration, the Facility Owner may implement the recommendations of the appropriate County SWCD and such implementation constitutes compliance with this provision.

G. Following completion of the work required pursuant to this Section, the Facility Owner shall be responsible for correcting all drainage tile line repairs that fail due to Construction and/or Deconstruction for one year following the completion of Construction or Deconstruction, provided those repairs were made by the Facility Owner. The Facility Owner shall not be responsible for drainage tile repairs that the Facility Owner pays the Landowner to perform.

7. Rock Removal

With any excavations, the following rock removal procedures pertain only to rocks found in the uppermost 42 inches of soil, the common freeze zone in Illinois, which emerged or were brought to the site as a result of Construction and/or Deconstruction.

A. Before replacing any topsoil, Best Efforts shall be taken to remove all rocks greater than 3 inches in any dimension from the surface of exposed subsoil which emerged or were brought to the site as a result of Construction and/or Deconstruction.

B. If trenching, blasting, or boring operations are required through rocky terrain, precautions shall be taken to minimize the potential for oversized rocks to become interspersed in adjacent soil material.

C. Rocks and soil containing rocks removed from the subsoil areas, topsoil, or from any excavations, shall be removed from the Landowner's premises or disposed of on the Landowner's premises at a location that is mutually acceptable to the Landowner and the Facility Owner.

8. Repair of Compaction and Rutting

A. Unless the Landowner opts to do the restoration work on compaction and rutting, after the topsoil has been replaced post-Deconstruction, all areas within the boundaries of the Facility that were traversed by vehicles and Construction and/or Deconstruction equipment that exhibit compaction and rutting shall be restored by the Facility Owner. All prior Cropland shall be ripped at least 18 inches deep or to the extent practicable, and all pasture and woodland shall be ripped at least 12 inches deep or to the extent practicable. The existence of drainage tile lines or underground utilities may necessitate less ripping depth. The disturbed area shall then be disked.

B. All ripping and disking shall be done at a time when the soil is dry enough for normal tillage operations to occur on Cropland adjacent to the Facility.

C. The Facility Owner shall restore all rutted land to a condition as close as possible to its original condition upon Deconstruction, unless necessary earlier as determined by the Landowner.

D. If there is any dispute between the Landowner and the Facility Owner as to what areas need to be ripped/disked or the depth at which compacted areas should be ripped/disked, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

9. Construction During Wet Weather

Except as provided below, construction activities are not allowed on agricultural land during times when normal farming operations, such as plowing, disking, planting or harvesting, cannot take place due to excessively wet soils. With input from the landowner, wet weather conditions may be determined on a field by field basis.

A. Construction activities on prepared surfaces, surfaces where topsoil and subsoil have been removed, heavily compacted in preparation, or otherwise stabilized (e.g. through cement mixing) may occur at the discretion of the Facility Owner in wet weather conditions.

B. Construction activities on unprepared surfaces will be done only when work will not result in rutting which may mix subsoil and topsoil. Determination as to the potential of subsoil and topsoil mixing will be made in consultation with the underlying Landowner, or, if approved by the Landowner, his/her designated tenant or designee.

10. Prevention of Soil Erosion

A. The Facility Owner shall work with Landowners and create and follow a SWPPP to prevent excessive erosion on land that has been disturbed by Construction or Deconstruction of a Facility.

B. If the Landowner and Facility Owner cannot agree upon a reasonable method to control erosion on the Landowner's property, the Facility Owner shall consider the recommendations of the appropriate County SWCD to resolve the disagreement.

C. The Facility Owner may, per the requirements of the project SWPPP and in consultation with the Landowner, seed appropriate vegetation around all panels and other facility components to prevent erosion. The Facility Owner must utilize Best Efforts to ensure that all seed mixes will be as free of any noxious weed seeds as possible. The Facility Owner shall consult with the Landowner regarding appropriate varieties to seed.

11. Repair of Damaged Soil Conservation Practices

Consultation with the appropriate County SWCD by the Facility Owner shall be carried out to determine if there are soil conservation practices (such as terraces, grassed waterways, etc.) that will be damaged by the Construction and/or Deconstruction of the Facility. Those conservation practices shall be restored to their preconstruction condition as close as reasonably practicable following Deconstruction in accordance with USDA NRCS technical standards. All repair costs shall be the responsibility of the Facility Owner.

12. Compensation for Damages to Private Property

The Facility Owner shall reasonably compensate Landowners for damages caused by the Facility Owner. Damage to Agricultural Land shall be reimbursed to the Landowner as prescribed in the applicable Underlying Agreement.

13. Clearing of Trees and Brush

A. If trees are to be removed for the Construction or Deconstruction of a Facility, the Facility Owner shall consult with the Landowner to determine if there are trees of commercial or other value to the Landowner.

B. If there are trees of commercial or other value to the Landowner, the Facility Owner shall allow the Landowner the right to retain ownership of the trees to be removed and the disposition of the removed trees shall be negotiated prior to the commencement of land clearing.

14. Access Roads

A. To the extent practicable, access roads shall be designed to not impede surface drainage and shall be built to minimize soil erosion on or near the access roads.

B. Access roads may be left intact during Construction, operation or Deconstruction through mutual agreement of the Landowner and the Facility Owner unless otherwise restricted by federal, state, or local regulations.

C. If the access roads are removed, Best Efforts shall be expended to assure that the land shall be restored to equivalent condition(s) as existed prior to their construction, or as otherwise agreed to by the Facility Owner and the Landowner. All access roads that are removed shall be ripped to a depth of 18 inches. All ripping shall be performed consistent with Section 8.

15. Weed/Vegetation Control

A. The Facility Owner shall provide for weed control in a manner that prevents the spread of weeds. Chemical control, if used, shall be done by an appropriately licensed pesticide applicator.

B. The Facility Owner shall be responsible for the reimbursement of all reasonable costs incurred by owners of agricultural land where it has been determined by the appropriate state or county entity that weeds have spread from the Facility to their property. Reimbursement is contingent upon written notice to the Facility Owner. Facility Owner shall reimburse the property owner within 45 days after notice is received.

C. The Facility Owner shall ensure that all vegetation growing within the perimeter of the Facility is properly and appropriately maintained. Maintenance may include, but not be limited to, mowing, trimming, chemical control, or the use of livestock as agreed to by the Landowner.

D. The Deconstruction plans must include provisions for the removal of all weed control equipment used in the Facility, including weed-control fabrics or other ground covers.

16. Indemnification of Landowners

The Facility Owner shall indemnify all Landowners, their heirs, successors, legal representatives, and assigns from and against all claims, injuries, suits, damages, costs, losses, and reasonable expenses resulting from or arising out of the Commercial Solar Energy Facility, including Construction and Deconstruction thereof, and also including damage to such Facility or any of its appurtenances, except where claims, injuries, suits, damages, costs, losses, and expenses are caused by the negligence or intentional acts, or willful omissions of such Landowners, and/or the Landowners heirs, successors, legal representatives, and assigns.

17. Deconstruction Plans and Financial Assurance of Commercial Solar Energy Facilities

A. Deconstruction of a Facility shall include the removal/disposition of all solar related equipment/facilities, including the following utilized for operation of the Facility and located on Landowner property:

1. Solar panels, cells and modules;
2. Solar panel mounts and racking, including any helical piles, ground screws, ballasts, or other anchoring systems;
3. Solar panel foundations, if used (to depth of 5 feet);

4. Transformers, inverters, energy storage facilities, or substations, including all components and foundations; however, Underground Cables at a depth of 5 feet or greater may be left in place;

5. Overhead collection system components;

6. Operations/maintenance buildings, spare parts buildings and substation/switching gear buildings unless otherwise agreed to by the Landowner;

7. Access Road(s) unless Landowner requests in writing that the access road is to remain;

8. Operation/maintenance yard/staging area unless otherwise agreed to by the Landowner; and

9. Debris and litter generated by Deconstruction and Deconstruction crews.

B. The Facility Owner shall, at its expense, complete Deconstruction of a Facility within twelve (12) months after the end of the useful life of the Facility.

C. During the County permit process, or if none, then prior to the commencement of construction, the Facility Owner shall file with the County a Deconstruction Plan. The Facility Owner shall file an updated Deconstruction Plan with the County on or before the end of the tenth year of commercial operation.

D. The Facility Owner shall provide the County with Financial Assurance to cover the estimated costs of Deconstruction of the Facility. Provision of this Financial Assurance shall be phased in over the first 11 years of the Project's operation as follows:

1. On or before the first anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.

2. On or before the sixth anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.

3. On or before the eleventh anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the Facility as determined in the updated Deconstruction Plan provided during the tenth year of commercial operation.

The Financial Assurance shall not release the surety from liability until the Financial Assurance is replaced. The salvage value of the Facility may only be used to reduce the estimated costs of Deconstruction if the County agrees that all interests in the salvage value are subordinate or have been subordinated to that of the County if Abandonment occurs.

E. The County may, but is not required to, reevaluate the estimated costs of Deconstruction of any Facility after the tenth anniversary, and every five years thereafter, of the Commercial Operation Date. Based on any reevaluation, the County may require changes in the level of Financial Assurance used to calculate the phased Financial Assurance levels described in Section 17.D. required from the Facility Owner. If the County is unable to its satisfaction to perform the investigations necessary to approve the Deconstruction Plan filed by the Facility Owner, then the County and Facility may mutually agree on the selection of a Professional Engineer independent of the Facility Owner to conduct any necessary investigations. The Facility Owner shall be responsible for the cost of any such investigations.

F. Upon Abandonment, the County may take all appropriate actions for Deconstruction including drawing upon the Financial Assurance.

Concurrence of the Parties to this AIMA

The Illinois Department of Agriculture and Atticus Solar, LLC concur that this AIMA is the complete AIMA governing the mitigation of agricultural impacts that may result from the Construction and Deconstruction of the solar farm project in Montgomery County within the State of Illinois.

The effective date of this AIMA commences on the date of execution.

STATE OF ILLINOIS
DEPARTMENT OF AGRICULTURE

Jerry Costello II

By: Jerry Costello II, Director 4

Clay Nordsiek

By Clay Nordsiek, Deputy General Counsel

801 E. Sangamon Avenue,
State Fairgrounds, POB 19281
Springfield, IL 62794-9281

1/29, 2025

Atticus Solar, LLC

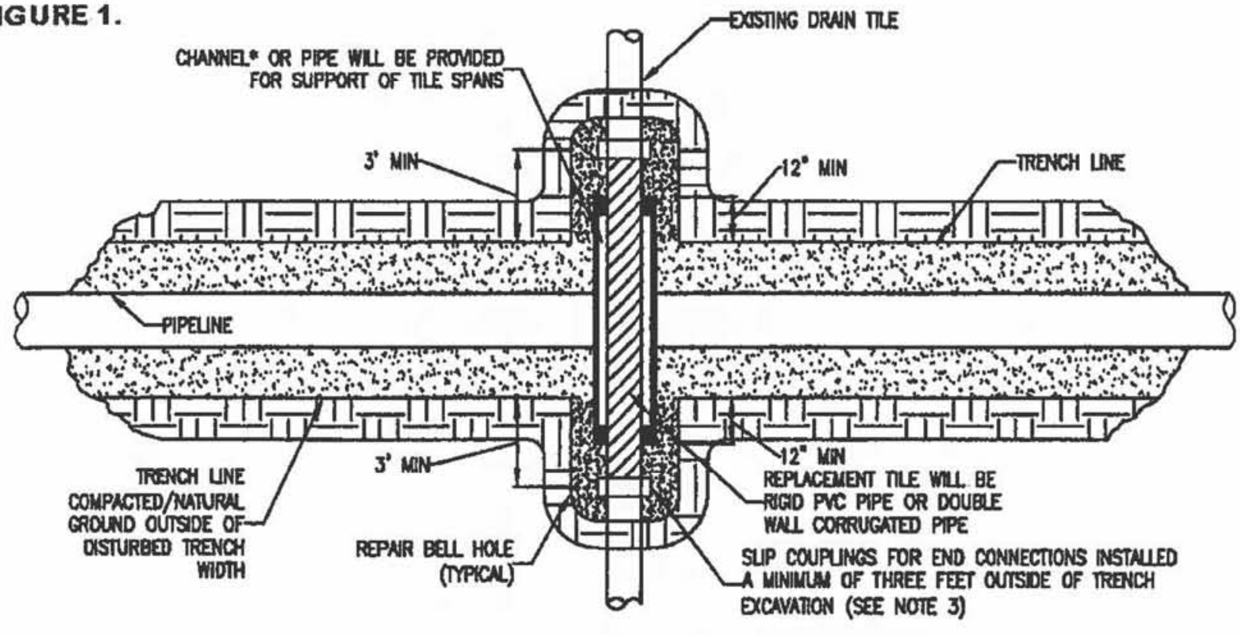
By Adrian Ortlieb

910 Haring St.
Lafayette, LA 70503

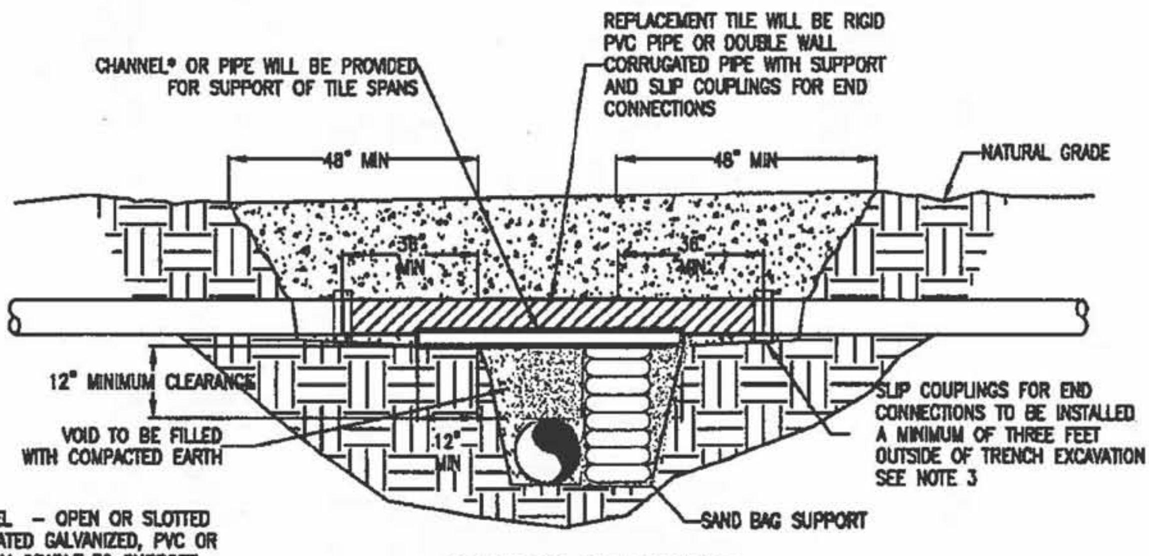
Address

January 13th, 2025

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

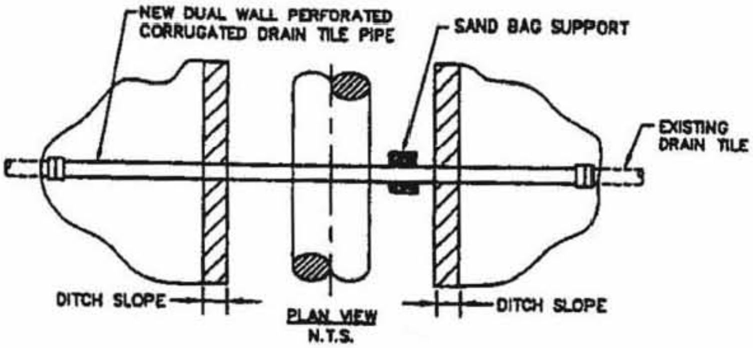
CROSS SECTION
N.T.S.

NOTE:

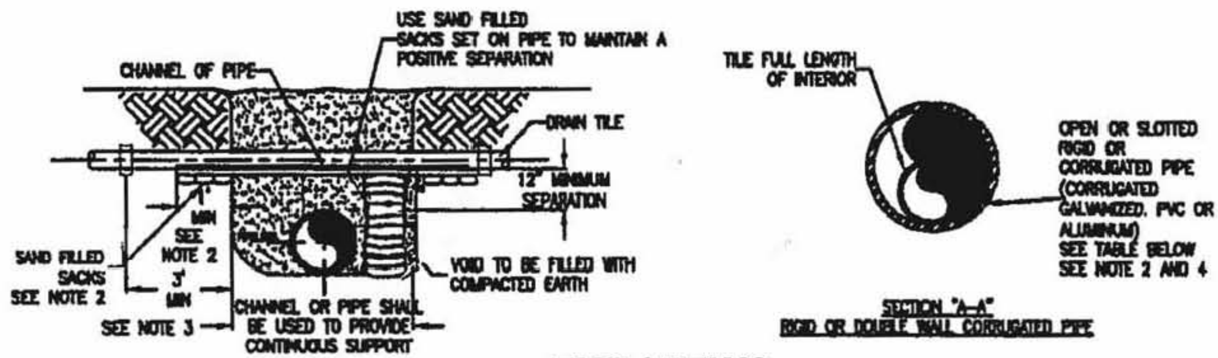
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW



END VIEWS

MINIMUM SUPPORT TABLE				
TILE SIZE	CHANNEL SIZE		PIPE SIZE	
3"	4" @ 5.4	#/FT	4"	STD. WT.
4"-5"	5" @ 6.7	#/FT	6"	STD. WT.
8"-9"	7" @ 9.8	#/FT	9"-10"	STD. WT.
10"	10" @ 15.3	#/FT	12"	STD. WT.

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.

2. 1'-0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).

3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.

4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.

5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.

6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.

7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

Illinois Department of Agriculture

JB Pritzker, Governor
Jerry Costello II, Director

Bureau of Land and Water Resources
State Fairgrounds • P.O. Box 19281 • Springfield, IL 62794-9281 • 217/782-6297 • TDD 866/287-2999 • Fax 217/557-0993

January 29, 2025

Dear Landowner:

As the landowner across which the Atticus Solar, LLC is planning to construct a community scale solar farm and related ±5 MW Commercial Solar Energy Facility, that will consist of solar panel arrays, racking systems, access roads, an onsite underground collection system, inverters and transformers, the Illinois Department of Agriculture would like to inform you of the following matter.

Effective January 29, 2025, Atticus Solar, LLC and the Illinois Department of Agriculture (IDOA) entered into an Agricultural Impact Mitigation Agreement (AIMA) establishing standards and policies that Atticus Solar, LLC will follow as it constructs a ±5 MW community scale commercial Solar Energy Facility over agricultural land in Montgomery County. The enclosed AIMA will provide a high level of protection to such land, but it may not address specific concerns that you may have. Such concerns must be addressed individually in your own easement contract to accomplish your specific goals.

As you review the AIMA, you may identify procedures that you would like to change. Your right to negotiate changes is preserved by Paragraph B. on page one of the AIMA. It states, "Except for Section 17B. through F., all actions set forth in this AIMA are subject to modification through negotiation by Landowners and the Facility Owner, provided such changes are negotiated in advance of the respective Construction or Deconstruction activities." It is your decision as to whether you discuss the changes you desire with the right-of-way agent that is assigned to you. Of course, you also have the option to seek your own attorney to make sure your interests are protected.

As you consider your personal interests, you may want to include the owner indemnification clause in your individual easement agreement to protect yourself, your family and future heirs against future claims or expenses arising from the commercial solar energy facility's construction, repairs and maintenance. This item is covered in Section 16 of the AIMA. We feel it is best that such issues are left to landowners to address in their individual easement contracts if specific items are of concern.

Please note that although the IDOA has entered the AIMA with the Atticus Solar, LLC it does not constitute our endorsement of the project. The AIMA's sole purpose is to provide a high level of protection to landowners and agricultural land that will be impacted by the construction of the Solar Farm.

If you have questions, feel free to contact Jeffrey Evers of my staff at 217-785-5594, the address listed above or agr.aima@illinois.gov.

Sincerely,

Michelle Curby

Michelle Curby, Chief
Bureau of Land and Water Resources

Enclosure
MC:JE

cc: Jerry Costello II, IDOA Director
Clay Nordsiek, IDOA
Bill Bodine, Laura Harmon - IL Farm Bureau
Garrett W. Thalgott – IL Farm Bureau
Montgomery Co. Farm Bureau Manager
Montgomery Co. Soil and Water Conservation District (SWCD)
Regional Representatives

Exhibit F: Illinois Department of Natural Resources (IDNR) EcoCAT

Eco CAT
Ecological Compliance Assessment Tool

Applicant:	Atticus Solar, LLC	*IDNR Project Number:*	2509010
Contact:	Keith Morel	*Date:*	01/31/2025
Address:	910 Harding St. Lafayette, LA 70503		
Project:	Atticus Solar, LLC		
Address:	County Rd 1125 E , Hillsboro		

Description: Community Solar Farm

Natural Resource Review Results

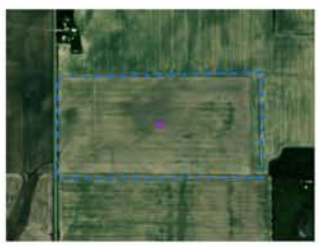
Consultation for Endangered Species Protection and Natural Areas Preservation (Part 1075)

The Illinois Natural Heritage Database contains no record of State-listed threatened or endangered species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves in the vicinity of the project location.

Consultation is terminated. This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary. Termination does not imply IDNR's authorization or endorsement.

Location

The applicant is responsible for the accuracy of the location submitted for the project.



County: Montgomery

Township, Range, Section:
8N, 4W, 36

IL Department of Natural Resources Contact
Adam Rawe
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
Montgomery County, IL - County Board
Mike Plunkett-
#1 Courthouse Square
Room 202
Hillsboro, Illinois 62049

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

By using this website, you acknowledge that you have read and agree to these terms. These terms may be revised by IDNR as necessary. If you continue to use the EcoCAT application after we post changes to these terms, it will mean that you accept such changes. If at any time you do not accept the Terms of Use, you may not continue to use the website.

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

Security

EcoCAT operates on a state of Illinois computer system. We may use software to monitor traffic and to identify unauthorized attempts to upload, download, or change information, to cause harm or otherwise to damage this site. Unauthorized attempts to upload, download, or change information on this server is strictly prohibited by law.

Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

Eco CAT
Ecological Compliance Assessment Tool

EcoCAT Receipt

Project Code 2509010

APPLICANT	DATE
Atticus Solar, LLC Keith Morel 910 Harding St. Lafayette, LA 70503	1/31/2025

DESCRIPTION	FEE	CONVENIENCE FEE	TOTAL PAID
EcoCAT Consultation	$ 125.00	$ 2.81	$ 127.81

TOTAL PAID $ 127.81

Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702
217-785-5500
dnr.ecocat@illinois.gov

IRONWOOD RENEWABLES

Exhibit G: Ecosphere Information for Planning and Consultation (IPaC)

NO EFFECT DETERMINATION MEMORANDUM

Project Name: Atticus Solar, LLC

Project Code: 2025-0055650

Location: Montgomery County, Illinois

Date: April 23, 2025

Prepared By: Hamilton Carrier, Ironwood Renewables

Contact: hcarrier@ironwoodenergy.com | (337) 344-7381

1. Project Description

The proposed action is a community solar project involving land classified as cultivated cropland and previously developed areas. The project will not disturb any natural or semi-natural vegetation, nor will it impact transportation infrastructure or structures known to host bat populations.

2. Consultation Summary

Per Section 7 of the Endangered Species Act (ESA), federal agencies or designated non-federal representatives are responsible for evaluating the effects of their actions on federally listed species and critical habitats. Consultation is only required when an action may affect listed species or habitats.

As required under 50 CFR 402.12(e), a species list for the project area was generated via the USFWS Information for Planning and Consultation (IPaC) system on April 22, 2025. The list identified the following species:

- Indiana Bat (Myotis sodalis) – Endangered
- Whooping Crane (Grus americana) – Experimental, Non-Essential Population
- Monarch Butterfly (Danaus plexippus) – Proposed Threatened

Critical Habitat: There are no designated critical habitats within the project area under the jurisdiction of the USFWS Southern Illinois Sub-Office.

3. Basis for “No Effect” Determination

The action area consists primarily of developed lands and cultivated croplands. While some wetlands are present, they are limited in extent and do not represent high-quality habitat for listed species. No suitable roosting or foraging habitat for Indiana bats (e.g., mature forested areas or known roost trees) exists in the action area. Although formal assessments have not been conducted, the site does not currently support high-quality prairie, grassland, or other features typically used as stopover habitat by Monarch butterflies or Whooping Cranes. However, the project includes the establishment of native pollinator plantings, which may enhance the area’s ecological value over time. There is no surface or groundwater alteration expected to impact sensitive habitat areas. No listed species are expected to be present or exposed to any project-related stressors. Therefore, based on best available information and consistent with USFWS guidance, the proposed action is anticipated to have no effect on federally listed species or designated critical habitat.

4. Supporting Documents

- IPaC Official Species List (dated April 22, 2025)
- USFWS Midwest Region “No Effect” Determination Guidance
- Project Site Map & Description

5. Conclusion

This memo documents that the Atticus Solar, LLC community solar project will result in no effect to federally listed species or designated critical habitats. No further consultation under Section 7 of the ESA is required. This determination should be retained in the project file and made available upon request.

S7 Consultation Technical Assistance

Additional Guidance for "No Effect" Determinations

'No Effect' Determinations

This webpage is intended to help identify 'no effect' projects in U.S. Fish and Wildlife Service's (Service) Midwest Region – that is, projects that will not affect (1) species listed under the Endangered Species Act as threatened or endangered (listed species) or (2) critical habitat.

Section 7 consultation is only required for actions that may affect a listed species or critical habitat. A common way in which projects warrant a 'No Effect' determination is when they will not affect any area where a listed species occurs or any area that has been designated as critical habitat.

Determination Keys

Before using this guidance, check to see whether there is a determination key in IPaC that may provide you with an automated section 7 determination for your project. Determination keys are available for use in multiple states and species in the Service's Midwest Region. They provide a more comprehensive guide for assessing the effects of projects than this guidance and also facilitate administrative record keeping for the action agency or applicant.

Important – Consider the Entire "Action Area" not Just the Project Footprint

Be sure to assess potential effects to the entire action area and not just the immediate area involved in the action. Effects to surface water or groundwater, for example, often extend outside of a project's immediate footprint. The same is true for actions that may cause drift of airborne particles or chemicals into nearby areas or when noise or artificial light is projected to areas outside of the immediate project footprint where they may act as stressors for some species or critical habitats.

Special Considerations

Rights-of-way

Be careful when assessing actions that affect rights-of-way, which often contain natural or semi-natural vegetation despite periodic mowing or other management. Some endangered and threatened species inhabit rights-of-way and could be affected by regular maintenance activities or construction.

Communication Towers and Migratory Birds

If your action involves a communication tower, to reduce the potential for your project to harm migratory birds – including listed species – please read and follow the Service's **Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning**.

If your tower does not meet the proper lighting, siting, and construction guidelines, it could pose a risk of collision for migratory birds. If any bird species are on your IPaC species list, and your project involves a communication tower **do not** make a no effect determination without first coordinating with your local field office.[1]

[1] Try searching in your web browser for "*usfws ecological services field office [state_name]*."

Steps for Reviewing Actions for 'No Effects'

Step 1 – Does the action area include only already developed areas or cultivated cropland[2]? Already developed areas are already graveled, paved, covered by structures or lawns, and devoid of natural or semi-natural vegetation. Projects that affect only cultivated cropland are also unlikely to affect listed species or critical habitats in USFWS' Midwest Region.

Notes:

1) Listed bats sometimes occur in buildings. If the action will affect a building that contains bats, answer 'No' and coordinate with the Service's field office.
2) Do not consider a waterbody as an "already developed area" unless its bottom consists entirely of hard artificial substrates (e.g., concrete).

Yes: Go to Step 2.

No: Go to Step 2.D. of the S7 Technical Assistance webpage.

Step 2 – Does the project involve effects to transportation infrastructure, such as roads, bridges, or culverts?

Yes – Look in IPaC to see if any determination keys may apply to your project; or, coordinate with the local USFWS Ecological Services field office.

No – For projects that affect only already developed areas or cultivated cropland and do not involve effects to transportation infrastructure or buildings that contain bats, refer to 'No Effect' Determination and Documentation, below.

'No Effect' Determination and Documentation

Based on your response above, you have determined that your proposed project will affect only already developed areas or cultivated cropland, does not involve effects to natural or semi-natural vegetation, does not affect a building that contains bats, and does not affect transportation infrastructure.

To document your section 7 review and "no effect" determination, we recommend that you fill-in the information below, attach your species list from IPaC, and file in your project record.

Project Name: Atticus Solar, LLC

Date: April 23, 2025

Comments for your record:

[2] Projects that affect only cultivated cropland, with no additional effects to nearby natural areas – from pesticide drift, surface runoff, effects to groundwater, etc. – would not be expected to affect listed species or critical habitats in USFWS' Midwest Region.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Southern Illinois Sub-Office
Southern Illinois Sub-office
8588 Route 148
Marion, IL 62959-5822
Phone: (618) 998-5945
Email Address: Marion@fws.gov
https://www.fws.gov/office/illinois-iowa-ecological-services

In Reply Refer To: 04/22/2025 16:50:04 UTC
Project Code: 2025-0055650
Project Name: Atticus Solar, LLC

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 attached species list identifies federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat, if present, within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation. If you determine that other federally protected species not listed in this Official Species List are present in your action area, you are still responsible to analyze your potential effects to those species and consult with the U.S. Fish and Wildlife Service if consultation is required.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) **the accuracy of this species list should be verified after 90 days**. This verification can be completed formally or informally. You may verify the list by visiting the Information for Planning and Consultation (IPaC) website https://ipac.ecosphere.fws.gov at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

Section 7 Consultation

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the U.S. Fish and Wildlife Service

(Service) if they determine their project “may affect” listed species or designated critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action may affect endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service to make "no effect" determinations. If you determine that your proposed action will have no effect on threatened or endangered species or their respective designated critical habitat, you do not need to seek concurrence with the Service.

Note: For some species or projects, IPaC will present you with *Determination Keys*. You may be able to use one or more Determination Keys to conclude consultation on your action for species covered by those keys.

Technical Assistance for Listed Species

1. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain information on the species life history, species status, current range, and other documents by selecting the species from the thumbnails or list view and visiting the species profile page.???????

No Effect Determinations for Listed Species

1. If there are *no* species or designated critical habitats on the Endangered Species portion of the species list: conclude "no species and no critical habitat present" and document your finding in your project records. No consultation under ESA section 7(a)(2) is required if the action would result in no effects to listed species or critical habitat. Maintain a copy of this letter and IPaC official species list for your records.
2. If any species or designated critical habitat are listed as potentially present in the **action area** of the proposed project the project proponents are responsible for determining if the proposed action will have “no effect” on any federally listed species or critical habitat. No effect, with respect to species, means that no individuals of a species will be exposed to any consequence of a federal action or that they will not respond to such exposure.
3. If the species habitat is not present within the action area or current data (surveys) for the species in the action area are negative: conclude “no species habitat or species present” and document your finding in your project records. For example, if the project area is located entirely within a “developed area” (an area that is already graveled/paved or supports structures and the only vegetation is limited to frequently mowed grass or conventional landscaping, is located within an existing maintained facility yard, or is in cultivated cropland conclude no species habitat present. Be careful when assessing actions that affect: 1) rights-of-ways that contains natural or semi-natural vegetation despite periodic mowing or other management; structures that have been known to support listed species (example: bridges), and 2) surface water or groundwater. Several species inhabit rights-of-ways, and you should carefully consider effects to surface water or groundwater, which often extend outside of a project’s immediate footprint.
4. Adequacy of Information & Surveys - Agencies may base their determinations on the best evidence that is available or can be developed during consultation. Agencies must give the benefit of any doubt to the species when there are any inadequacies in the information. Inadequacies may include uncertainty in any step of the analysis. To provide adequate information on which to base a determination, it may be appropriate to conduct surveys to determine whether listed species or their habitats are present in the action area. Please contact our office for more information or see the survey guidelines that the Service has made available in IPaC.

May Effect Determinations for Listed Species

1. If the species habitat is present within the action area and survey data is unavailable or inconclusive: assume the species is present or plan and implement surveys and interpret results in coordination with our office. If assuming species present or surveys for the species are positive continue with the may affect determination process. May affect, with respect to a species, is the appropriate conclusion when a species might be exposed to a consequence of a federal action and could respond to that exposure. For critical habitat, 'may affect' is the appropriate conclusion if the action area overlaps with mapped areas of critical habitat and an essential physical or biological feature may be exposed to a consequence of a federal action and could change in response to that exposure.
2. Identify stressors or effects to the species and to the essential physical and biological features of critical habitat that overlaps with the action area. Consider all consequences of the action and assess the potential for each life stage of the species that occurs in the action area to be exposed to the stressors. Deconstruct the action into its component parts to be sure that you do not miss any part of the action that could cause effects to the species or physical and biological features of critical habitat. Stressors that affect species' resources may have consequences even if the species is not present when the project is implemented.
3. If no listed or proposed species will be exposed to stressors caused by the action, a 'no effect' determination may be appropriate – be sure to separately assess effects to critical habitat, if any overlaps with the action area. If you determined that the proposed action or other activities that are caused by the proposed action may affect a species or critical habitat, the next step is to describe the manner in which they will respond or be altered. Specifically, to assess whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected."
4. Determine how the habitat or the resource will respond to the proposed action (for example, changes in habitat quality, quantity, availability, or distribution), and assess how the species is expected to respond to the effects to its habitat or other resources. Critical habitat analyses focus on how the proposed action will affect the physical and biological features of the critical habitat in the action area. If there will be only beneficial effects or the effects of the action are expected to be insignificant or discountable, conclude "may affect, not likely to adversely affect" and submit your finding and supporting rationale to our office and request concurrence.
5. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, check IPaC for species-specific Section 7 guidance and conservation measures to determine whether there are any measures that may be implemented to avoid or minimize the negative effects. If you modify your proposed action to include conservation measures, assess how inclusion of those measures will likely change the effects of the action. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, contact our office for assistance.
6. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For additional information on completing Section 7 Consultation including a Glossary of Terms used in the Section 7 Process, information requirements for completing Section 7, and example letters visit the Midwest Region Section 7 Consultations website at: https://www.fws.gov/library/collections/midwest-region-section-7-consultations.

https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance

You may find more specific information on completing Section 7 on communication towers and transmission lines on the following websites:

- Incidental Take Beneficial Practices: Power Lines - https://www.fws.gov/story/incidental-take-beneficial-practices-power-lines
- Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning. - https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation

Tricolored Bat Update

On September 14, 2022, the Service published a proposal in the Federal Register to list the tricolored bat (Perimyotis subflavus) as endangered under the Endangered Species Act (ESA). The Service has up to 12-months from the date the proposal published to make a final determination, either to list the tricolored bat under the Act or to withdraw the proposal. The Service determined the bat faces extinction primarily due to the rangewide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across North America. Because tricolored bat populations have been greatly reduced due to WNS, surviving bat populations are now more vulnerable to other stressors such as human disturbance and habitat loss. Species proposed for listing are not afforded protection under the ESA; however, as soon as a listing becomes effective (typically 30 days after publication of the final rule in the Federal Register), the prohibitions against jeopardizing its continued existence and "take" will apply. Therefore, if your future or existing project has the potential to adversely affect tricolored bats after the potential new listing goes into effect, we recommend that the effects of the project on tricolored bat and their habitat be analyzed to determine whether authorization under ESA section 7 or 10 is necessary. Projects with an existing section 7 biological opinion may require reinitiation of consultation, and projects with an existing section 10 incidental take permit may require an amendment to provide uninterrupted authorization for covered activities. Contact our office for assistance.

Bald and Golden Eagles

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act, as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, please contact our office for further coordination. For more information on permits and other eagle information visit our website https://www.fws.gov/library/collections/bald-and-golden-eagle-management.

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

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:

Southern Illinois Sub-Office
Southern Illinois Sub-office
8588 Route 148
Marion, IL 62959-5822
(618) 998-5945

PROJECT SUMMARY

Project Code: 2025-0055650
Project Name: Atticus Solar, LLC
Project Type: Power Gen - Solar
Project Description: Community solar project
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.09168914999999,-89.48253696939,14z

Counties: Montgomery County, Illinois

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 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.

---

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
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

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

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

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.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Hamilton Carrier
Address: 910 Harding Street
City: Lafayette
State: LA
Zip: 70503
Email hcarrier@ironwoodenergy.com
Phone: 3373447381

IRONWOOD
RENEWABLES

Exhibit H: State Historic Preservation Office (SHPO) Submittal Confirmation

Gmail

Keith Morel <kmorel@ironwoodenergy.com>

Request for SHPO Review Determination Letter-Atticus Solar

2 messages

Keith Morel <kmorel@ironwoodenergy.com> Thu, Mar 13, 2025 at 8:25 AM
To: SHPO.Review@illinois.gov
Cc: Adrian Ortlieb <adrian.ortlieb@ironwoodenergy.com>, Tommy Hovis <thovis@ironwoodenergy.com>, Jimmy Supple <jsupple@ironwoodenergy.com>, Holden Harrell <hharrell@ironwoodenergy.com>, Jackson Stewart <jstewart@ironwoodenergy.com>, Sophia Roark <sroark@ironwoodenergy.com>, Claire Trahan <ctrahan@ironwoodenergy.com>

To Whom It May Concern,

We are requesting a SHPO review determination letter for the subject property located off of Illinois Route 127, at coordinates 39.091649, -89.482880 in Section 36 of Township 8 North, Range 4 West.

To assist in your review, we have provided the following documents:

- Cover Letter
- HARGIS Map
- Current Aerial of Project Area
- April 1998 Aerial of Project Area (Google Earth)
- Wetland Delineation with topo maps and on-ground photos

Please review these materials and let us know if any further information is needed for your determination.

Thank you,

--

IRONWOOD RENEWABLES

Keith Morel
Ironwood Renewables LLC
910 Harding St.
Lafayette, LA 70503
Cell: (504) 493-3714
Office: (337) 889-3940
Fax: (337) 534-4599

5 attachments

2025-03-13-Atticus SHPO Cover Letter.pdf
141K

April 1998 Aerial of Project Area (Atticus Solar).pdf
4268K

Atticus Solar Aerial.pdf
5899K

2025-03-03 Atticus Wetland Delineation Letter.pdf
7111K

2025-03-12 HARGIS Atticus Solar.pdf
7155K

Montgomery County
Hillsboro
IL-127, N of N 6th Ave
Section:36-Township:8N-Range:4W
IEPA
New Construction, Atticus Solar LLC

PLEASE REFER TO: SHPO LOG #002031325

SURVEY REQUEST

April 2, 2025

Keith Morel
Ironwood Renewables
910 Harding Street
Lafayette, LA 70503

The Illinois State Historic Preservation Office is required by the Illinois State Agency Historic Resources Preservation Act (20 ILCS 3420, as amended, 17 IAC 4180) (Act) to review all state funded, permitted, or licensed undertakings for their effect on cultural resources. We have received information indicating that the referenced project will, pursuant to that law, require comments from our office and our comments follow. Should you have any contrary information, please contact our office at the number below.

According to the information provided there is no federal involvement in your project. Be aware that the state law is less restrictive than the federal cultural resource laws concerning archaeology. Therefore, if your project will use federal loans or grants, need federal agency permits, or is on federal property then your project must be reviewed by us pursuant to the National Historic Preservation Act of 1966, as amended. Please notify us immediately if such is the case, as additional archaeological survey coverage beyond what is described below may be necessary.

Structures are annotated within the project area on plat maps published in 1874, 1902, and 1912. Accordingly, a Phase I archaeological **survey** to locate, identify, and record these archaeological resources, at a legal minimum pursuant to Section 6 of the Act, a will be **required**. Survey beyond these known sites is not *required*, but we are always open to reviewing the results of any additional due diligence survey coverage that may help prevent unanticipated discoveries during construction and potential construction delays. This decision is based upon our understanding that there has not been any large-scale disturbance of the ground surface (excluding agricultural activities) or major construction activity within the project area which would have destroyed existing cultural resources prior to your project. If the area has been disturbed, please contact our office with the appropriate written and/or photographic evidence. Our most recently updated list of archaeological consultants, maintained as a courtesy, is available on our website. A copy of our letter with the SHPO Log Number should be provided to the selected professional archaeological contractor to ensure that the survey results are connected to your project. If you have questions, please contact Jeff Kruchten, Principal Archaeologist, at 217/785-1279 or jeff.kruchten@illinois.gov.

We have found that no historic architectural properties will be affected within the one-quarter (0.25) mile visual area of potential effects. If you have questions about this, please contact Steve Dasovich, Cultural Resources Manager, at 217/782-7441 or steve.dasovich@illinois.gov.

Sincerely,

Carey L. Mayer

Carey L. Mayer, AIA
Deputy State Historic Preservation Officer

Exhibit I: Federal Aviation Agency (FAA) Notice of Criteria

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

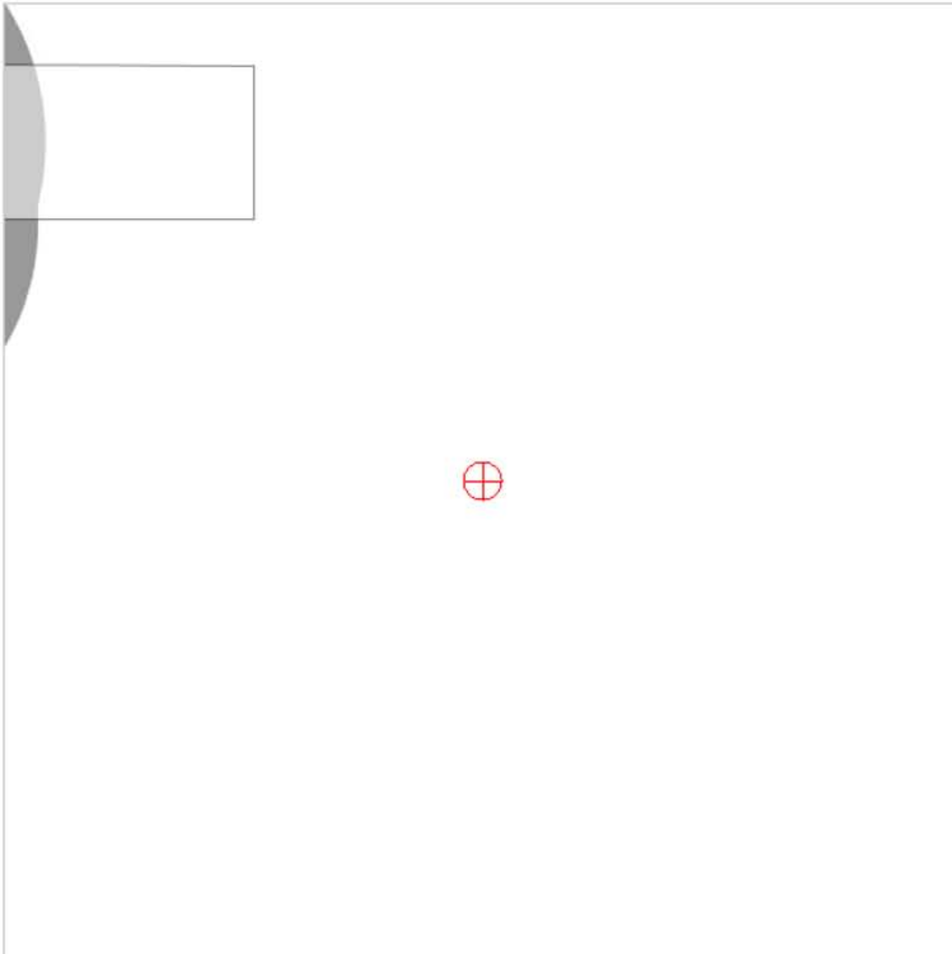
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

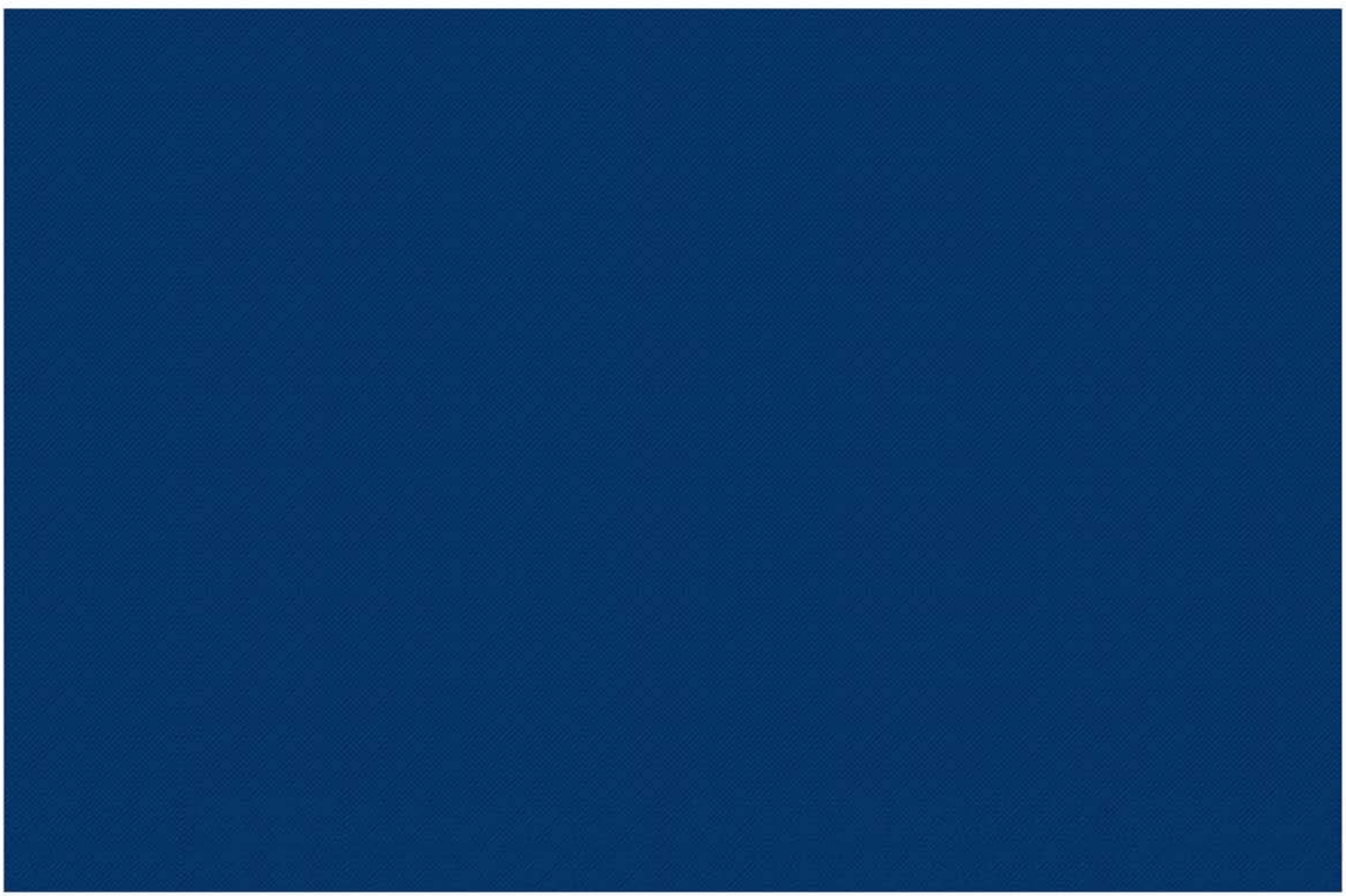
The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	SOLAR | Solar Panel Please select structure type and complete location point information.
Latitude:	39 Deg 5 M 36.41 S N
Longitude:	89 Deg 28 M 40.28 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	618 (nearest foot)
Structure Height :	20 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.





Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

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- your structure will exceed 200ft above ground level
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- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

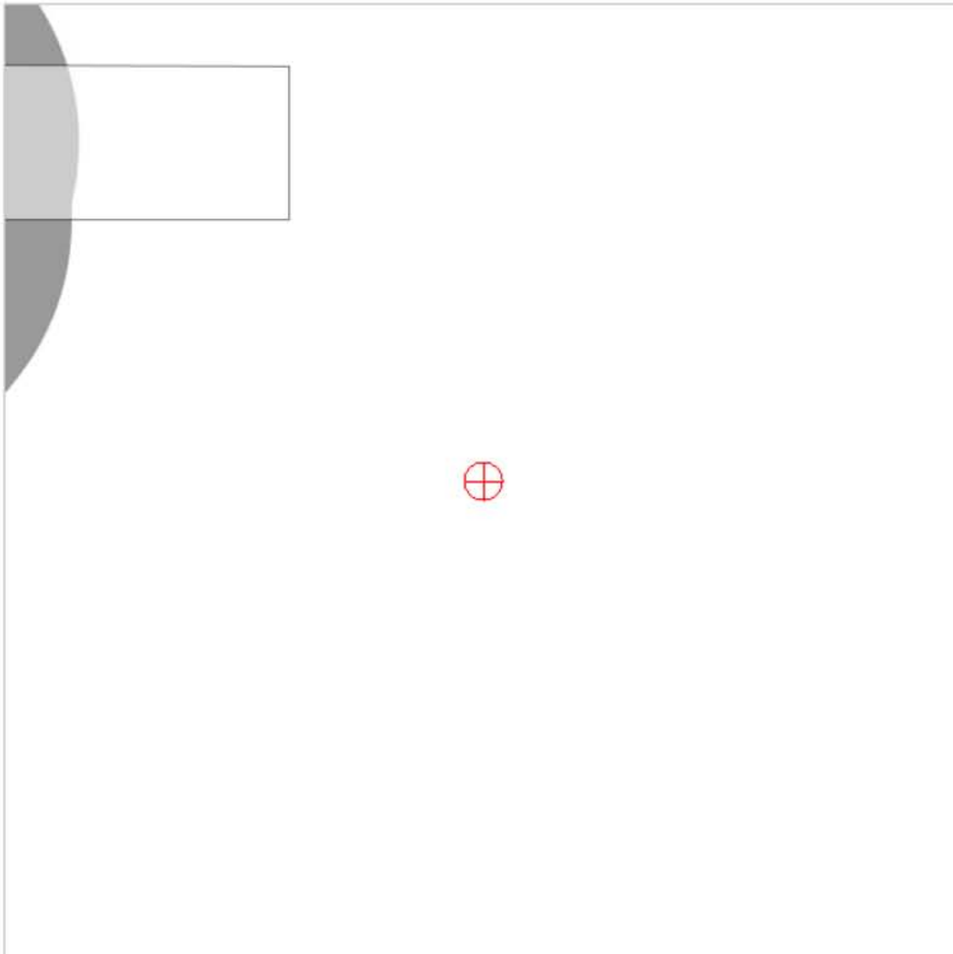
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

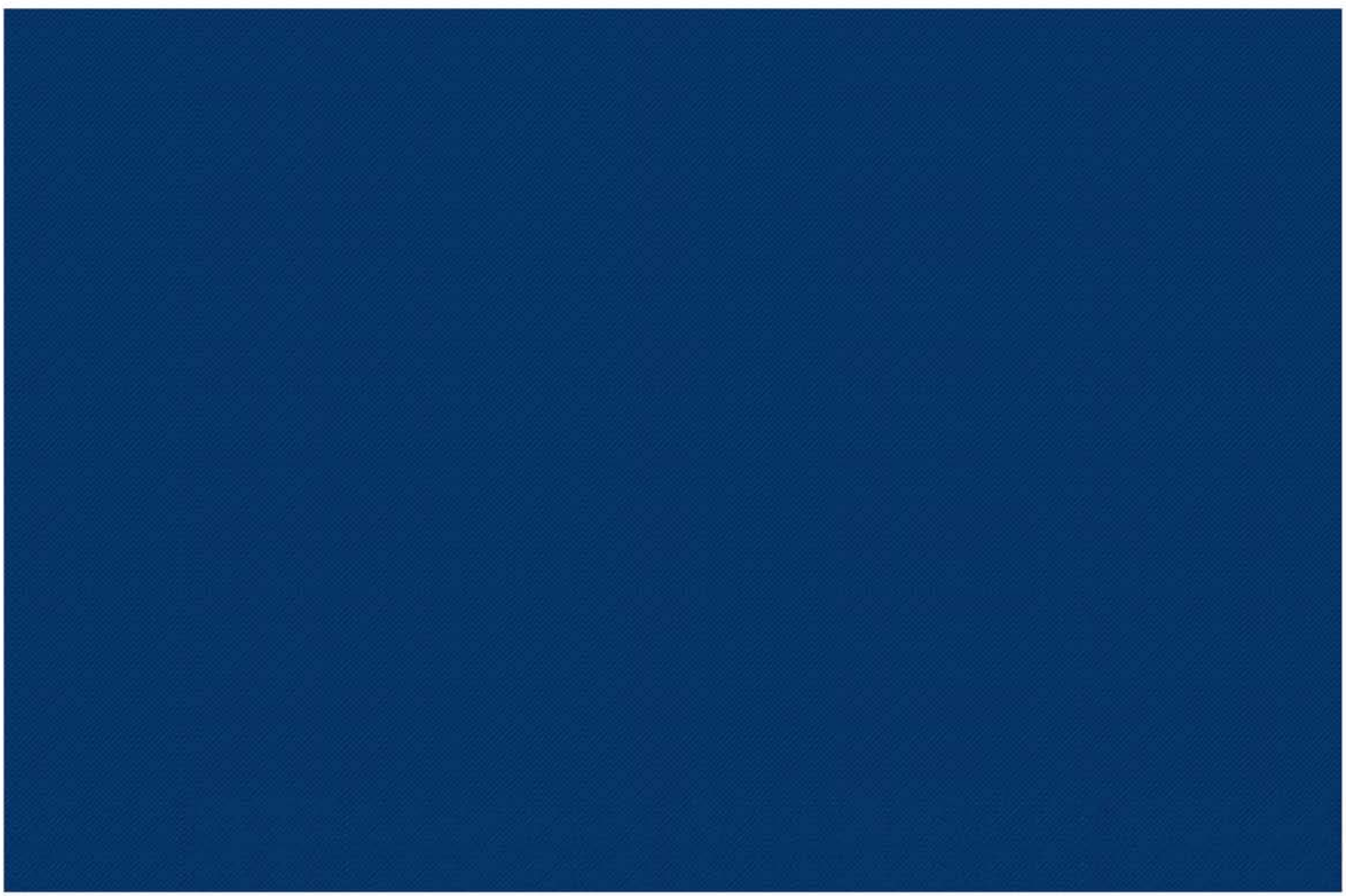
The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	SOLAR | Solar Panel Please select structure type and complete location point information.
Latitude:	39 Deg 5 M 36.46 S N
Longitude:	89 Deg 29 M 13.34 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	618 (nearest foot)
Structure Height :	20 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.





Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

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- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

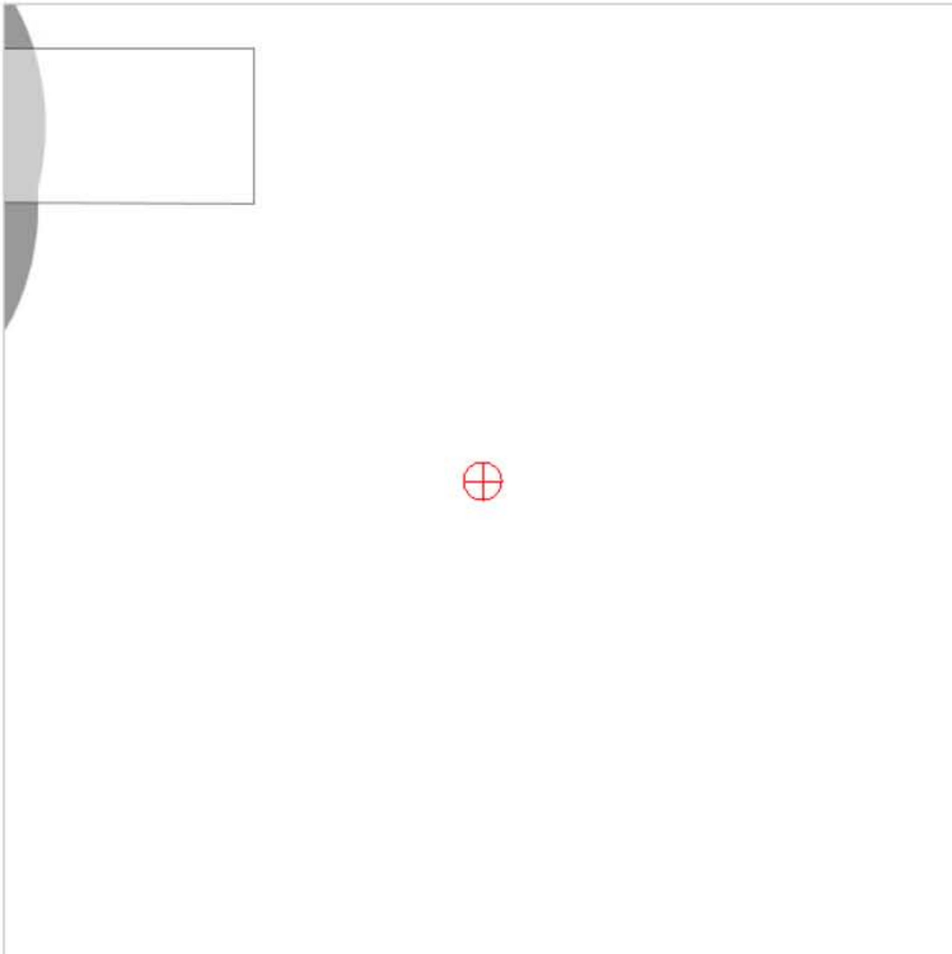
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

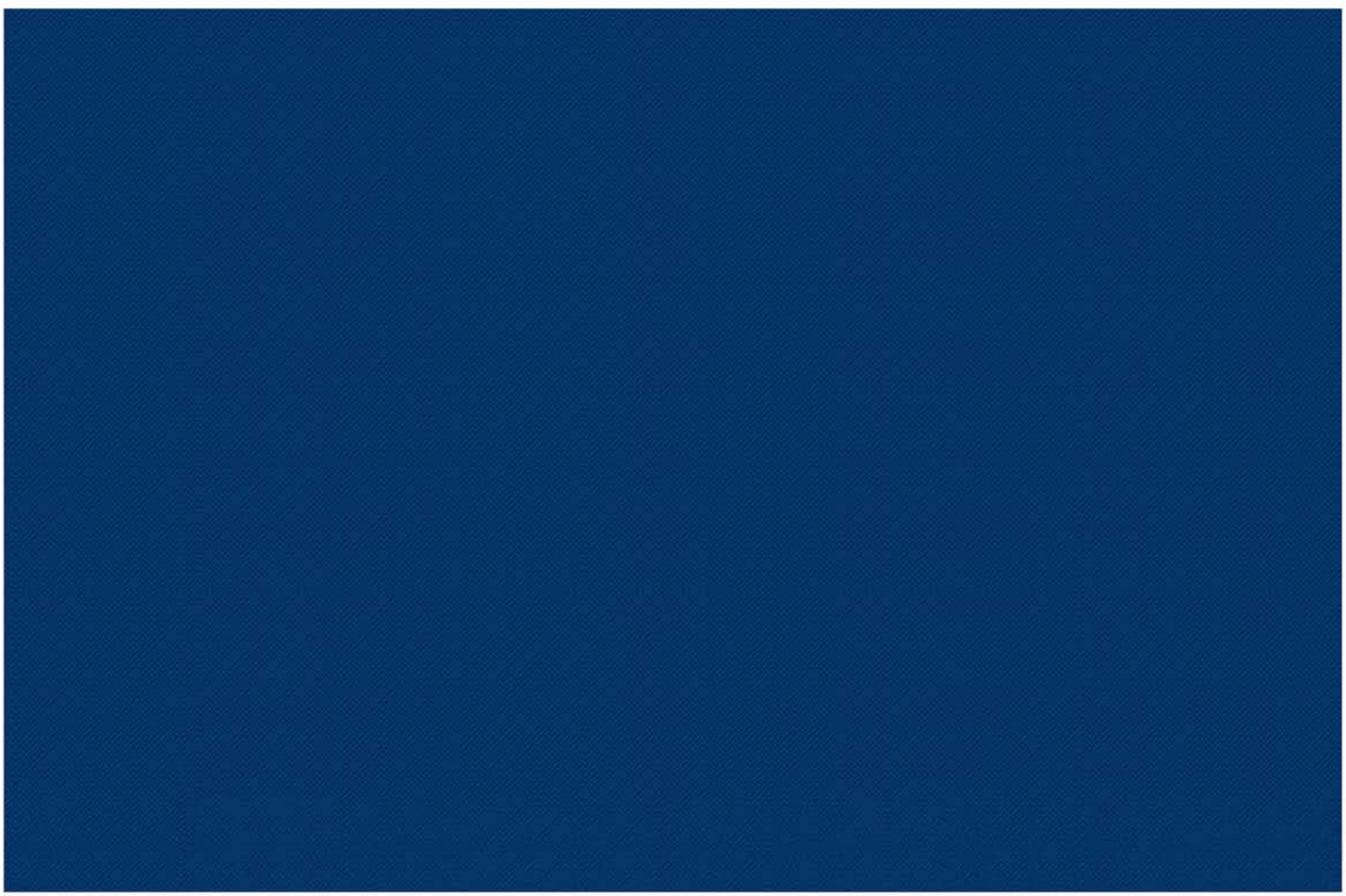
The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	SOLAR | Solar Panel Please select structure type and complete location point information.
Latitude:	39 Deg 5 M 23.33 S N
Longitude:	89 Deg 28 M 40.27 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	618 (nearest foot)
Structure Height :	20 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.





Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

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- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

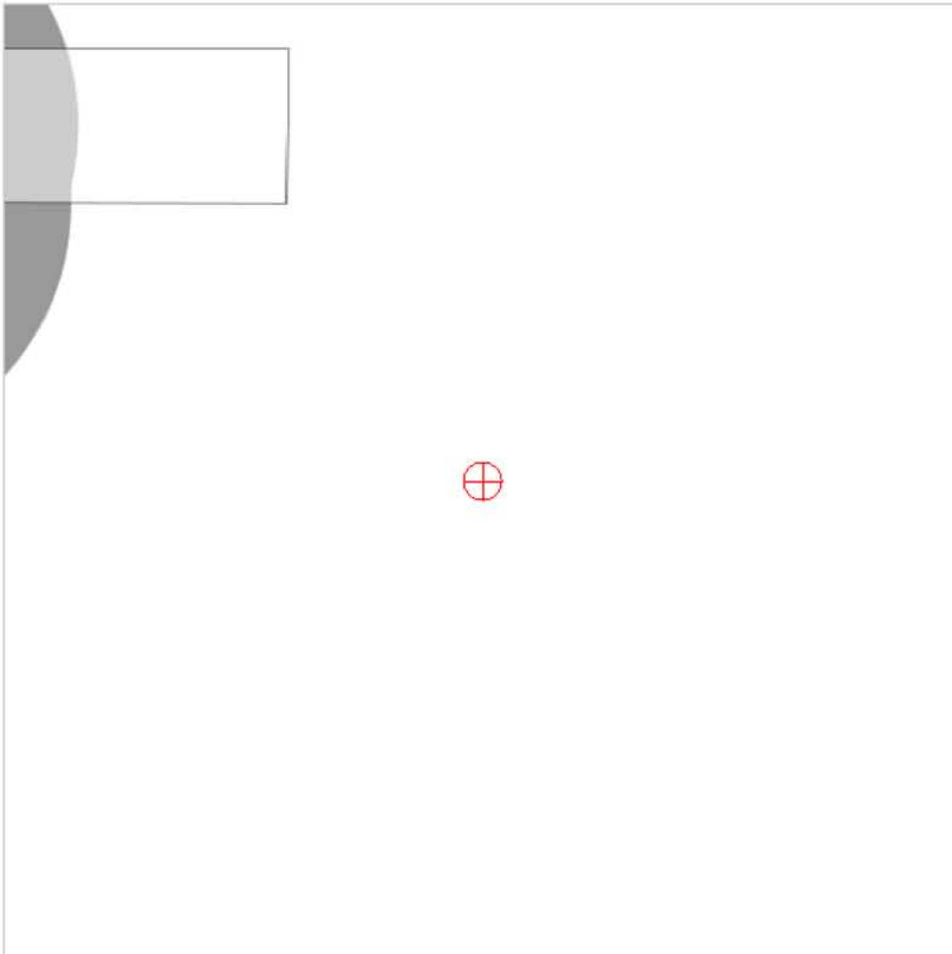
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	SOLAR | Solar Panel Please select structure type and complete location point information.
Latitude:	39 Deg 5 M 23.44 S N
Longitude:	89 Deg 29 M 13.27 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	618 (nearest foot)
Structure Height :	20 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

Results

You do not exceed Notice Criteria.



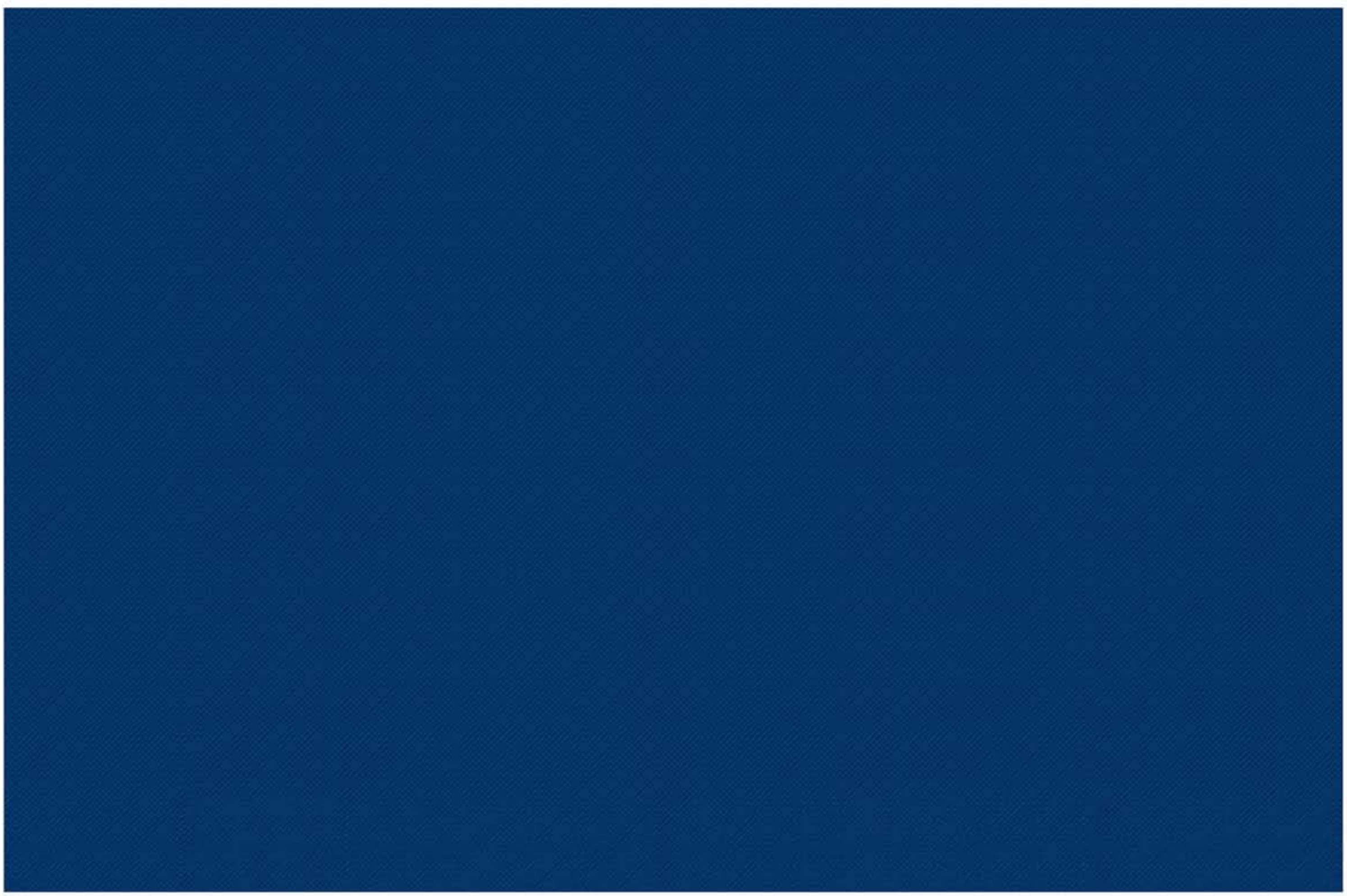
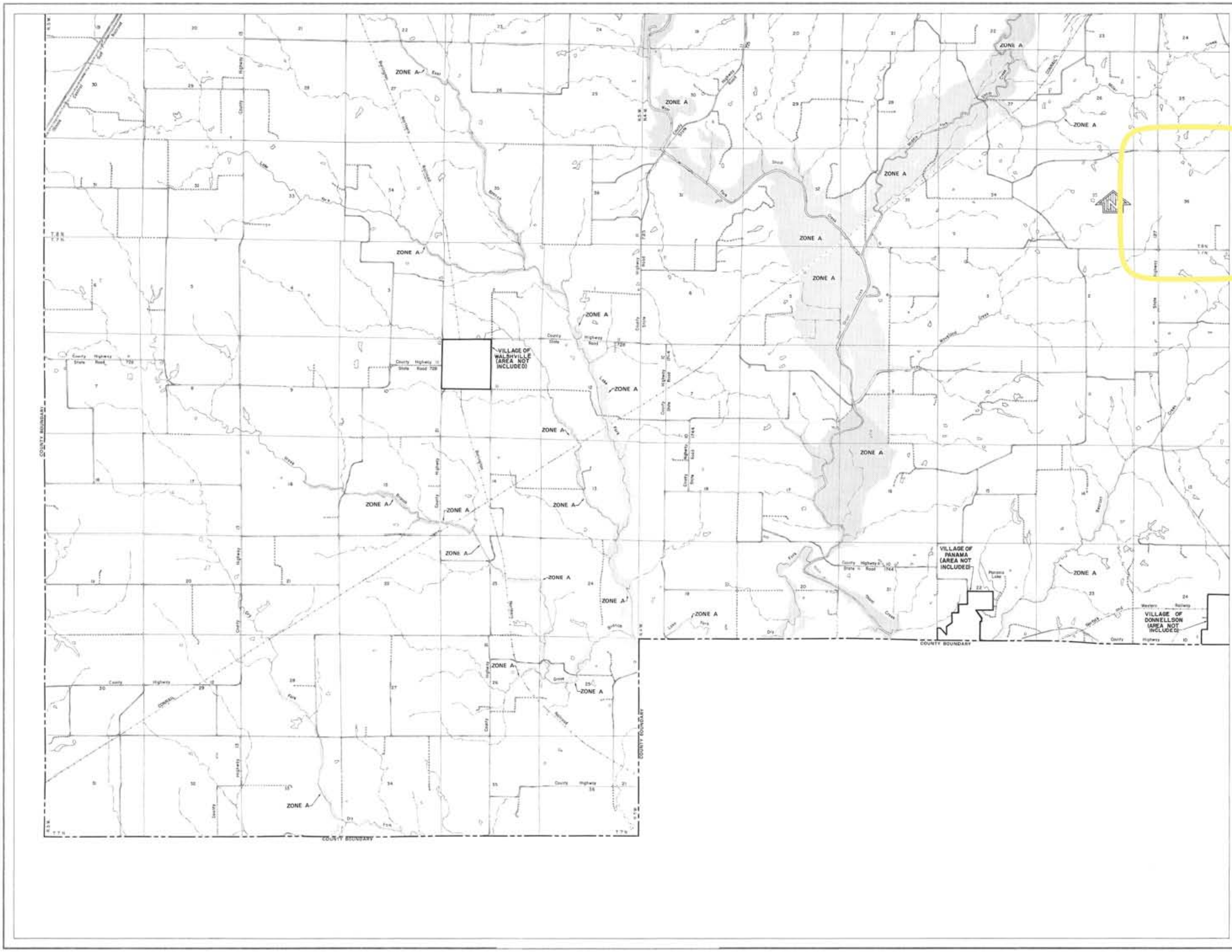


Exhibit J: FEMA



KEY TO SYMBOLS

ZONE A

NATIONAL FLOOD INSURANCE PROGRAM

FHBM

FLOOD HAZARD BOUNDARY MAP

MONTGOMERY COUNTY, ILLINOIS

UNINCORPORATED AREA

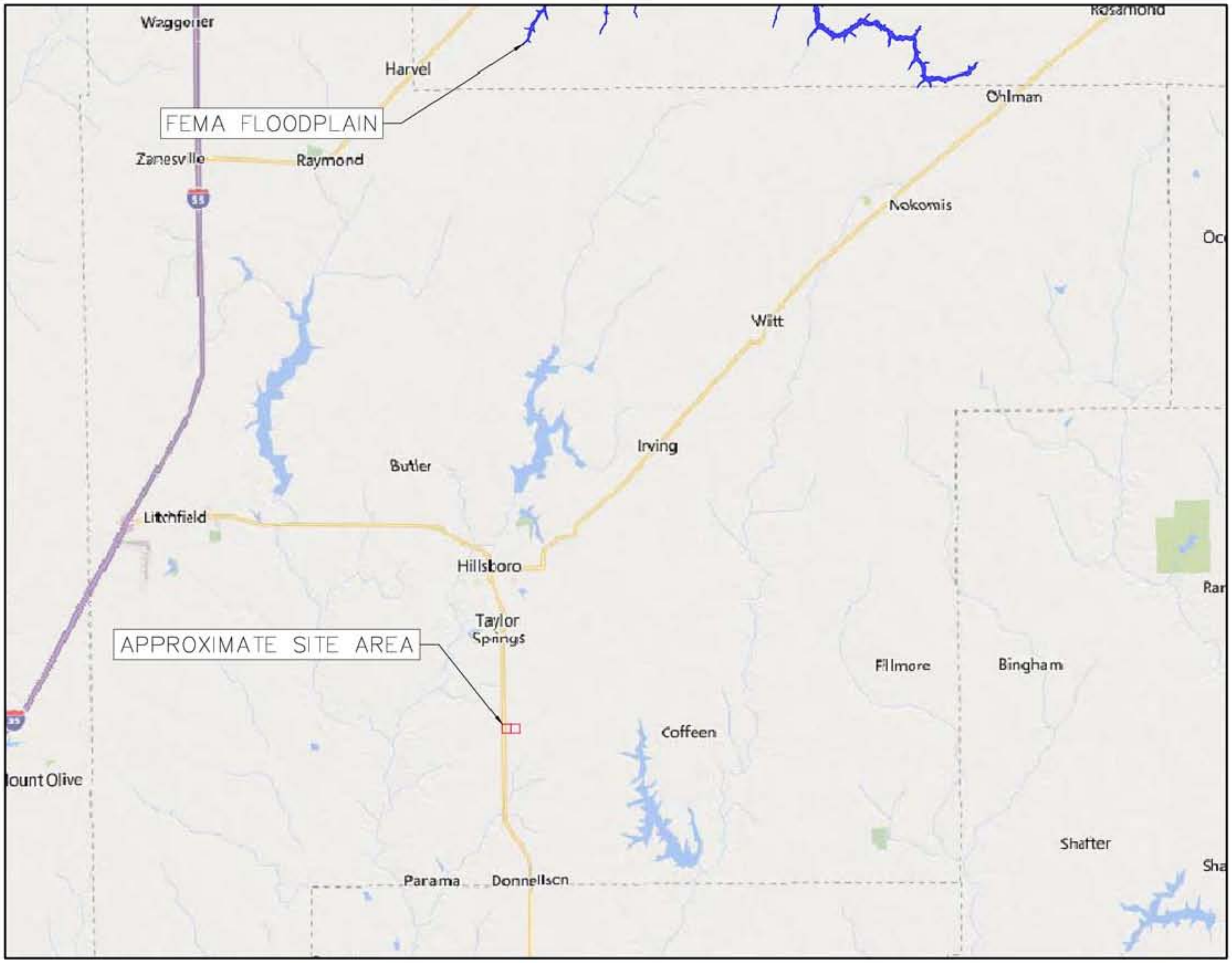
PANEL 8 OF 9

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
170992 0008 A

EFFECTIVE DATE:
JANUARY 9, 1981

federal emergency management agency
federal insurance administration



LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

FEMA FLOODPLAIN

NOTE: NO FEMA FLOODPLAIN DATA AVAILABLE FOR MONTGOMERY COUNTY, ILLINOIS.

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

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MONTGOMERY COUNTY, MICHIGAN

CLIENT
ATTICUS SOLAR
HILLSBORO TOWNSHIP, MONTGOMERY COUNTY, MI
FEMA FLOODPLAIN MAP

DATE 04/23/2025

REVISIONS

0 3750' 7500'
SCALE: 1"=7500'

DR.	ZE
CH.	BS
P.M.	DB
BOOK	---
JOB	25001794
SHEET NO.	01

CAD FILE: 24009016-FEMA.DWG

Exhibit K: Health and Safety Studies

WHITE PAPER

Health and Safety Impacts of Solar Photovoltaics

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May 2017

NC CLEAN ENERGY TECHNOLOGY CENTER

NC STATE UNIVERSITY

Contents

Health and Safety Impacts of Solar Photovoltaics

The increasing presence of utility-scale solar photovoltaic (PV) systems (sometimes referred to as solar farms) is a rather new development in North Carolina's landscape. Due to the new and unknown nature of this technology, it is natural for communities near such developments to be concerned about health and safety impacts. Unfortunately, the quick emergence of utility-scale solar has cultivated fertile grounds for myths and half-truths about the health impacts of this technology, which can lead to unnecessary fear and conflict.

Photovoltaic (PV) technologies and solar inverters are not known to pose any significant health dangers to their neighbors. The most important dangers posed are increased highway traffic during the relative short construction period and dangers posed to trespassers of contact with high voltage equipment. This latter risk is mitigated by signage and the security measures that industry uses to deter trespassing. As will be discussed in more detail below, risks of site contamination are much less than for most other industrial uses because PV technologies employ few toxic chemicals and those used are used in very small quantities. Due to the reduction in the pollution from fossil-fuel-fired electric generators, the overall impact of solar development on human health is overwhelmingly positive. This pollution reduction results from a partial replacement of fossil-fuel fired generation by emission-free PV-generated electricity, which reduces harmful sulfur dioxide (SO2), nitrogen oxides (NOx), and fine particulate matter (PM2.5). Analysis from the National Renewable Energy Laboratory and the Lawrence Berkeley National Laboratory, both affiliates of the U.S. Department of Energy, estimates the health-related air quality benefits to the southeast region from solar PV generators to be worth 8.0 ¢ per kilowatt-hour of solar generation.[1] This is in addition to the value of the electricity and suggests that the air quality benefits of solar are worth more than the electricity itself.

Even though we have only recently seen large-scale installation of PV technologies, the technology and its potential impacts have been studied since the 1950s. A combination of this solar-specific research and general scientific research has led to the scientific community having a good understanding of the science behind potential health and safety impacts of solar energy. This paper utilizes the latest scientific literature and knowledge of solar practices in N.C. to address the health and safety risks associated with solar PV technology. These risks are extremely small, far less than those associated with common activities such as driving a car, and vastly outweighed by health benefits of the generation of clean electricity.

This paper addresses the potential health and safety impacts of solar PV development in North Carolina, organized into the following four categories:

(1) Hazardous Materials
(2) Electromagnetic Fields (EMF)
(3) Electric Shock and Arc Flash
(4) Fire Safety

1 • Hazardous Materials

One of the more common concerns towards solar is that the panels (referred to as "modules" in the solar industry) consist of toxic materials that endanger public health. However, as shown in this section, solar energy systems may contain small amounts of toxic materials, but these materials do not endanger public health. To understand potential toxic hazards coming from a solar project, one must understand system installation, materials used, the panel end-of-life protocols, and system operation. This section will examine these aspects of a solar farm and the potential for toxicity impacts in the following subsections:

(1.2) Project Installation/Construction
(1.2) System Components
- 1.2.1 Solar Panels: Construction and Durability
- 1.2.2 Photovoltaic technologies
  - (a) Crystalline Silicon
  - (b) Cadmium Telluride (CdTe)
  - (c) CIS/CIGS
- 1.2.3 Panel End of Life Management
- 1.2.4 Non-panel System Components

(1.3) Operations and Maintenance

1.1 Project Installation/ Construction

The system installation, or construction, process does not require toxic chemicals or processes. The site is mechanically cleared of large vegetation, fences are constructed, and the land is surveyed to layout exact installation locations. Trenches for underground wiring are dug and support posts are driven into the ground. The solar panels are bolted to steel and aluminum support structures and wired together. Inverter pads are installed, and an inverter and transformer are installed on each pad. Once everything is connected, the system is tested, and only then turned on.

Figure 1: Utility-scale solar facility (5 MWAC) located in Catawba County. *Source: Strata Solar*

1.2 • System Components

1.2.1 Solar Panels: Construction and Durability

Solar PV panels typically consist of glass, polymer, aluminum, copper, and semiconductor materials that can be recovered and recycled at the end of their useful life.[2] Today there are two PV technologies used in PV panels at utility-scale solar facilities, silicon, and thin film. As of 2016, all thin film used in North Carolina solar facilities are cadmium telluride (CdTe) panels from the US manufacturer First Solar, but there are other thin film PV panels available on the market, such as Solar Frontier's CIGS panels. Crystalline silicon technology consists of silicon wafers which are made into cells and assembled into panels, thin film technologies consist of thin layers of semiconductor material deposited onto glass, polymer or metal substrates. While there are differences in the components and manufacturing processes of these two types of solar technologies, many aspects of their PV panel construction are very similar. Specifics about each type of PV chemistry as it relates to toxicity are covered in subsections a, b, and c in section 1.2.2; on crystalline silicon, cadmium telluride, and CIS/CIGS respectively. The rest of this section applies equally to both silicon and thin film panels.

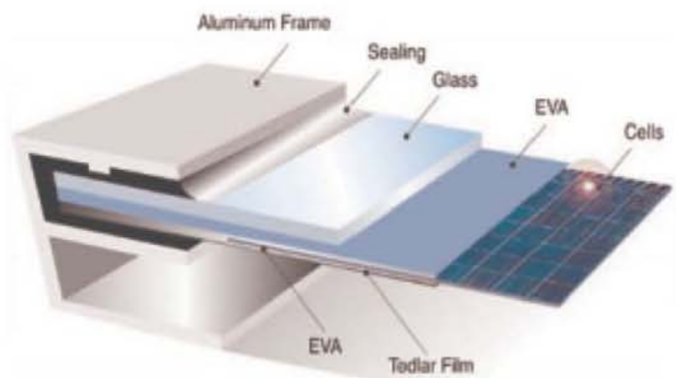

Figure 2: Components of crystalline silicon panels. The vast majority of silicon panels consist of a glass sheet on the topside with an aluminum frame providing structural support. Image Source: www.riteksolar.com.tw

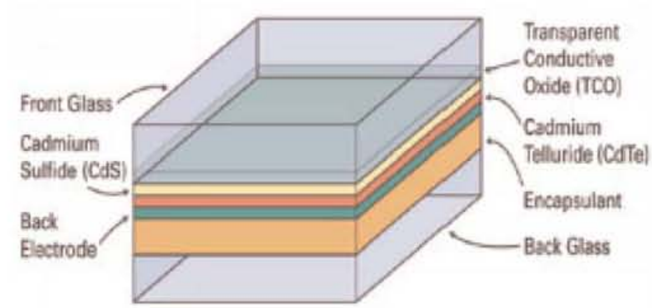

Figure 3: Layers of a common frameless thin-film panel (CdTe). Many thin film panels are frameless, including the most common thin-film panels, First Solar's CdTe. Frameless panels have protective glass on both the front and back of the panel. Layer thicknesses not to scale. Image Source: www.homepower.com

To provide decades of corrosion-free operation, PV cells in PV panels are encapsulated from air and moisture between two layers of plastic. The encapsulation layers are protected on the top with a layer of tempered glass and on the backside with a polymer sheet. Frameless modules include a protective layer of glass on the rear of the panel, which may also be tempered. The plastic ethylene-vinyl acetate (EVA) commonly provides the cell encapsulation. For decades, this same material has been used between layers of tempered glass to give car windshields and hurricane windows their great strength. In the same way that a car windshield cracks but stays intact, the EVA layers in PV panels keep broken panels intact (see Figure 4). Thus, a damaged module does not generally create small pieces of debris; instead, it largely remains together as one piece.

Figure 4: The mangled PV panels in this picture illustrate the nature of broken solar panels; the glass cracks but the panel is still in one piece. Image Source: http://img.alibaba.com/photo/115259576/broken_solar_panel.jpg

PV panels constructed with the same basic components as modern panels have been installed across the globe for well over thirty years.[3] The long-term durability and performance demonstrated over these decades, as well as the results of accelerated lifetime testing, helped lead to an industrystandard 25-year power production warranty for PV panels. These power warranties warrant a PV panel to produce at least 80% of their original nameplate production after 25 years of use. A recent SolarCity and DNV GL study reported that today's quality PV panels should be expected to reliably and efficiently produce power for thirty-five years.[4]

Local building codes require all structures, including ground mounted solar arrays, to be engineered to withstand anticipated wind speeds, as defined by the local wind speed requirements. Many racking products are available in versions engineered for wind speeds of up to 150 miles per hour, which is significantly higher than the wind speed requirement anywhere in North Carolina. The strength of PV mounting structures were demonstrated during Hurricane Sandy in 2012 and again during Hurricane Matthew in 2016. During Hurricane Sandy, the many large-scale solar facilities in New Jersey and New York at that time suffered only minor damage.[5] In the fall of 2016, the US and Caribbean experienced destructive winds and torrential rains from Hurricane Matthew, yet one leading solar tracker manufacturer reported that their numerous systems in the impacted area received zero damage from wind or flooding.[6]

In the event of a catastrophic event capable of damaging solar equipment, such as a tornado, the system will almost certainly have property insurance that will cover the cost to cleanup and repair the project. It is in the best interest of the system owner to protect their investment against such risks. It is also in their interest to get the project repaired and producing full power as soon as possible. Therefore, the investment in adequate insurance is a wise business practice for the system owner. For the same reasons, adequate insurance coverage is also generally a requirement of the bank or firm providing financing for the project.

1.2.2 Photovoltaic (PV) Technologies

a. Crystalline Silicon

This subsection explores the toxicity of silicon-based PV panels and concludes that they do not pose a material risk of toxicity to public health and safety. Modern crystalline silicon PV panels, which account for over 90% of solar PV panels installed today, are, more or less, a commodity product. The overwhelming majority of panels installed in North Carolina are crystalline silicon panels that are informally classified as Tier I panels. Tier I panels are from well-respected manufacturers that have a good chance of being able to honor warranty claims. Tier I panels are understood to be of high quality, with predictable performance, durability, and content. Well over 80% (by weight) of the content of a PV panel is the tempered glass front and the aluminum frame, both of which are common building materials. Most of the remaining portion are common plastics, including polyethylene terephthalate in the backsheet, EVA encapsulation of the PV cells, polyphenyl ether in the junction box, and polyethylene insulation on the wire leads. The active, working components of the system are the silicon photovoltaic cells, the small electrical leads connecting them together, and to the wires coming out of the back of the panel. The electricity generating and conducting components makeup less than 5% of the weight of most panels. The PV cell itself is nearly 100% silicon, and silicon is the second most common element in the Earth's crust. The silicon for PV cells is obtained by high-temperature processing of quartz sand (SiO_2) that removes its oxygen molecules. The refined silicon is converted to a PV cell by adding extremely small amounts of boron and phosphorus, both of which are common and of very low toxicity.

The other minor components of the PV cell are also generally benign; however, some contain lead, which is a human toxicant that is particularly harmful to young children. The minor components include an extremely thin antireflective coating (silicon nitride or titanium dioxide), a thin layer of aluminum on the rear, and thin strips of silver alloy that are screen-printed on the front and rear of cell.[7] In order for the front and rear electrodes to make effective electrical contact with the proper layer of the PV cell, other materials (called glass frit) are mixed with the silver alloy and then heated to etch the metals into the cell. This glass frit historically contains a small amount of lead (Pb) in the form of lead oxide. The 60 or 72 PV cells in a PV panel are connected by soldering thin solder-covered copper tabs from the back of one cell to the front of the next cell. Traditionally a tin-based solder containing some lead (Pb) is used, but some manufacturers have switched to lead-free solder. The glass frit and/or the solder may contain trace amounts of other metals, potentially including some with human toxicity such as cadmium. However, testing to simulate the potential for leaching from broken panels, which is discussed in more detail below, did not find a potential toxicity threat from these trace elements. Therefore, the tiny amount of lead in the grass frit and the solder is the only part of silicon PV panels with a potential to create a negative health impact. However, as described below, the very limited amount of lead involved and its strong physical and chemical attachment to other components of the PV panel means that even in worst-case scenarios the health hazard it poses is insignificant.

As with many electronic industries, the solder in silicon PV panels has historically been a leadbased solder, often 36% lead, due to the superior properties of such solder. However, recent advances in lead-free solders have spurred a trend among PV panel manufacturers to reduce or remove the lead in their panels. According to the 2015 Solar Scorecard from the Silicon Valley Toxics Coalition, a group that tracks environmental responsibility of photovoltaic panel manufacturers, fourteen companies (increased from twelve companies in 2014) manufacture PV panels certified to meet the European Restriction of Hazardous Substances (RoHS) standard. This means that the amount of cadmium and lead in the panels they manufacture fall below the RoHS thresholds, which are set by the European Union and serve as the world's de facto standard for hazardous substances in manufactured goods.[8] The Restriction of Hazardous Substances (RoHS) standard requires that the maximum concentration found in any homogenous material in a produce is less than 0.01% cadmium and less than 0.10% lead, therefore, any solder can be no more than 0.10% lead.[9]

While some manufacturers are producing PV panels that meet the RoHS standard, there is no requirement that they do so because the RoHS Directive explicitly states that the directive does not apply to photovoltaic panels.[10] The justification for this is provided in item 17 of the current RoHS Directive: "The development of renewable forms of energy is one of the Union's key objectives, and the contribution made by renewable energy sources to environmental and climate objectives is crucial. Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (4) recalls that there should be coherence between those objectives and other Union environmental legislation. Consequently, this Directive should not prevent the development of renewable energy technologies that have no negative impact on health and the environment and that are sustainable and economically viable."

The use of lead is common in our modern economy. However, only about 0.5% of the annual lead consumption in the U.S. is for electronic solder for all uses; PV solder makes up only a tiny portion of this 0.5%. Close to 90% of lead consumption in the US is in batteries, which do not encapsulate the pounds of lead contained in each typical automotive battery. This puts the lead in batteries at great risk of leaching into the environment. Estimates for the lead in a single PV panel with lead-based solder range from 1.6 to 24 grams of lead, with 13g (less than half of an ounce) per panel seen most often in the literature.[11] At 13 g/panel[12], each panel contains one-half of the lead in a typical 12-gauge shotgun shell. This amount equates to roughly 1/750th of the lead in a single car battery. In a panel, it is all durably encapsulated from air or water for the full life of the panel.[14]

As indicated by their 20 to 30-year power warranty, PV modules are designed for a long service life, generally over 25 years. For a panel to comply with its 25-year power warranty, its internal components, including lead, must be sealed from any moisture. Otherwise, they would corrode and the panel's output would fall below power warranty levels. Thus, the lead in operating PV modules is not at risk of release to the environment during their service lifetime. In extreme experiments, researchers have shown that lead can leach from crushed or pulverized panels.[15, 16] However, more real-world tests designed to represent typical trash compaction that are used to classify waste as hazardous or non-hazardous show no danger from leaching.[17,18] For more information about PV panel end-of-life, see the Panel Disposal section.

As illustrated throughout this section, silicon-based PV panels do not pose a material threat to public health and safety. The only aspect of the panels with potential toxicity concerns is the very small amount of lead in some panels. However, any lead in a panel is well sealed from environmental exposure for the operating lifetime of the solar panel and thus not at risk of release into the environment.

b. Cadmium Telluride (CdTe) PV Panels

This subsection examines the components of a cadmium telluride (CdTe) PV panel. Research demonstrates that they pose negligible toxicity risk to public health and safety while significantly reducing the public's exposure to cadmium by reducing coal emissions. As of mid-2016, a few hundred MWs of cadmium telluride (CdTe) panels, all manufactured by the U.S. company First Solar, have been installed in North Carolina.

Questions about the potential health and environmental impacts from the use of this PV technology are related to the concern that these panels contain cadmium, a toxic heavy metal. However, scientific studies have shown that cadmium telluride differs from cadmium due to its high chemical and thermal stability.[19] Research has shown that the tiny amount of cadmium in these panels does not pose a health or safety risk.[20] Further, there are very compelling reasons to welcome its adoption due to reductions in unhealthy pollution associated with burning coal. Every GWh of electricity generated by burning coal produces about 4 grams of cadmium air emissions.[21] Even though North Carolina produces a significant fraction of our electricity from coal, electricity from solar offsets much more natural gas than coal due to natural gas plants being able to adjust their rate of production more easily and quickly. If solar electricity offsets 90% natural gas and 10% coal, each 5-megawatt (5 MWAC, which is generally 7 MWDC) CdTe solar facility in North Carolina keeps about 157 grams, or about a third of a pound, of cadmium *out* of our environment.[22, 23]

Cadmium is toxic, but all the approximately 7 grams of cadmium in one CdTe panel is in the form of a chemical compound cadmium telluride,[24] which has 1/100th the toxicity of free cadmium.[25] Cadmium telluride is a very stable compound that is non-volatile and non-soluble in water. Even in the case of a fire, research shows that less than 0.1% of the cadmium is released when a CdTe panel is exposed to fire. The fire melts the glass and encapsulates over 99.9% of the cadmium in the molten glass.[27]

It is important to understand the source of the cadmium used to manufacture CdTe PV panels. The cadmium is a byproduct of zinc and lead refining. The element is collected from emissions and waste streams during the production of these metals and combined with tellurium to create the CdTe used in PV panels. If the cadmium were not collected for use in the PV panels or other products, it would otherwise either be stockpiled for future use, cemented and buried, or disposed of.[28] Nearly all the cadmium in old or broken panels can be recycled which can eventually serve as the primary source of cadmium for new PV panels.[29]

Similar to silicon-based PV panels, CdTe panels are constructed of a tempered glass front, one instead of two clear plastic encapsulation layers, and a rear heat strengthened glass backing (together >98% by weight). The final product is built to withstand exposure to the elements without significant damage for over 25 years. While not representative of damage that may occur in the field or even at a landfill, laboratory evidence has illustrated that when panels are ground into a fine powder, very acidic water is able to leach portions of the cadmium and tellurium,[30] similar to the process used to recycle CdTe panels. Like many silicon-based panels, CdTe panels are reported (as far back ask 1998[31] to pass the EPA's Toxic Characteristic Leaching Procedure (TCLP) test, which tests the potential for crushed panels in a landfill to leach hazardous substances into groundwater.[32] Passing this test means that they are classified as non-hazardous waste and can be deposited in landfills.[33,34] For more information about PV panel end-of-life, see the Panel Disposal section.

There is also concern of environmental impact resulting from potential catastrophic events involving CdTe PV panels. An analysis of worst-case scenarios for environmental impact from CdTe PV panels, including earthquakes, fires, and floods, was conducted by the University of Tokyo in 2013. After reviewing the extensive international body of research on CdTe PV technology, their report concluded, "Even in the worst-case scenarios, it is unlikely that the Cd concentrations in air and sea water will exceed the environmental regulation values."[35] In a worst-case scenario of damaged panels abandoned on the ground, insignificant amounts of cadmium will leach from the panels. This is because this scenario is much less conducive (larger module pieces, less acidity) to leaching than the conditions of the EPA's TCLP test used to simulate landfill conditions, which CdTe panels pass.[36]

First Solar, a U.S. company, and the only significant supplier of CdTe panels, has a robust panel take-back and recycling program that has been operating commercially since 2005.[37] The company states that it is "committed to providing a commercially attractive recycling solution for photovoltaic (PV) power plant and module owners to help them meet their module (end of life) EOL obligation simply, costeffectively and responsibly." First Solar global recycling services to their customers to collect and recycle panels once they reach the end of productive life whether due to age or damage. These recycling service agreements are structured to be financially attractive to both First Solar and the solar panel owner. For First Solar, the contract provides the company with an affordable source of raw materials needed for new panels and presumably a diminished risk of undesired release of Cd. The contract also benefits the solar panel owner by allowing them to avoid tipping fees at a waste disposal site. The legal contract helps provide peace of mind by ensuring compliance by both parties when considering the continuing trend of rising disposal costs and increasing regulatory requirements.

c. CIS/CIGS and other PV technologies

Copper indium gallium selenide PV technology, often referred to as CIGS, is the second most common type of thin-film PV panel but a distant second behind CdTe. CIGS cells are composed of a thin layer of copper, indium, gallium, and selenium on a glass or plastic backing. None of these elements are very toxic, although selenium is a regulated metal under the Federal Resource Conservation and Recovery Act (RCRA).[38] The cells often also have an extremely thin layer of cadmium sulfide that contains a tiny amount of cadmium, which is toxic. The promise of high efficiency CIGS panels drove heavy investment in this technology in the past. However, researchers have struggled to transfer high efficiency success in the lab to low-cost full-scale panels in the field.[39] Recently, a CIGS manufacturer based in Japan, Solar Frontier, has achieved some market success with a rigid, glass-faced CIGS module that competes with silicon panels. Solar Frontier produces the majority of CIS panels on the market today.[40] Notably, these panels are RoHS compliant,[41] thus meeting the rigorous toxicity standard adopted by the European Union even thought this directive exempts PV panels. The authors are unaware of any completed or proposed utility-scale system in North Carolina using CIS/CIGS panels.

1.2.3 Panel End-of-Life Management

Concerns about the volume, disposal, toxicity, and recycling of PV panels are addressed in this subsection. To put the volume of PV waste into perspective, consider that by 2050, when PV systems installed in 2020 will reach the end of their lives, it is estimated that the global annual PV panel waste tonnage will be 10% of the 2014 global e-waste tonnage.[42] In the U.S., end-of-life disposal of solar products is governed by the Federal Resource Conservation and Recovery Act (RCRA), as well as state policies in some situations. RCRA separates waste into hazardous (not accepted at ordinary landfill) and solid waste (generally accepted at ordinary landfill) based on a series of rules. According to RCRA, the way to determine if a PV panel is classified as hazardous waste is the Toxic Characteristic Leaching Procedure (TCLP) test. This EPA test is designed to simulate landfill disposal and determine the risk of hazardous substances leaching out of the landfill.[43,44,45] Multiple sources report that most modern PV panels (both crystalline silicon and cadmium telluride) pass the TCLP test.[46,47] Some studies found that some older (1990s) crystalline silicon panels, and perhaps some newer crystalline silicon panels (specifics are not given about vintage of panels tested), do not pass the lead (Pb) leachate limits in the TCLP test.[48,49]

The test begins with the crushing of a panel into centimeter-sized pieces. The pieces are then mixed in an acid bath. After tumbling for eighteen hours, the fluid is tested for forty hazardous substances that all must be below specific threshold levels to pass the test. Research comparing TCLP conditions to conditions of damaged panels in the field found that simulated landfill conditions provide overly conservative estimates of leaching for field-damaged panels.[50] Additionally, research in Japan has found no detectable Cd leaching from cracked CdTe panels when exposed to simulated acid rain.[51]

Although modern panels can generally be landfilled, they can also be recycled. Even though recent waste volume has not been adequate to support significant PV-specific recycling infrastructure, the existing recycling industry in North Carolina reports that it recycles much of the current small volume of broken PV panels. In an informal survey conducted by the NC Clean Energy Technology Center survey in early 2016, seven of the eight large active North Carolina utility-scale solar developers surveyed reported that they send damaged panels back to the manufacturer and/or to a local recycler. Only one developer reported sending damaged panels to the landfill. The developers reported at that time that they are usually paid a small amount per panel by local recycling firms. In early 2017, a PV developer reported that a local recycler was charging a small fee per panel to recycle damaged PV panels. The local recycling firm known to authors to accept PV panels described their current PV panel recycling practice as of early 2016 as removing the aluminum frame for local recycling and removing the wire leads for local copper recycling. The remainder of the panel is sent to a facility for processing the non-metallic portions of crushed vehicles, referred to as "fluff" in the recycling industry.[52] This processing within existing general recycling plants allows for significant material recovery of major components, including glass which is 80% of the module weight, but at lower yields than PV-specific recycling plants. Notably almost half of the material value in a PV panel is in the few grams of silver contained in almost every PV panel produced today. In the long-term, dedicated PV panel recycling plants can increase treatment capacities and maximize revenues resulting in better output quality and the ability to recover a greater fraction of the useful materials.[53] PV-specific panel recycling technologies have been researched and implemented to some extent for the past decade, and have been shown to be able to recover over 95% of PV material (semiconductor) and over 90% of the glass in a PV panel.[54]

A look at global PV recycling trends hints at the future possibilities of the practice in our country. Europe installed MW-scale volumes of PV years before the U.S. In 2007, a public-private partnership between the European Union and the solar industry set up a voluntary collection and recycling system called PV CYCLE. This arrangement was later made mandatory under the EU's WEEE directive, a program for waste electrical and electronic equipment.[55] Its member companies (PV panel producers) fully finance the association. This makes it possible for end-users to return the member companies' defective panels for recycling at any of the over 300 collection points around

Europe without added costs. Additionally, PV CYCLE will pick up batches of 40 or more used panels at no cost to the user. This arrangement has been very successful, collecting and recycling over 13,000 tons by the end of 2015.[56]

In 2012, the WEEE Directive added the end-of-life collection and recycling of PV panels to its scope.[57] This directive is based on the principle of extended-producer-responsibility. It has a global impact because producers that want to sell into the EU market are legally responsible for end-of-life management. Starting in 2018, this directive targets that 85% of PV products "put in the market" in Europe are recovered and 80% is prepared for reuse and recycling.

The success of the PV panel collection and recycling practices in Europe provides promise for the future of recycling in the U.S. In mid-2016, the US Solar Energy Industry Association (SEIA) announced that they are starting a national solar panel recycling program with the guidance and support of many leading PV panel producers.[58] The program will aggregate the services offered by recycling vendors and PV manufacturers, which will make it easier for consumers to select a cost-effective and environmentally responsible end-of-life management solution for their PV products. According to SEIA, they are planning the program in an effort to make the entire industry landfill-free. In addition to the national recycling network program, the program will provide a portal for system owners and consumers with information on how to responsibly recycle their PV systems.

While a cautious approach toward the potential for negative environmental and/or health impacts from retired PV panels is fully warranted, this section has shown that the positive health impacts of reduced emissions from fossil fuel combustion from PV systems more than outweighs any potential risk. Testing shows that silicon and CdTe panels are both safe to dispose of in landfills, and are also safe in worst case conditions of abandonment or damage in a disaster. Additionally, analysis by local engineers has found that the current salvage value of the equipment in a utility scale PV facility generally exceeds general contractor estimates for the cost to remove the entire PV system.[59,60,61]

1.2.4 Non-Panel System Components

(racking, wiring, inverter, transformer)

While previous toxicity subsections discussed PV panels, this subsection describes the non-panel components of utility-scale PV systems and investigates any potential public health and safety concerns. The most significant non-panel component of a ground-mounted PV system is the mounting structure of the rows of panels, commonly referred to as "racking". The vertical post portion of the racking is galvanized steel and the remaining above-ground racking components are either galvanized steel or aluminum, which are both extremely common and benign building materials. The inverters that make the solar generated electricity ready to send to the grid have weather-proof steel enclosures that protect the working components from the elements. The only fluids that they might contain are associated with their cooling systems, which are not unlike the cooling system in a computer. Many inverters today are RoHS compliant.

The electrical transformers (to boost the inverter output voltage to the voltage of the utility connection point) do contain a liquid cooling oil. However, the fluid used for that function is either a nontoxic mineral oil or a biodegradable non-toxic vegetable oil, such as BIOTEMP from ABB. These vegetable transformer oils have the additional advantage of being much less flammable than traditional mineral oils. Significant health hazards are associated with old transformers containing cooling oil with toxic PCBs. Transfers with PCB-containing oil were common before PCBs were outlawed in the U.S. in 1979. PCBs still exist in older transformers in the field across the country.

Other than a few utility research sites, there are no batteries on- or off-site associated with utility-scale solar energy facilities in North Carolina, avoiding any potential health or safety concerns related to battery technologies. However, as battery technologies continue to improve and prices continue to decline we are likely to start seeing some batteries at solar facilities. Lithium ion batteries currently dominate the world utility-scale battery market, which are not very toxic. No non-panel system components were found to pose any health or environmental dangers.

1.4 Operations and Maintenance – Panel Washing and Vegetation Control

Throughout the eastern U.S., the climate provides frequent and heavy enough rain to keep panels adequately clean. This dependable weather pattern eliminates the need to wash the panels on a regular basis. Some system owners may choose to wash panels as often as once a year to increase production, but most in N.C. do not regularly wash any PV panels. Dirt build up over time may justify panel washing a few times over the panels' lifetime; however, nothing more than soap and water are required for this activity.

The maintenance of ground-mounted PV facilities requires that vegetation be kept low, both for aesthetics and to avoid shading of the PV panels. Several approaches are used to maintain vegetation at NC solar facilities, including planting of limited-height species, mowing, weed-eating, herbicides, and grazing livestock (sheep). The following descriptions of vegetation maintenance practices are based on interviews with several solar developers as well as with three maintenance firms that together are contracted to maintain well over 100 of the solar facilities in N.C. The majority of solar facilities in North Carolina maintain vegetation primarily by mowing. Each row of panels has a single row of supports, allowing sickle mowers to mow under the panels. The sites usually require mowing about once a month during the growing season. Some sites employ sheep to graze the site, which greatly reduces the human effort required to maintain the vegetation and produces high quality lamb meat.[62]

In addition to mowing and weed eating, solar facilities often use some herbicides. Solar facilities generally do not spray herbicides over the entire acreage; rather they apply them only in strategic locations such as at the base of the perimeter fence, around exterior vegetative buffer, on interior dirt roads, and near the panel support posts. Also unlike many row crop operations, solar facilities generally use only general use herbicides, which are available over the counter, as opposed to restricted use herbicides commonly used in commercial agriculture that require a special restricted use license. The herbicides used at solar facilities are primarily 2-4-D and glyphosate (Round-up®), which are two of the most common herbicides used in lawns, parks, and agriculture across the country. One maintenance firm that was interviewed sprays the grass with a class of herbicide known as a growth regulator in order to slow the growth of grass so that mowing is only required twice a year. Growth regulators are commonly used on highway roadsides and golf courses for the same purpose. A commercial pesticide applicator license is required for anyone other than the landowner to apply herbicides, which helps ensure that all applicators are adequately educated about proper herbicide use and application. The license must be renewed annually and requires passing of a certification exam appropriate to the area in which the applicator wishes to work. Based on the limited data available, it appears that solar facilities in N.C. generally use significantly less herbicides per acre than most commercial agriculture or lawn maintenance services.

2. Electromagnetic Fields (EMF)

PV systems do not emit any material during their operation; however, they do generate electromagnetic fields (EMF), sometimes referred to as radiation. EMF produced by electricity is non-ionizing radiation, meaning the radiation has enough energy to move atoms in a molecule around (experienced as heat), but not enough energy to remove electrons from an atom or molecule (ionize) or to damage DNA. As shown below, modern humans are all exposed to EMF throughout our daily lives without negative health impact. Someone outside of the fenced perimeter of a solar facility is not exposed to significant EMF from the solar facility. Therefore, there is no negative health impact from the EMF produced in a solar farm. The following paragraphs provide some additional background and detail to support this conclusion.

Since the 1970s, some have expressed concern over potential health consequences of EMF from electricity, but no studies have ever shown this EMF to cause health problems.[63] These concerns are based on some epidemiological studies that found a slight increase in childhood leukemia associated with average exposure to residential power-frequency magnetic fields above 0.3 to 0.4 μT (microteslas) (equal to 3.0 to 4.0 mG (milligauss)). μT and mG are both units used to measure magnetic field strength. For comparison, the average exposure for people in the U.S. is one mG or 0.1 μT, with about 1% of the population with an average exposure in excess of 0.4 μT (or 4 mG).[64] These epidemiological studies, which found an association but not a causal relationship, led the World Health Organization's International Agency for Research on Cancer (IARC) to classify ELF magnetic fields as "possibly carcinogenic to humans". Coffee also has this classification. This classification means there is limited evidence but not enough evidence to designate as either a "probable carcinogen" or "human carcinogen". Overall, there is very little concern that ELF EMF damages public health. The only concern that does exist is for long-term exposure above 0.4 μT (4 mG) that may have some connection to increased cases of childhood leukemia. In 1997, the National Academies of Science were directed by Congress to examine this concern and concluded:

"Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects."[65]

There are two aspects to electromagnetic fields, an electric field and a magnetic field. The electric field is generated by voltage and the magnetic field is generated by electric current, i.e., moving electrons. A task group of scientific experts convened by the World Health Organization (WHO) in 2005 concluded that there were no substantive health issues related to electric fields (0 to 100,000 Hz) at levels generally encountered by members of the public.[66] The relatively low voltages in a solar facility and the fact that electric fields are easily shielded (i.e., blocked) by common materials, such as plastic, metal, or soil means that there is no concern of negative health impacts from the electric fields generated by a solar facility. Thus, the remainder of this section addresses magnetic fields. Magnetic fields are not shielded by most common materials and thus can easily pass through them. Both types of fields are strongest close to the source of electric generation and weaken quickly with distance from the source.

The direct current (DC) electricity produced by PV panels produce stationary (0 Hz) electric and magnetic fields. Because of minimal concern about potential risks of stationary fields, little scientific research has examined stationary fields' impact on human health.[67] In even the largest PV facilities, the DC voltages and currents are not very high. One can illustrate the weakness of the EMF generated by a PV panel by placing a compass on an operating solar panel and observing that the needle still points north.

While the electricity throughout the majority of a solar site is DC electricity, the inverters convert this DC electricity to alternating current (AC) electricity matching the 60 Hz frequency of the grid. Therefore, the inverters and the wires delivering this power to the grid are producing non-stationary EMF, known as extremely low frequency (ELF) EMF, normally oscillating with a frequency of 60 Hz. This frequency is at the low-energy end of the electromagnetic spectrum. Therefore, it has less energy than other commonly encountered types of non-ionizing radiation like radio waves, infrared radiation, and visible light.

The wide use of electricity results in background levels of ELF EMFs in nearly all locations where people spend time – homes, workplaces, schools, cars, the supermarket, etc. A person's average exposure depends upon the sources they encounter, how close they are to them, and the amount of time they spend there.[68] As stated above, the average exposure to magnetic fields in the U.S. is estimated to be around one mG or 0.1 μT, but can vary considerably depending on a person's exposure to EMF from electrical devices and wiring.[69] At times we are often exposed to much higher ELF magnetic fields, for example when standing three feet from a refrigerator the ELF magnetic field is 6 mG and when standing three feet from a microwave oven the field is about 50 mG.[70] The strength of these fields diminish quickly with distance from the source, but when surrounded by electricity in our homes and other buildings moving away from one source moves you closer to another. However, unless you are inside of the fence at a utility-scale solar facility or electrical substation it is impossible to get very close to the EMF sources. Because of this, EMF levels at the fence of electrical substations containing high voltages and currents are considered "generally negligible".[71,72]

The strength of ELF-EMF present at the perimeter of a solar facility or near a PV system in a commercial or residential building is significantly lower than the typical American's average EMF exposure.[73,74] Researchers in Massachusetts measured magnetic fields at PV projects and found the magnetic fields dropped to very low levels of 0.5 mG or less, and in many cases to less than background levels (0.2 mG), at distances of no more than nine feet from the residential inverters and 150 feet from the utility-scale inverters.[75] Even when measured within a few feet of the utility-scale inverter, the ELF magnetic fields were well below the International Commission on Non-Ionizing Radiation Protection's recommended magnetic field level exposure limit for the general public of 2,000 mG.[76] It is typical that utility scale designs locate large inverters central to the PV panels that feed them because this minimizes the length of wire required and shields neighbors from the sound of the inverter's cooling fans. Thus, it is rare for a large PV inverter to be within 150 feet of the project's security fence.

Anyone relying on a medical device such as pacemaker or other implanted device to maintain proper heart rhythm may have concern about the potential for a solar project to interfere with the operation of his or her device. However, there is no reason for concern because the EMF outside of the solar facility's fence is less than 1/1000 of the level at which manufacturers test for ELF EMF interference, which is 1,000 mG.[77] Manufacturers of potentially affected implanted devices often provide advice on electromagnetic interference that includes avoiding letting the implanted device get too close to certain sources of fields such as some household appliances, some walkie-talkies, and similar transmitting devices. Some manufacturers' literature does not mention high-voltage power lines, some say that exposure in public areas should not give interference, and some advise not spending extended periods of time close to power lines.[78]

3. Electric Shock and Arc Flash Hazards

There is a real danger of electric shock to anyone entering any of the electrical cabinets such as combiner boxes, disconnect switches, inverters, or transformers; or otherwise coming in contact with voltages over 50 Volts.[79] Another electrical hazard is an arc flash, which is an explosion of energy that can occur in a short circuit situation. This explosive release of energy causes a flash of heat and a shockwave, both of which can cause serious injury or death. Properly trained and equipped technicians and electricians know how to safely install, test, and repair PV systems, but there is always some risk of injury when hazardous voltages and/or currents are present. Untrained individuals should not attempt to inspect, test, or repair any aspect of a PV system due to the potential for injury or death due to electric shock and arc flash, The National Electric Code (NEC) requires appropriate levels of warning signs on all electrical components based on the level of danger determined by the voltages and current potentials. The national electric code also requires the site to be secured from unauthorized visitors with either a six-foot chain link fence with three strands of barbed wire or an eight-foot fence, both with adequate hazard warning signs.

4. Fire Safety

The possibility of fires resulting from or intensified by PV systems may trigger concern among the general public as well as among firefighters. However, concern over solar fire hazards should be limited because only a small portion of materials in the panels are flammable, and those components cannot self-support a significant fire. Flammable components of PV panels include the thin layers of polymer encapsulates surrounding the PV cells, polymer backsheets (framed panels only), plastic junction boxes on rear of panel, and insulation on wiring. The rest of the panel is composed of non-flammable components, notably including one or two layers of protective glass that make up over three quarters of the panel's weight.

Heat from a small flame is not adequate to ignite a PV panel, but heat from a more intense fire or energy from an electrical fault can ignite a PV panel.[80] One real-world example of this occurred during July 2015 in an arid area of California. Three acres of grass under a thin film PV facility burned without igniting the panels mounted on fixed-tilt racks just above the grass.[81] While it is possible for electrical faults in PV systems on homes or commercial buildings to start a fire, this is extremely rare.[82] Improving understanding of the PV-specific risks, safer system designs, and updated fire-related codes and standards will continue to reduce the risk of fire caused by PV systems.

PV systems on buildings can affect firefighters in two primary ways, 1) impact their methods of fighting the fire, and 2) pose safety hazard to the firefighters. One of the most important techniques that firefighters use to suppress fire is ventilation of a building's roof. This technique allows super-heated toxic gases to quickly exit the building. By doing so, the firefighters gain easier and safer access to the building, Ventilation of the roof also makes the challenge of putting out the fire easier. However, the placement of rooftop PV panels may interfere with ventilating the roof by limiting access to desired venting locations.

New solar-specific building code requirements are working to minimize these concerns. Also, the latest National Electric Code has added requirements that make it easier for first responders to safely and effectively turn off a PV system. Concern for firefighting a building with PV can be reduced with proper fire fighter training, system design, and installation. Numerous organizations have studied fire fighter safety related to PV. Many organizations have published valuable guides and training programs. Some notable examples are listed below.

- The International Association of Fire Fighters (IAFF) and International Renewable Energy Council (IREC) partnered to create an online training course that is far beyond the PowerPoint click-andview model. The self-paced online course, “Solar PV Safety for Fire Fighters,” features rich video content and simulated environments so fire fighters can practice the knowledge they’ve learned. www.iaff.org/pvsafetytraining
- Photovoltaic Systems and the Fire Code: Office of NC Fire Marshal
- Fire Service Training, Underwriter’s Laboratory
- Firefighter Safety and Response for Solar Power Systems, National Fire Protection Research Foundation
- Bridging the Gap: Fire Safety & Green Buildings, National Association of State Fire Marshalls
- Guidelines for Fire Safety Elements of Solar Photovoltaic Systems, Orange County Fire Chiefs Association
- Solar Photovoltaic Installation Guidelines, California Department of Forestry & Fire Protection, Office of the State Fire Marshall
- PV Safety & Firefighting, Matthew Paiss, Homepower Magazine
- PV Safety and Code Development: Matthew Paiss, Cooperative Research Network

Summary

The purpose of this paper is to address and alleviate concerns of public health and safety for utility-scale solar PV projects. Concerns of public health and safety were divided and discussed in the four following sections: (1) Toxicity, (2) Electromagnetic Fields, (3) Electric Shock and Arc Flash, and (4) Fire. In each of these sections, the negative health and safety impacts of utility-scale PV development were shown to be negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts.

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Solar Panels. Photo by Mariana Proenca on Unsplash

"Clean Energy in Michigan" Series, Number 12

Facts about solar panels: PFAS contamination

By Dr. Annick Anctil, Michigan State University

Q: Do solar panels contribute to PFAS contamination?

Multiple states have raised concerns about PFAS contamination from solar farms, largely citing academic research on how PFAS could *potentially* be used in photovoltaic (PV) solar panels.[1] The fact is that PFAS is *not* customarily used in solar panels because safer, effective alternatives have already been developed and commercialized. Moreover, no studies have shown the presence or leaching of PFAS from PV panels—either while they are in active use or at the end of their life (e.g., in a landfill).

Anatomy of a solar panel

These three parts of a solar panel cause confusion about the presence of PFAS.

Self-Cleaning Coat

A self-cleaning coating on the top of a solar panel helps reduce dust, pollen, and snow adhesion, extending both the power output and the lifetime of the panel.[2] Multiple self-cleaning coating options are available on the market, many of which make use of non-hazardous silicon-based chemistry.[3] Confusion comes from the fact that some other commercialized self-cleaning coating options do make use of PFAS-based chemicals, although even those do not degrade under normal use.

Adhesives

PV panels are sealed from the elements to maximize power output and lifetime. While PFAS chemicals are found in certain adhesives, such as carpentry glues, they are not typically used in sealant adhesives for solar panels.[4] Instead, solar adhesives are based on silicone polymers, which are well known for their lack of negative health impacts and remarkable stability.[5]

Substrate

PV modules are housed in a weather-resistant substrate that offers additional protection from the elements. Thin-film PV units use glass as the substrate, while crystalline silicon PV units use a polymer substrate, which has led to the rumors of

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The Clean Energy in Michigan series provides case studies and fact sheets answering common questions about clean energy projects in Michigan.

Find this document and more about the project online at graham.umich.edu/climate-energy/energy-futures.

potential PFAS use in solar panels. The most common polymer used in silicon PV units is Tedlar, a weather resistant polymer that is *not* a PFAS compound itself and makes no use of PFAS during its manufacturing process.[6] Far more common materials, like those used in construction projects and weather resistant fabrics, present a higher risk of PFAS exposure than PV. In fact, a recent study found that these more common materials release PFAS under conditions where solar panels do not, indicating that PFAS exposure risk may be higher sitting on outdoor furniture, for example, than living next to a solar farm.[7]

What is PFAS anyway?

Per/Poly Fluoro-Alkyl Substances, PFAS for short, are a class of chemical compounds. PFAS are used in several industries for their unique properties, notably their ability to create coatings that are highly water repellent.

PFAS are extremely persistent within the environment, not breaking down over time. Certain PFAS compounds have been linked to human health issues–notably low infant birth weights, increased risk of certain cancers, and thyroid issues. As a result of their persistence and toxicity, those PFAS compounds that pose a significant risk have been banned from use and production, and subsequently replaced with safer alternatives.

It's important to note that not all PFAS compounds are dangerous. Some PFAS compounds, such as Teflon, are much more stable and present no risk to human health under normal conditions of use.[8]

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Health and Safety Impacts of Solar Photovoltaics:

A California-Focused Forward to the Health and Safety Impacts of Solar Photovoltaics white paper published by the N.C. Clean Energy Technology Center at North Carolina State University in May 2017

By: Thomas H. Cleveland, P.E., lead author of the North Carolina white paper
RE: Soscol Ferry Road Solar, a proposed 1.98 MW_{AC} PV facility in Napa, CA
Date: July 31, 2019

For the last several years North Carolina (NC) has trailed only California in the capacity of annual solar photovoltaic (PV) installed. For most of that time North Carolina's PV development was nearly entirely distribution-connected ground-mounted solar facilities, most commonly 5 MW_{AC} projects. More recently, North Carolina is developing a mixture of transmission-connected PV facilities between 20 and 75 MW_{AC} and distribution-connected facilities of 1 to 5 MW_{AC}, but still has relatively few commercial or residential PV projects. As the state quickly transitioned from zero utility-scale solar facilities to over 400 utility-scale solar facilities concerns about the health and safety impacts of photovoltaics were raised at countless public hearings across the state and in many meetings of state officials and regulators, including several NC general assembly committee meetings. These concerns led to several years of engagement on this topic by the NC Clean Energy Technology Center at North Carolina State University that resulted in a detailed, peer-reviewed university white paper on the latest scientific understanding regarding PV health and safety impacts, with a focus on North Carolina.

Naturally, there is also interest in the potential health and safety impacts of PV in California, where there is significantly more installed solar capacity than in North Carolina, in a mixture of residential, commercial, and small- and large-scale ground-mounted utility-scale solar projects. While there are massive similarities between the PV installations and their potential health and safety impacts in each state, there are some differences in policy, climate, industry practices, electricity regulation, and more that are worth highlighting. This forward is an attempt by the lead researcher and author of the North Carolina white paper to provide a supplement to the original paper that clearly demonstrates the applicability of the paper to PV in California and to offer California-specific supplements or modifications where the original paper had a North Carolina focus.

Most importantly, all the white paper's conclusions about the negligible negative health and safety impacts of photovoltaics apply fully in California, as well as anywhere in the United States. Similarly, there is nothing unique about the 1.98 MW_{AC} Soscol Ferry Road Solar project that would cause any health or safety impacts different than those discussed in the N.C. white paper.

Throughout the white paper there are instances of North Carolina-specific information, or issues where the situation in California is different than it is in North Carolina. The following is a list of the significant instances of either situation, in the order they appear in the white paper, along with the relevant California-specific information.

- <u>Type of PV Technology Used</u>: Crystalline silicon, Cadmium Telluride (CdTe), and CIGS are all being installed in California as they are in N.C. Since the publication of the N.C. report the author has confirmed the recent installation of utility-scale projects using CIGS modules, but these are still not common. Like in NC, the majority of the current PV installation capacity in California is crystalline silicon, also like NC these are generally Tier I modules. The Soscol Ferry Rd. project will use Tier I crystalline silicon modules.
- <u>Design Wind Speed</u>: The ASCE 7-2016 design wind speed in the vast majority of California, including in Napa County where the Soscol Ferry Road Solar project is located, is 90-95 MPH, which is much lower than the design wind speeds of hurricane-prone eastern N.C. where most PV development in the state is located. A few mountainous regions of California have design wind speeds over 100 MPG, however these extreme

terrains are unlikely to install ground-mounted PV systems.

- Offset Electricity Fuel Mix: The white paper includes a rough estimation that the fuel mix of the generators offset by PV energy production in N.C. is 90% natural gas and 10% coal. From this mix an estimate of the reduction in cadmium emissions due to PV was calculated. The 10% coal estimate is certainly too high for California. An offset fuel mix for California could be reasonably estimated as 100% natural gas, resulting in about 75% of the cadmium emissions savings calculated for NC.
- PV Module Recycling: The white paper included local reports from PV developers in North Carolina of recycling damaged PV modules. It is quite possible that the same is occurring in California, but the author does not have data on the current common waste management practices for damaged PV modules in California. The Electric Power Research Institute (EPRI) published two extensive reports on the Photovoltaic Module Recycling in the United States (April 2018) and Insights in Photovoltaic Recycling Processes in Europe (December 2017), which are great sources for current information on PV module recycling. The EPRI report on recycling in the U.S. states that there are commercial recyclers in the U.S. accepting and recycling PV modules, using processes not unlike those described in the white paper.
- PV Module Washing: Unlike North Carolina, many regions of California regularly experience long periods of time with little to no rain, which can result in enough accumulation of dirt on the PV modules that it justifies occasionally washing the modules to renew their performance. In North Carolina there is generally a heavy rain often enough to keep the panels clean enough to not require manual panel washing. This difference does not have an impact on the health or safety impact of the photovoltaic modules other than perhaps some increased risk of electric shock when washing the modules. Proper installation, maintenance, and washing techniques should reduce this risk to near zero.
- Vegetation Maintenance: The climate in many regions of California, including Napa County where the Soscol Ferry Road Solar project is located, cause the growth of vegetation requiring maintenance to be less vigorous than the vegetation in moist North Carolina. Thus, PV sites in California use similar vegetation maintenance techniques to North Carolina however they need to spend less time and make fewer trips to adequately maintain vegetation on site.
- California Hazardous Waste Policy:
    - As explained in the white paper, in the United States a waste material is considered hazardous waste if the results of a Toxicity Characteristic Leaching Procedure (TCLP) test find concentrations of any of 40 hazardous chemicals above the allowed EPA concentration limit for that chemical. However, in California, materials must additionally meet the more stringent Hazardous Waste Control Law (HWCL), which is like the Reduction of Hazardous Substances (ROHS) directive, adopted in February 2003 by the European Union (EU).[i]
    - In 2015, California passed SB-489 directing the CA DTSC (Department of Toxic Substances Control) to write rules to reclassify PV modules as universal waste, even if they fail TCLP. These rules exclude physically damaged, fractured, or fragmented PV modules that are no longer recognizable as PV modules.[ii] A primary goal of the legislation is to allow producers of waste PV modules to avoid difficult and costly waste determination procedures. In April 2019 the CA DTSC proposed rules to implement SB-489. After the public comment period that ended in June 2019 DTSC may adjust and adopt the rules.[iii]

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IRONWOOD RENEWABLES

Exhibit L: Hydrologic Response of Solar Farms & Wetland Delineation

Hydrologic Response of Solar Farms

Lauren M. Cook, S.M.ASCE[1]; and Richard H. McCuen, M.ASCE[2]

Abstract: Because of the benefits of solar energy, the number of solar farms is increasing; however, their hydrologic impacts have not been studied. The goal of this study was to determine the hydrologic effects of solar farms and examine whether or not storm-water management is needed to control runoff volumes and rates. A model of a solar farm was used to simulate runoff for two conditions: the pre- and postpaneled conditions. Using sensitivity analyses, modeling showed that the solar panels themselves did not have a significant effect on the runoff volumes, peaks, or times to peak. However, if the ground cover under the panels is gravel or bare ground, owing to design decisions or lack of maintenance, the peak discharge may increase significantly with storm-water management needed. In addition, the kinetic energy of the flow that drains from the panels was found to be greater than that of the rainfall, which could cause erosion at the base of the panels. Thus, it is recommended that the grass beneath the panels be well maintained or that a buffer strip be placed after the most downgradient row of panels. This study, along with design recommendations, can be used as a guide for the future design of solar farms. **DOI: 10.1061/(ASCE)HE.1943-5584.0000530.** © *2013 American Society of Civil Engineers.*

CE Database subject headings: Hydrology; Land use; Solar power; Floods; Surface water; Runoff; Stormwater management.

Author keywords: Hydrology; Land use change; Solar energy; Flooding; Surface water runoff; Storm-water management.

Introduction

Storm-water management practices are generally implemented to reverse the effects of land-cover changes that cause increases in volumes and rates of runoff. This is a concern posed for new types of land-cover change such as the solar farm. Solar energy is a renewable energy source that is expected to increase in importance in the near future. Because solar farms require considerable land, it is necessary to understand the design of solar farms and their potential effect on erosion rates and storm runoff, especially the impact on offsite properties and receiving streams. These farms can vary in size from 8 ha (20 acres) in residential areas to 250 ha (600 acres) in areas where land is abundant.

The solar panels are impervious to rain water; however, they are mounted on metal rods and placed over pervious land. In some cases, the area below the panel is paved or covered with gravel. Service roads are generally located between rows of panels. Although some panels are stationary, others are designed to move so that the angle of the panel varies with the angle of the sun. The angle can range, depending on the latitude, from 22° during the summer months to 74° during the winter months. In addition, the angle and direction can also change throughout the day. The issue posed is whether or not these rows of impervious panels will change the runoff characteristics of the site, specifically increase runoff volumes or peak discharge rates. If the increases are hydrologically significant, storm-water management facilities may be needed. Additionally, it is possible that the velocity of water draining from the edge of the panels is sufficient to cause erosion of the soil below the panels, especially where the maintenance roadways are bare ground.

The outcome of this study provides guidance for assessing the hydrologic effects of solar farms, which is important to those who plan, design, and install arrays of solar panels. Those who design solar farms may need to provide for storm-water management. This study investigated the hydrologic effects of solar farms, assessed whether or not storm-water management might be needed, and if the velocity of the runoff from the panels could be sufficient to cause erosion of the soil below the panels.

Model Development

Solar farms are generally designed to maximize the amount of energy produced per unit of land area, while still allowing space for maintenance. The hydrologic response of solar farms is not usually considered in design. Typically, the panels will be arrayed in long rows with separations between the rows to allow for maintenance vehicles. To model a typical layout, a unit width of one panel was assumed, with the length of the downgradient strip depending on the size of the farm. For example, a solar farm with 30 rows of 200 panels each could be modeled as a strip of 30 panels with space between the panels for maintenance vehicles. Rainwater that drains from the upper panel onto the ground will flow over the land under the 29 panels on the downgradient strip. Depending on the land cover, infiltration losses would be expected as the runoff flows to the bottom of the slope.

To determine the effects that the solar panels have on runoff characteristics, a model of a solar farm was developed. Runoff in the form of sheet flow without the addition of the solar panels served as the prepaneled condition. The paneled condition assumed a downgradient series of cells with one solar panel per ground cell. Each cell was separated into three sections: wet, dry, and spacer.

The dry section is that portion directly underneath the solar panel, unexposed directly to the rainfall. As the angle of the panel from the horizontal increases, more of the rain will fall directly onto

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the ground; this section of the cell is referred to as the wet section. The spacer section is the area between the rows of panels used by maintenance vehicles. Fig. 1 is an image of two solar panels and the spacer section allotted for maintenance vehicles. Fig. 2 is a schematic of the wet, dry, and spacer sections with their respective dimensions. In Fig. 1, tracks from the vehicles are visible on what is modeled within as the spacer section. When the solar panel is horizontal, then the length longitudinal to the direction that runoff will occur is the length of the dry and wet sections combined. Runoff from a dry section drains onto the downgradient spacer section. Runoff from the spacer section flows to the wet section of the next downgradient cell. Water that drains from a solar panel falls directly onto the spacer section of that cell.

The length of the spacer section is constant. During a storm event, the loss rate was assumed constant for the 24-h storm because a wet antecedent condition was assumed. The lengths of the wet and dry sections changed depending on the angle of the solar panel. The total length of the wet and dry sections was set equal to the length of one horizontal solar panel, which was assumed to be 3.5 m. When a solar panel is horizontal, the dry section length would equal 3.5 m and the wet section length would be zero. In the paneled condition, the dry section does not receive direct rainfall because the rain first falls onto the solar panel then drains onto the spacer section. However, the dry section does infiltrate some of the runoff that comes from the upgradient wet section. The wet section was modeled similar to the spacer section with rain falling directly onto the section and assuming a constant loss rate.

For the presolar panel condition, the spacer and wet sections are modeled the same as in the paneled condition; however, the cell does not include a dry section. In the prepaneled condition, rain falls directly onto the entire cell. When modeling the prepaneled condition, all cells receive rainfall at the same rate and are subject to losses. All other conditions were assumed to remain the same such that the prepaneled and paneled conditions can be compared.

Rainfall was modeled after an natural resources conservation service (NRCS) Type II Storm (McCuen 2005) because it is an accurate representation of actual storms of varying characteristics that are imbedded in intensity-duration-frequency (IDF) curves. For each duration of interest, a dimensionless hyetograph was developed using a time increment of 12 s over the duration of the storm (see Fig. 3). The depth of rainfall that corresponds to each storm magnitude was then multiplied by the dimensionless hyetograph. For a 2-h storm duration, depths of 40.6, 76.2, and 101.6 mm were used for the 2-, 25-, and 100-year events. The 2- and 6-h duration hyetographs were developed using the center portion of the 24-h storm, with the rainfall depths established with the Baltimore IDF curve. The corresponding depths for a 6-h duration were 53.3, 106.7, and 132.1 mm, respectively. These magnitudes were chosen to give a range of storm conditions.

During each time increment, the depth of rain is multiplied by the cell area to determine the volume of rain added to each section of each cell. This volume becomes the storage in each cell. Depending on the soil group, a constant volume of losses was subtracted from the storage. The runoff velocity from a solar panel was calculated using Manning's equation, with the hydraulic radius for sheet flow assumed to equal the depth of the storage on the panel (Bedient and Huber 2002). Similar assumptions were made to compute the velocities in each section of the surface sections.

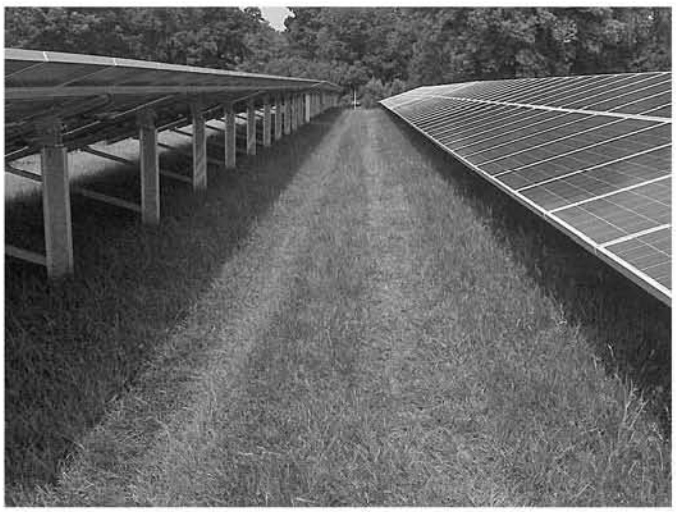

Fig. 1. Maintenance or "spacer" section between two rows of solar panels (photo by John E. Showler, reprinted with permission)

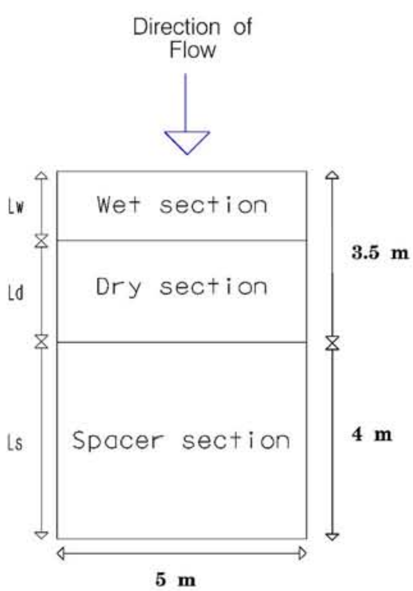

Fig. 2. Wet, dry, and spacer sections of a single cell with lengths *Lw*, *Ls*, and *Ld* with the solar panel covering the dry section

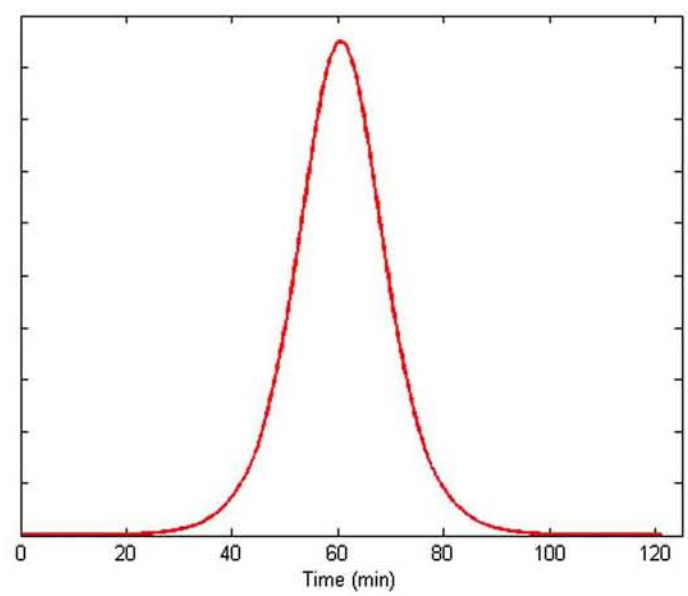

Fig. 3. Dimensionless hyetograph of 2-h Type II storm

Runoff from one section to the next and then to the next downgradient cell was routed using the continuity of mass. The routing coefficient depended on the depth of flow in storage and the velocity of runoff. Flow was routed from the wet section to the dry section to the spacer section, with flow from the spacer section draining to the wet section of the next cell. Flow from the most downgradient cell was assumed to be the outflow. Discharge rates and volumes from the most downgradient cell were used for comparisons between the prepaneled and paneled conditions.

Alternative Model Scenarios

To assess the effects of the different variables, a section of 30 cells, each with a solar panel, was assumed for the base model. Each cell was separated individually into wet, dry, and spacer sections. The area had a total ground length of 225 m with a ground slope of 1% and width of 5 m, which was the width of an average solar panel. The roughness coefficient (Engman 1986) for the silicon solar panel was assumed to be that of glass, 0.01. Roughness coefficients of 0.15 for grass and 0.02 for bare ground were also assumed. Loss rates of 0.5715 cm/h (0.225 in./h) and 0.254 cm/h (0.1 in./h) for B and C soils, respectively, were assumed.

The prepaneled condition using the 2-h, 25-year rainfall was assumed for the base condition, with each cell assumed to have a good grass cover condition. All other analyses were made assuming a paneled condition. For most scenarios, the runoff volumes and peak discharge rates from the paneled model were not significantly greater than those for the prepaneled condition. Over a total length of 225 m with 30 solar panels, the runoff increased by 0.26 m^3, which was a difference of only 0.35%. The slight increase in runoff volume reflects the slightly higher velocities for the paneled condition. The peak discharge increased by 0.0013 m^3, a change of only 0.31%. The time to peak was delayed by one time increment, i.e., 12 s. Inclusion of the panels did not have a significant hydrologic impact.

Storm Magnitude

The effect of storm magnitude was investigated by changing the magnitude from a 25-year storm to a 2-year storm. For the 2-year storm, the rainfall and runoff volumes decreased by approximately 50%. However, the runoff from the paneled watershed condition increased compared to the prepaneled condition by approximately the same volume as for the 25-year analysis, 0.26 m^3. This increase represents only a 0.78% increase in volume. The peak discharge and the time to peak did not change significantly. These results reflect runoff from a good grass cover condition and indicated that the general conclusion of very minimal impacts was the same for different storm magnitudes.

Ground Slope

The effect of the downgradient ground slope of the solar farm was also examined. The angle of the solar panels would influence the velocity of flows from the panels. As the ground slope was increased, the velocity of flow over the ground surface would be closer to that on the panels. This could cause an overall increase in discharge rates. The ground slope was changed from 1 to 5%, with all other conditions remaining the same as the base conditions.

With the steeper incline, the volume of losses decreased from that for the 1% slope, which is to be expected because the faster velocity of the runoff would provide less opportunity for infiltration. However, between the prepaneled and paneled conditions, the increase in runoff volume was less than 1%. The peak discharge and the time to peak did not change. Therefore, the greater ground slope did not significantly influence the response of the solar farm.

Soil Type

The effect of soil type on the runoff was also examined. The soil group was changed from B soil to C soil by varying the loss rate. As expected, owing to the higher loss rate for the C soil, the depths of runoff increased by approximately 7.5% with the C soil when compared with the volume for B soils. However, the runoff volume for the C soil condition only increased by 0.17% from the prepaneled condition to the paneled condition. In comparison with the B soil, a difference of 0.35% in volume resulted between the two conditions. Therefore, the soil group influenced the actual volumes and rates, but not the relative effect of the paneled condition when compared to the prepaneled condition.

Panel Angle

Because runoff velocities increase with slope, the effect of the angle of the solar panel on the hydrologic response was examined. Analyses were made for angles of 30° and 70° to test an average range from winter to summer. The hydrologic response for these angles was compared to that of the base condition angle of 45°. The other site conditions remained the same. The analyses showed that the angle of the panel had only a slight effect on runoff volumes and discharge rates. The lower angle of 30° was associated with an increased runoff volume, whereas the runoff volume decreased for the steeper angle of 70° when compared with the base condition of 45°. However, the differences (~0.5%) were very slight. Nevertheless, these results indicate that, when the solar panel was closer to horizontal, i.e., at a lower angle, a larger difference in runoff volume occurred between the prepaneled and paneled conditions. These differences in the response result are from differences in loss rates.

The peak discharge was also lower at the lower angle. At an angle of 30°, the peak discharge was slightly lower than at the higher angle of 70°. For the 2-h storm duration, the time to peak of the 30° angle was 2 min delayed from the time to peak of when the panel was positioned at a 70° angle, which reflects the longer travel times across the solar panels.

Storm Duration

To assess the effect of storm duration, analyses were made for 6-h storms, testing magnitudes for 2-, 25-, and 100-year return periods, with the results compared with those for the 2-h rainfall events. The longer storm duration was tested to determine whether a longer duration storm would produce a different ratio of increase in runoff between the prepaneled and paneled conditions. When compared to runoff volumes from the 2-h storm, those for the 6-h storm were 34% greater in both the paneled and prepaneled cases. However, when comparing the prepaneled to the paneled condition, the increase in the runoff volume with the 6-h storm was less than 1% regardless of the return period. The peak discharge and the time-to-peak did not differ significantly between the two conditions. The trends in the hydrologic response of the solar farm did not vary with storm duration.

Ground Cover

The ground cover under the panels was assumed to be a native grass that received little maintenance. For some solar farms, the area beneath the panel is covered in gravel or partially paved because the panels prevent the grass from receiving sunlight. Depending on the

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volume of traffic, the spacer cell could be grass, patches of grass, or bare ground. Thus, it was necessary to determine whether or not these alternative ground-cover conditions would affect the runoff characteristics. This was accomplished by changing the Manning's n for the ground beneath the panels. The value of n under the panels, i.e., the dry section, was set to 0.015 for gravel, with the value for the spacer or maintenance section set to 0.02, i.e., bare ground. These can be compared to the base condition of a native grass ($n = 0.15$). A good cover should promote losses and delay the runoff.

For the smoother surfaces, the velocity of the runoff increased and the losses decreased, which resulted in increasing runoff volumes. This occurred both when the ground cover under the panels was changed to gravel and when the cover in the spacer section was changed to bare ground. Owing to the higher velocities of the flow, runoff rates from the cells increased significantly such that it was necessary to reduce the computational time increment. Fig. 4(a) shows the hydrograph from a 30-panel area with a time increment of 12 s. With a time increment of 12 s, the water in each cell is discharged at the end of every time increment, which results in no attenuation of the flow; thus, the undulations shown in Fig. 4(a) result. The time increment was reduced to 3 s for the 2-h storm, which resulted in watershed smoothing and a rational hydrograph shape [Fig. 4(b)]. The results showed that the storm runoff increased by 7% from the grass-covered scenario to the scenario with gravel under the panel. The peak discharge increased by 73% for the gravel ground cover when compared with the grass cover without the panels. The time to peak was 10 min less with the gravel than with the grass, which reflects the effect of differences in surface roughness and the resulting velocities.

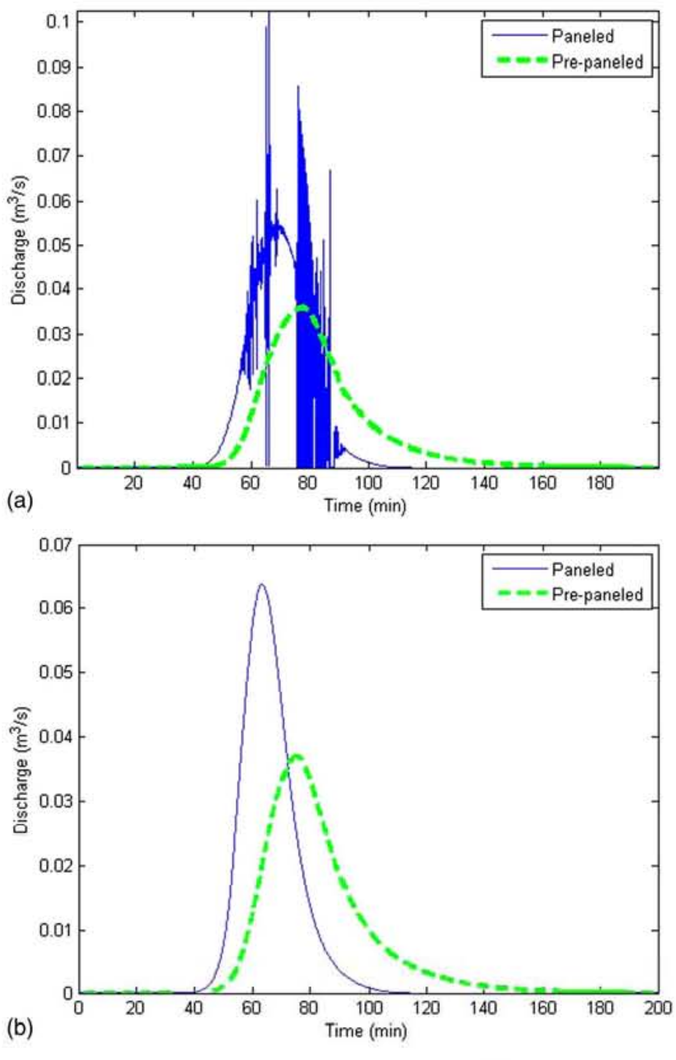

Fig. 4. Hydrograph with time increment of (a) 12 s; (b) 3 s with Manning's n for bare ground

If maintenance vehicles used the spacer section regularly and the grass cover was not adequately maintained, the soil in the spacer section would be compacted and potentially the runoff volumes and rates would increase. Grass that is not maintained has the potential to become patchy and turn to bare ground. The grass under the panel may not get enough sunlight and die. Fig. 1 shows the result of the maintenance trucks frequently driving in the spacer section, which diminished the grass cover.

The effect of the lack of solar farm maintenance on runoff characteristics was modeled by changing the Manning's n to a value of 0.02 for bare ground. In this scenario, the roughness coefficient for the ground under the panels, i.e., the dry section, as well as in the spacer cell was changed from grass covered to bare ground ($n = 0.02$).The effects were nearly identical to that of the gravel. The runoff volume increased by 7% from the grass-covered to the bare-ground condition. The peak discharge increased by 72% when compared with the grass-covered condition. The runoff for the bare-ground condition also resulted in an earlier time to peak by approximately 10 min. Two other conditions were also modeled, showing similar results. In the first scenario, gravel was placed directly under the panel, and healthy grass was placed in the spacer section, which mimics a possible design decision. Under these conditions, the peak discharge increased by 42%, and the volume of runoff increased by 4%, which suggests that storm-water management would be necessary if gravel is placed anywhere.

Fig. 5 shows two solar panels from a solar farm in New Jersey. The bare ground between the panels can cause increased runoff rates and reductions in time of concentration, both of which could necessitate storm-water management. The final condition modeled involved the assumption of healthy grass beneath the panels and bare ground in the spacer section, which would simulate the condition of unmaintained grass resulting from vehicles that drive over the spacer section. Because the spacer section is 53% of the cell, the change in land cover to bare ground would reduce losses and decrease runoff travel times, which would cause runoff to amass as it

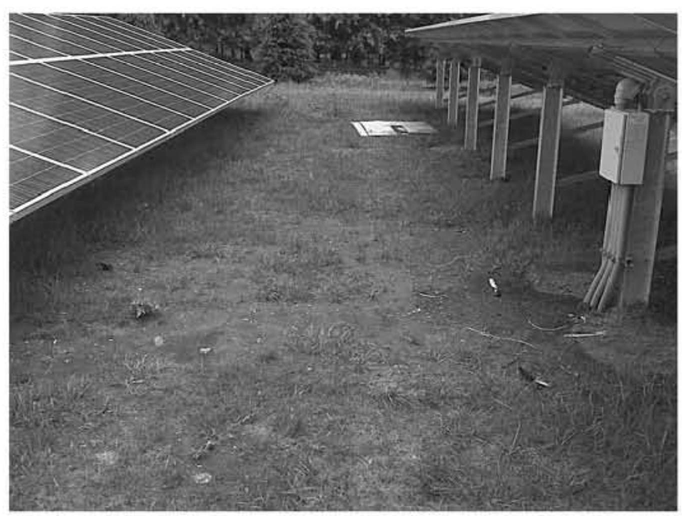

Fig. 5. Site showing the initiation of bare ground below the panels, which increases the potential for erosion (photo by John Showler, reprinted with permission)

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moves downgradient. With the spacer section as bare ground, the peak discharge increased by 100%, which reflected the increases in volume and decrease in timing. These results illustrate the need for maintenance of the grass below and between the panels.

Design Suggestions

With well-maintained grass underneath the panels, the solar panels themselves do not have much effect on total volumes of the runoff or peak discharge rates. Although the panels are impervious, the rainwater that drains from the panels appears as runoff over the downgradient cells. Some of the runoff infiltrates. If the grass cover of a solar farm is not maintained, it can deteriorate either because of a lack of sunlight or maintenance vehicle traffic. In this case, the runoff characteristics can change significantly with both runoff rates and volumes increasing by significant amounts. In addition, if gravel or pavement is placed underneath the panels, this can also contribute to a significant increase in the hydrologic response.

If bare ground is foreseen to be a problem or gravel is to be placed under the panels to prevent erosion, it is necessary to counteract the excess runoff using some form of storm-water management. A simple practice that can be implemented is a buffer strip (Dabney et al. 2006) at the downgradient end of the solar farm. The buffer strip length must be sufficient to return the runoff characteristics with the panels to those of runoff experienced before the gravel and panels were installed. Alternatively, a detention basin can be installed.

A buffer strip was modeled along with the panels. For approximately every 200 m of panels, or 29 cells, the buffer must be 5 cells long (or 35 m) to reduce the runoff volume to that which occurred before the panels were added. Even if a gravel base is not placed under the panels, the inclusion of a buffer strip may be a good practice when grass maintenance is not a top funding priority. Fig. 6 shows the peak discharge from the graveled surface versus the length of the buffer needed to keep the discharge to prepaneled peak rate.

Water draining from a solar panel can increase the potential for erosion of the spacer section. If the spacer section is bare ground, the high kinetic energy of water draining from the panel can cause soil detachment and transport (Garde and Raju 1977; Beuselinck et al. 2002). The amount and risk of erosion was modeled using the velocity of water coming off a solar panel compared with the velocity and intensity of the rainwater. The velocity of panel

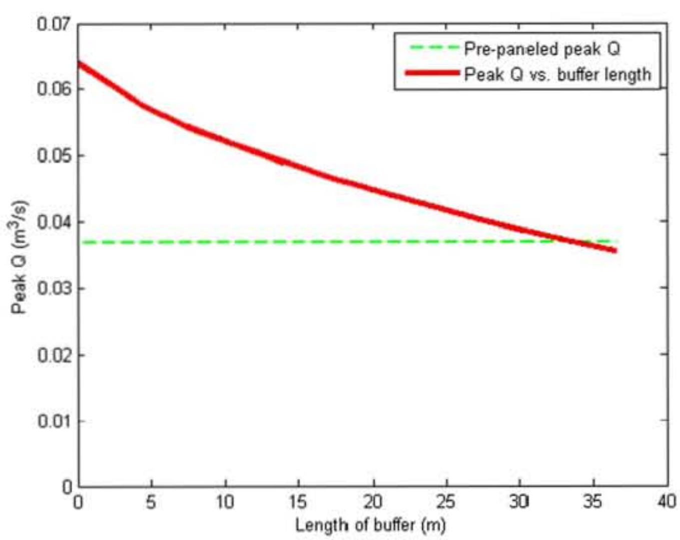

Fig. 6. Peak discharge over gravel compared with buffer length

runoff was calculated using Manning's equation, and the velocity of falling rainwater was calculated using the following:

$$V_t = 120\, d_r^{0.35} \tag{1}$$

where d_r = diameter of a raindrop, assumed to be 1 mm. The relationship between kinetic energy and rainfall intensity is

$$K_e = 916 + 330 \log_{10} i \tag{2}$$

where i = rainfall intensity (in./h) and K_e = kinetic energy (ft-tons per ac-in. of rain) of rain falling onto the wet section and the panel, as well as the water flowing off of the end of the panel (Wischmeier and Smith 1978). The kinetic energy (Salles et al. 2002) of the rainfall was greater than that coming off the panel, but the area under the panel (i.e., the product of the length, width, and cosine of the panel angle) is greater than the area under the edge of the panel where the water drains from the panel onto the ground. Thus, dividing the kinetic energy by the respective areas gives a more accurate representation of the kinetic energy experienced by the soil. The energy of the water draining from the panel onto the ground can be nearly 10 times greater than the rain itself falling onto the ground area. If the solar panel runoff falls onto an unsealed soil, considerable detachment can result (Motha et al. 2004). Thus, because of the increased kinetic energy, it is possible that the soil is much more prone to erosion with the panels than without. Where panels are installed, methods of erosion control should be included in the design.

Conclusions

Solar farms are the energy generators of the future; thus, it is important to determine the environmental and hydrologic effects of these farms, both existing and proposed. A model was created to simulate storm-water runoff over a land surface without panels and then with solar panels added. Various sensitivity analyses were conducted including changing the storm duration and volume, soil type, ground slope, panel angle, and ground cover to determine the effect that each of these factors would have on the volumes and peak discharge rates of the runoff.

The addition of solar panels over a grassy field does not have much of an effect on the volume of runoff, the peak discharge, nor the time to peak. With each analysis, the runoff volume increased slightly but not enough to require storm-water management facilities. However, when the land-cover type was changed under the panels, the hydrologic response changed significantly. When gravel or pavement was placed under the panels, with the spacer section left as patchy grass or bare ground, the volume of the runoff increased significantly and the peak discharge increased by approximately 100%. This was also the result when the entire cell was assumed to be bare ground.

The potential for erosion of the soil at the base of the solar panels was also studied. It was determined that the kinetic energy of the water draining from the solar panel could be as much as 10 times greater than that of rainfall. Thus, because the energy of the water draining from the panels is much higher, it is very possible that soil below the base of the solar panel could erode owing to the concentrated flow of water off the panel, especially if there is bare ground in the spacer section of the cell. If necessary, erosion control methods should be used.

Bare ground beneath the panels and in the spacer section is a realistic possibility (see Figs. 1 and 5). Thus, a good, well-maintained grass cover beneath the panels and in the spacer section is highly recommended. If gravel, pavement, or bare ground is

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deemed unavoidable below the panels or in the spacer section, it may necessary to add a buffer section to control the excess runoff volume and ensure adequate losses. If these simple measures are taken, solar farms will not have an adverse hydrologic impact from excess runoff or contribute eroded soil particles to receiving streams and waterways.

Acknowledgments

The authors appreciate the photographs (Figs. 1 and 5) of Ortho Clinical Diagnostics, 1001 Route 202, North Raritan, New Jersey, 08869, provided by John E. Showler, Environmental Scientist, New Jersey Department of Agriculture. The extensive comments of reviewers resulted in an improved paper.

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ONE COMPANY.
INFINITE SOLUTIONS.

April 24, 2025

Mr. Keith Morel
Ironwood Renewables
910 Harding Street
Lafayette, LA 70503

Atwell, LLC Project No. 24009016

Re: Wetland Determination/Delineation
Atticus Solar
Hillsboro Township, Montgomery County, Illinois

Mr. Morel:

Ironwood Renewables (Client) contracted Atwell, LLC (Agent) to conduct a wetland delineation, determination, and assessment for an approximately 80-acre parcel in Section 36 of Township 8 North, Range 4 West, Hillsboro Township, Montgomery County, Illinois (hereinafter referred to as "site") to support the development of a proposed solar facility. The site is located approximately 0.25 miles north of the intersection of Illinois Highway 127, and North 6th Ave. on the east side of Illinois Highway 127. Refer to the enclosed *Site Location Map*.

The purpose of the wetland determination and delineation was to determine if wetlands, watercourses, and/or bodies of water are present on the site, and to preliminarily assess if they fall under the jurisdiction of the U.S. Army Corps of Engineers (USACE).

Prior to the field survey, Atwell reviewed the following data for any ecological and environmental constraints: aerial photography, U.S. Geological Survey (USGS) 7.5-Minute Topographic Maps, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Maps, Flood Insurance Rate Maps (FIRMs) provided by the Federal Emergency Management Agency (FEMA), and county soil data from the Natural Resources Conservation Service (NRCS).

The results of the wetland delineation site visit conducted February 17 and 18, 2025, is summarized below.

Site Setting and Characteristics

A review of aerial photography and a site visit were conducted to characterize the site and surrounding area. The surrounding land use consisted of agricultural fields, residential development, commercial development, forested areas, wetland areas, small ponds, and lakes. The site itself is an active agricultural upland with a small ephemeral watercourse near the southwestern boundary, ephemeral roadside ditches traversing the length of the western boundary of the site, and several maintained narrow upland agricultural drainages traversing the site.

The site was observed to be an active agricultural area. Common herbaceous vegetation within uplands includes corn (*Zea mays*), henbit deadnettle (*Lamium amplexicaule*) and field pennycress (*Thlaspi arvense*). Herbaceous vegetation within the roadside ditch includes annual bluegrass, (*Poa* annua), switch grass (*Panicum virgatum*), and smooth brome (*Bromus inermis*).

Wetland Delineation

The wetland delineation was performed in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (USACE 2010). In areas that were observed to have "normal circumstances" wetlands were delineated utilizing on three criteria: 1) the presence of hydrophytic vegetation (plants adapted to living in saturated soils), 2) hydric soils (distinctive soil types that develop under saturated conditions), and 3) wetland hydrology (the presence of water at or near the surface for a specific period of time). Areas observed to have problematic or difficult situations were delineated utilizing the procedures identified in the Regional Supplement, Section 5 – "Difficult Wetland Situations in the Midwest Region" (USACE 2010, pp. 100-124).

In Illinois, the USACE regulates the discharge of dredged or fill material into jurisdictional wetlands and waters of the U.S. under Section 404 of the Clean Water Act (CWA). Wetlands that are hydrologically connected or adjacent to traditional navigable waters of the U. S. are regulated under Section 404. If impacts are anticipated to federally jurisdictional waters or wetlands, then a Section 404 permit obtained through review from the USACE and a Section 401 permit after review from the Illinois Environmental Protection Agency (ILEPA) would be required.

Floodplains and floodways are regulated by the Illinois Department of Natural Resources (ILDNR). All construction activities in the floodways of streams (the channel and the adjacent portion of the floodplain that is needed to safely convey and store flood waters) in urban areas where the stream drainage area is one square mile or more or in rural areas where the stream drainage area is ten square miles or more must be permitted by the ILDNR prior to construction. If impacts are anticipated to floodplains along streams with a drainage area greater than 10 square miles, then a permit would also be required from the ILDNR.

Atwell personnel conducted a wetland determination and delineation for the site on February 17 and 18, 2025 and identified two wetlands (Wetland A1 and Wetland A2) and three watercourses (Watercourse A1, Watercourse A2, and Watercourse A3) on the site. Refer to the enclosed *Wetland Location Map* for information and locations of the on-site features. Refer to the *Photographic Log* for site conditions and physical characteristics at the time of inspection. The results of the USACE Antecedent Precipitation Tool are also included as an attachment to this report.

Wetland A1 is a palustrine emergent (PEM) wetland located in the northeastern portion of the site. Wetland hydrological indicators such as surface water, saturation, sparsely vegetated concave surface and FAC-Neutral test were present at the time of inspection. Herbaceous wetland species identified within the wetland included warty panic grass (*Panicum verrucosum*; FACW) and rough cocklebur (*Xanthium strumarium*; FAC). The soils present within the wetland were a silty loam which exhibited redox dark surface, which indicated hydric soils. Wetland A1 is a small isolated shallow depression and therefore is not likely regulated by the USACE.

Wetland A2 is a PEM wetland located along the northern boundary in the western portion of the site. Wetland hydrological indicators such as surface water, saturation, oxidized rhizospheres on living roots, drainage patterns, and FAC-Neutral test. Herbaceous wetland species identified within the wetland included, warty panic grass, rough cocklebur, reed canary grass (*Phalaris arundinacea*; FACW), and switch grass (*Panicum virgatum*; FAC). The soils present within the wetland were a silty loam which exhibited redox dark surface. Wetland A2 is a narrow swale that continues off-site to the north and was identified as isolated because; it was connected to a constructed upland agricultural drainage that conveys water to Watercourse A2 within the western portion of the site. Due the length of connection through two non-relatively permanent waters (non-RPW) it is not physically close enough to meet the continuous surface connection to a downstream relative permanent tributary and consistent with Sackett, is not adjacent.

Watercourse A2 (Waveland Creek) is an ephemeral stream flowing northeast to southwest near the southwest boundary of the site. It begins on site being fed by an erosional swale which is connected fed by two constructed upland agricultural drainages, one of which is drains from Wetland A2. Watercourse A2 flows west off site through a culvert under Illinois Highway 127 where it is fed by ephemeral roadside ditches on both sides of Highway 127, becoming an intermittent feature. Due to its culverted connection to the intermittent portion of Waveland Creek, Watercourse A2 is likely regulated by USACE.

Watercourse A1 and A3 are roadside ditches. Both have a 9 to 12 inches in width with a silt substrate with small, vegetated patches at irregular intervals. Watercourse A1 flows north into a culvert then exits the site via a culvert flowing west under Highway 127. Watercourse A3 flows south into a culvert where it joins Watercourse A2 and flows west off-site through the culvert under Highway 127. Watercourses A1 and A3 are not likely regulated by the USACE.

There are several constructed and maintained upland agricultural drainages on-site. These features lack a well-defined bed and bank and appear to have been farmed through.

According to the U.S. Department of Agriculture (USDA) NRCS Web Soil Survey, the soils contained within the site have been mapped as Cowden-Piasa silt loams, 0 to 2 percent slopes (933A), Virden-Fosterburg silt loams, 0 to 2 percent slopes (885A), and Harrison silt loam silt loam, 0 to 2 percent slopes (127A). Of which the Cowden-Piasa silt loams and Virden-Fosterburg silt loams are considered hydric. Hydric soils are conducive to the growth and regeneration of hydrophytic vegetation by their ability to hold water for extended periods of time (NRCS 2010).

FEMA FIRMs were reviewed to determine if portions of the site are mapped as floodplains, floodways, or other flood prone areas. These maps record the following data: 100-year (1% chance of annual flooding) and 500-year (0.2% annual chance of flooding) floodplains, the height of the base flood elevation, and the risk to premium areas developed across a floodplain. According to FEMA FIRM panel #1709920008A, dated 01/09/1981, the site is defined as Zone X. Zone X indicates an Area of Minimal Flood Hazard. Therefore, regulated floodplains are not likely located on-site. Digital version of this mapping is not available given the date of the effective FIRM panel of 01/09/1981. The FEMA map attached to this report shows the project location and the nearest location of flood plain presence.

Conclusions and Recommendations

Based on the desktop review of online databases and a site visit, the site contains two wetlands (Wetland A1 and Wetland A2) and three watercourses (Watercourse A1, Watercourse A2, and Watercourse A3). It is Atwell's professional opinion one of the on-site watercourses, Watercourse A2, appears to meet the criteria of Section 404 under the CWA and therefore is likely regulated by the USACE.

According to FEMA FIRM panel #1709920008A, dated 01/09/1981 the site is defined as Zone X, indicating an Area of Minimal Flood Hazard. Therefore, regulated floodplains are not likely located on-site.

It is Atwell's understanding that all wetland impacts would be avoided under the current scope of the project. However, if the proposed scope of the project changes and impacts to Waters of the United States or other jurisdictional resources are anticipated a permit may be required by the USACE before any proposed work (*e.g.*, filling, dredging, construction, draining, and/or other development) that takes place within the boundaries of a regulated wetland, watercourse, lake, pond, or floodplain. The USACE has the final authority on the jurisdictional status, in addition to the extent of regulated wetlands, lakes, streams, ponds, and floodplains in the State of Illinois.

Please note that natural resource-based field work conducted out of the growing season can create seasonal constraints. Atwell recommends that delineated wetland boundaries identified out of the growing season should be field verified by Atwell personnel during the growing season for accuracy.

A permit is required by the USACE for any proposed work (*e.g.*, filling, dredging, construction, draining, and/or other development) that takes place within the boundaries of a regulated wetland, watercourse, lake, pond, or floodplain. Although most construction activities that take place outside of these boundaries do not require a permit, the USACE has the final authority on the extent of regulated wetlands, lakes, streams, ponds, and floodplains in the State of Illinois.

We appreciate the opportunity to be of service to you on this project. Should you have any questions, please contact your Atwell project manager.

Sincerely,

ATWELL, LLC

David Nigro	Don Berninger
Environmental Technician	Project Manager
Environmental Services Group	Environmental Services Group

Enclosures: Wetland Location Map
Photographic Log
Wetland Data Forms
USACE Antecedent Precipitation Tool

REFERENCES

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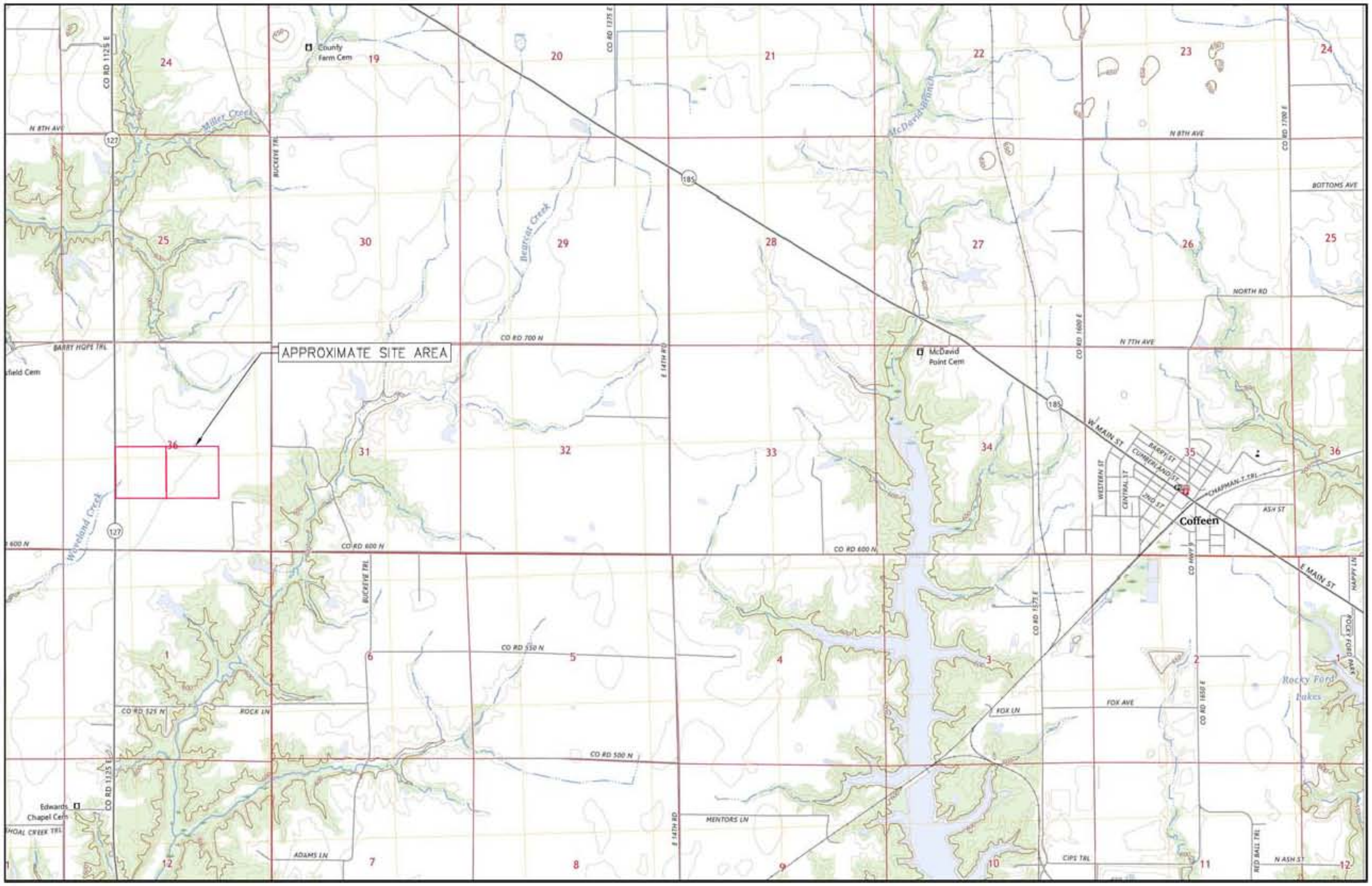

LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

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248.447.2000

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TOWN, RANGE: T08N, R04W,
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

CLIENT
ATTICUS SOLAR
HILLSBORO TOWNSHIP,
MONTGOMERY COUNTY, IL

SITE LOCATION MAP

DATE 02/20/2025

REVISIONS

SCALE:	1" = 750'
DR. NF	CH. BS
P.M.	BS
BOOK	---
JOB	24009016
SHEET NO.	01

CAD FILE: 24009016-SLM.DWG

LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

EXISTING CULVERT

EXISTING WETLAND (LIKELY NON-REGULATED)

EXISTING WATERCOURSE (CENTERLINE)

EXISTING WATERCOURSE (TOP OF BANK)

NOTE: THIS ILLUSTRATION IS AN APPROXIMATE DEPICTION OF THE WETLANDS THAT APPEAR TO BE LOCATED ON THE SUBJECT PROPERTY AS DELINEATED BY ATWELL ON FEBRUARY 18TH, 2025. USACE HAS THE FINAL AUTHORITY ON THE EXTENT OF REGULATED WETLANDS, LAKES, AND STREAMS IN THE STATE OF ILLINOIS.

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HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

CLIENT
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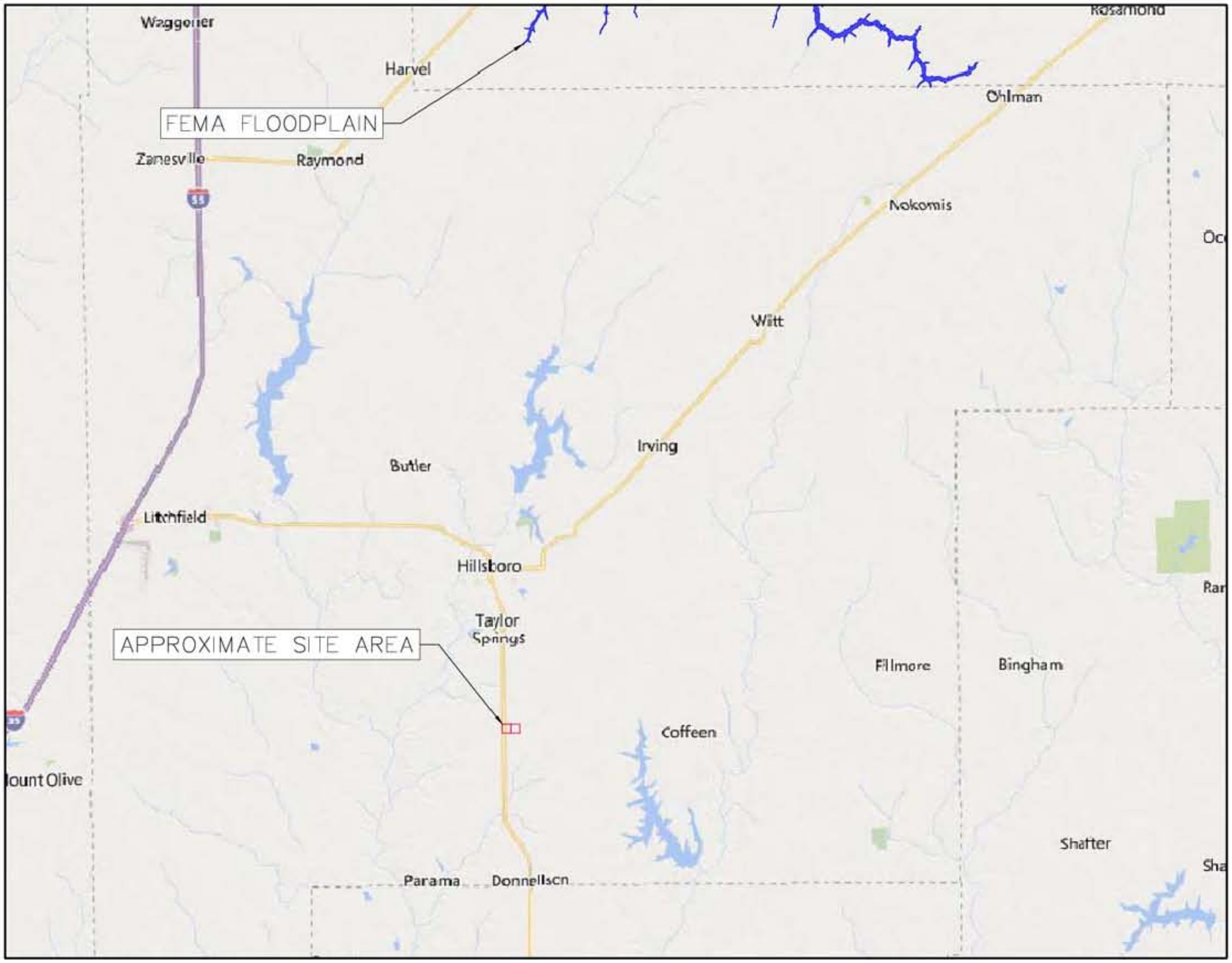
HILLSBORO TOWNSHIP,
MONTGOMERY COUNTY, IL
WETLAND LOCATION MAP

DATE 02/19/2025

REVISIONS
SCALE: 1"=150'
DR. NF | CH. BS
P.M. BS
BOOK —
JOB 24009016
SHEET NO. 01

CAD FILE: 24009016-WLM.DWG



LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

FEMA FLOODPLAIN

NOTE: NO FEMA FLOODPLAIN DATA AVAILABLE FOR MONTGOMERY COUNTY, ILLINOIS.

811 Know what's below. Call before you dig.

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SECTIONS: 36
TOWN, RANGE: T08N, R04W;
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, MICHIGAN

CLIENT: ATTICUS SOLAR
HILLSBORO TOWNSHIP, MONTGOMERY COUNTY, MI
FEMA FLOODPLAIN MAP

DATE: 04/23/2025

REVISIONS

SCALE: 1"=7500'

DR. ZE CH. BS
P.M. DB
BOOK ---
JOB 25001794
SHEET NO. 01

PHOTOGRAPHIC LOG

Ironwood Energy - Atticus Solar

February 17 - 18, 2025 – Hillsboro Township, Montgomery County, Illinois

Photo 1. An east facing, overall view of the site showing agricultural fields.

Photo 2. A South facing view of Wetland A1. A palustrine emergent (PEM) wetland.

Photo 3. A west facing photo of Wetland A2, a PEM wetland.

Photo 4. A South facing view of Watercourse A1 (upstream). A roadside ditch.

Photo 5. An east facing photo of Watercourse A2. Ephemeral headwaters of Waveland Creek.

Photo 6. A North facing view of Watercourse A3 (upstream). A roadside ditch.

Photo 7. A south facing view of a typical upland agricultural drainage found on site.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Atticus Solar City/County: Montgomery County Sampling Date: 2025-02-18

Applicant/Owner: Ironwood Renewables State: Illinois Sampling Point: WL A1_u

Investigator(s): Dave Nigro Section, Township, Range: sec 36 T008N R004W

Landform (hillslope, terrace, etc.): Talf Local relief (concave, convex, none): None

Slope (%): 0-2 Lat: 39.093027 Long: -89.478340 Datum: WGS84

Soil Map Unit Name: Cowden-Piasa silt loams, 0 to 2 percent slopes NWI classification: None

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.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?		✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:
Data point does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Lamium amplexicaule	20	Y	UPL
2. Thlaspi arvense	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	25.0 = Total Cover		
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
	0 = 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: 0.00 (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	20	x 5 = 100
Column Totals:	25 (A)	120.00 (B)

Prevalence Index = B/A = 4.8

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.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)
Past season corn stubble present
Hydrophytic vegetation criterion not met

SOIL

Sampling Point: WL A1_u

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 3/2	100						
10-20	10YR 3/2	90						
	10YR 4/4	10						

[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)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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:

Hydric soil indicators not met

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ 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)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______________

Water Table Present? Yes ______ No ✓ Depth (inches): ______________

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______________

Wetland Hydrology Present? Yes ______ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Incipient wetness, Wet Season, Drier than Normal.

Remarks:

Hydrology criterion not met

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Atticus Solar City/County: Montgomery County Sampling Date: 2025-02-18

Applicant/Owner: Ironwood Renewables State: Illinois Sampling Point: WL A1_w

Investigator(s): Dave Nigro Section, Township, Range: sec 36 T008N R004W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 39.092997 Long: -89.478284 Datum: WGS84

Soil Map Unit Name: Cowden-Piasa silt loams, 0 to 2 percent slopes NWI classification: None

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 ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:
3/3 criteria met area sampled is a wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Xanthium strumarium	5	Y	FAC
2. Panicum verrucosum	2	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	7.0 = Total Cover		
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
	0 = 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: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	7 (A)		19.00 (B)

Prevalence Index = B/A = 2.71

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.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criterion met, center of depression less than 5% vegetated. Meets hydrophytic vegetation criterion

SOIL

Sampling Point: WL A1_w

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
0-7	10YR 2/2	100					SL	
7-16	10YR 2/2	95	10YR 3/6	5	C	M	SL	
16-20	10YR 3/1	90	10YR 5/6	10	C	M	SL	

[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)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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:

Hydric soil indicator met

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)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ 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)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ______	Depth (inches): 1
Water Table Present?	Yes ✓	No ______	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✓	No ______	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✓ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Incipient wetness, Wet Season, Drier than Normal.

Remarks:

Hydrology criterion met

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Atticus Solar City/County: Montgomery County Sampling Date: 2025-02-18

Applicant/Owner: Ironwood Renewables State: Illinois Sampling Point: WL A2_u

Investigator(s): ______ Section, Township, Range: sec 36 T008N R004W

Landform (hillslope, terrace, etc.): Talf Local relief (concave, convex, none): None

Slope (%): 0-2 Lat: 39.093234 Long: -89.485360 Datum: WGS84

Soil Map Unit Name: Virden-Fosterburg silt loams, 0 to 2 percent slopes NWI classification: None

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 ✓
Hydric Soil Present?	Yes ___	No ✓
Wetland Hydrology Present?	Yes ___	No ✓

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:
Data point does not meet wetland criteria.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
	0 = 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	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	0	x 3 = 0
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	0 (A)	0.00 (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.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criterion not met

SOIL

Sampling Point: WL A2_u

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	10YR 3/2	100						
12-18	10YR 3/2	95	10YR 3/6	5	C	M	SIL	
18-22	10YR 3/1	95	10YR 5/4	5	C	M/PL	SIL	

[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)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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:

Hydric soil indicators not met

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ 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)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ______ No ✓ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ✓ Depth (inches): ______

Wetland Hydrology Present? **Yes** ______ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Incipient wetness, Wet Season, Drier than Normal.

Remarks:

Hydrology criterion not met

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Atticus Solar City/County: Montgomery Co. Sampling Date: 2025-02-18

Applicant/Owner: Ironwood Renewables State: Illinois Sampling Point: WL A2_w

Investigator(s): ______ Section, Township, Range: sec 36 T008N R004W

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 39.093295 Long: -89.485306 Datum: WGS84

Soil Map Unit Name: Virden-Fosterburg silt loams, 0 to 2 percent slopes NWI classification: None

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 ___
Hydric Soil Present?	Yes ✓	No ___
Wetland Hydrology Present?	Yes ✓	No ___

Is the Sampled Area within a Wetland? Yes ✓ No ___

Remarks:

PEM swale in an actively farmed field
3/3 criteria met area sampled is a wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Panicum verrucosum	10	Y	FACW
2. Phalaris arundinacea	10	Y	FACW
3. Panicum virgatum	5	N	FAC
4. Xanthium strumarium	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	30.0 = Total Cover		
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
	0 = 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:	100.00	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	20	x 2 = 40
FAC species	10	x 3 = 30
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	30 (A)	70.00 (B)

Prevalence Index = B/A = 2.33

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.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation criterion met.

SOIL

Sampling Point: WL A2_w

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 2/2	100						
6-10	10YR 2/2	90	10YR 3/6	10	C	M	SIL	
10-20	10YR 3/1	80	10YR 5/4	10	C	M/PL	SIL	
	10YR 2/2	10					SIL	

[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)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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:

Hydric soil indicator met

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)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ 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)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 1

Water Table Present? Yes ✓ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

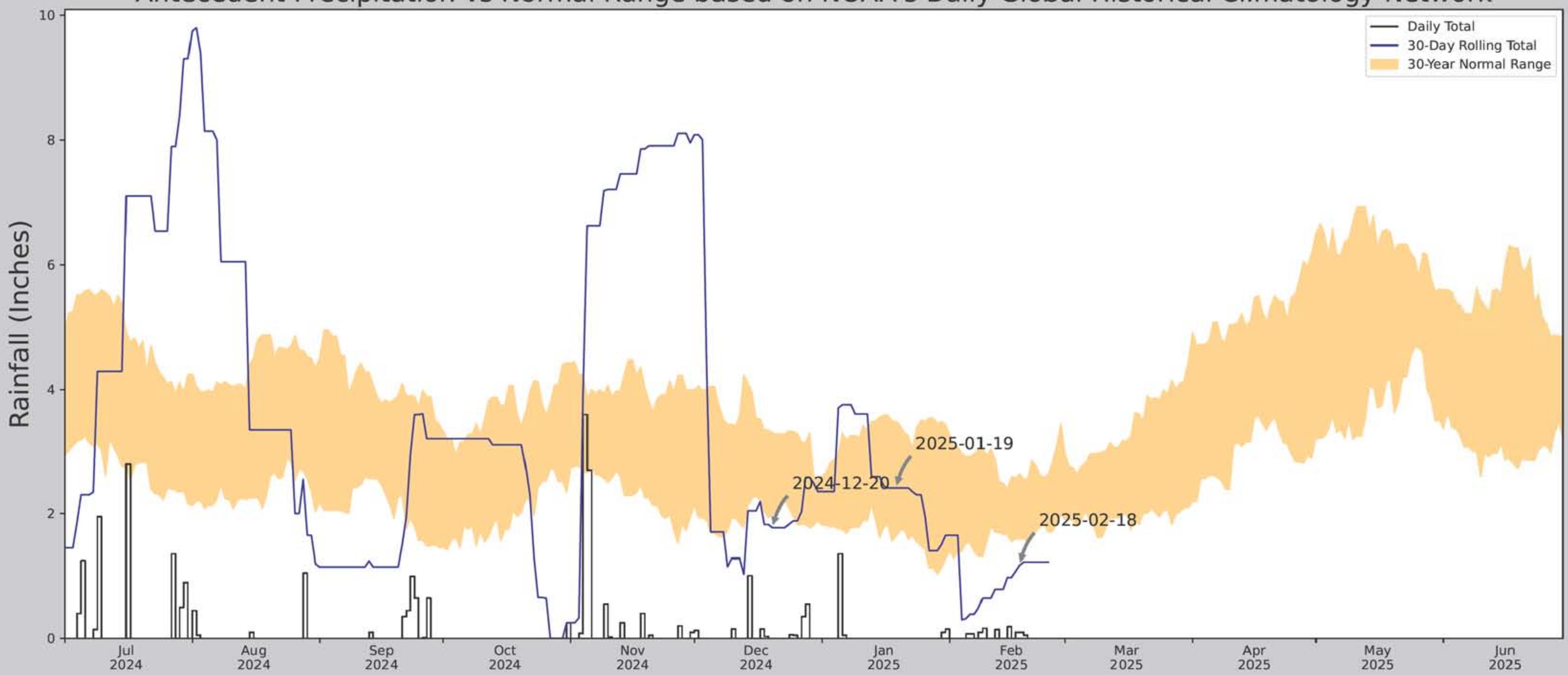
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Incipient wetness, Wet Season, Drier than Normal.

Remarks:

Hydrology criterion met

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	39.091700, -89.482368
Observation Date	2025-02-18
Elevation (ft)	619.017
Drought Index (PDSI)	Incipient wetness (2025-01)
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
2025-02-18	1.591732	2.638583	1.177165	Dry	1	3	3
2025-01-19	1.63937	3.489764	2.413386	Normal	2	2	4
2024-12-20	1.988976	3.304331	1.771654	Dry	1	1	1
Result							Drier than Normal - 8

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
HILLSBORO	39.1611, -89.4919	629.921	4.822	10.904	2.223	9789	84
LITCHFIELD 0.8 SE	39.1696, -89.644	679.134	8.169	49.213	4.078	18	0
LITCHFIELD 0.2 SE	39.1737, -89.6541	688.976	8.732	59.055	4.445	465	0
LITCHFIELD 5.8 NNE	39.2554, -89.6235	654.856	9.596	24.935	4.557	22	0
MT OLIVE 1 E	39.0728, -89.7014	669.948	12.781	40.027	6.263	1036	4
NOKOMIS 4.5 NW	39.347, -89.3455	643.045	15.044	13.124	6.967	21	0
EAGARVILLE 0.2 S	39.1077, -89.7841	638.123	16.089	8.202	7.372	0	2
MORRISONVILLE	39.4158, -89.4614	629.921	17.674	0.0	7.953	2	0

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

IRONWOOD RENEWABLES

Exhibit M: Structural Engineer's Geotechnical Report

GEOTECHNICAL REPORT

Atticus Solar, LLC
Hillsboro, Illinois

May 1, 2025

LICENSED PROFESSIONAL ENGINEER
VATSAL SHAH
062-073909
OF ILLINOIS
05/01/2025

Vatsal Shah, Ph.D, PE
Principal Engineer
IL PE No. 062073909

Kyle Knight, PG
Project Geologist

ANS GEO

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Executive Summary

ANS Geo, Inc. is pleased to provide this Geotechnical Report (Report) to Atticus Solar, LLC (Atticus Solar) for the proposed Atticus Solar project located in Hillsboro, Illinois. We understand that the project is proposed with a site area of approximately 30 fenced-in, buildable acres.

The purpose of this geotechnical investigation was to inform early-stage planning and design, as well as high-level constructability considerations such as trenchability and pile driveability using conventional means. ANS Geo has summarized, at a very high level, some of the critical observations which may impact project design and construction based on our observations during the geotechnical investigation. While the items are summarized below, the reader is cautioned that this Executive Summary does not replace the detailed recommendations contained in each Section.

1. ANS Geo advanced four (4) soil borings within the proposed solar array areas to a depth range from 18.9 to 20 feet below ground surface (BGS) and two (2) test pits to a target depth of 10 feet BGS. ANS Geo also completed two (2) field Electrical Resistivity Tests (ERTs) along with various lab testing including California Bearing Ratio (CBR), thermal resistivity, corrosion, and soil index testing An Investigation Location Plan is provided within **Attachment A.**

2. The encountered soils observed were predominantly medium stiff clay with various amounts of silt and sand content. After approximately six (6) feet below grade, silt became the predominant soil type, while clay content decreased and coarse to fine sand content increased. Auger refusal was not encountered during our field investigation, but split spoon refusal was encountered within three (3) of the four (4) borings. Split spoon refusal occurred at depths ranging from 18.9 to 20 feet BGS. A detailed description of encountered subsurface conditions and lab test results are summarized in **Section 3**, and **Section 4**, respectively. All boring logs, test pit logs, and lab test results are provided in **Attachment C, Attachment D,** and **Attachment E**, respectively.

3. Groundwater was not encountered at any of the soil borings but it was encountered in the test pits from 7.5 to 8 feet below grade during the specific time of our investigation. It should be noted that seasonal variation may cause fluctuations in the groundwater table, alongside the possible presence of perched groundwater.

4. Ad-freeze is expected at this site for driven PV posts and buried shallow foundations. ANS Geo has recommended an ad-freeze depth of **20-inches** (1.67 feet) assuming vegetative cover will be maintained across the areas where array foundations will be installed, along with an ad-freeze stress of 1,500 psf within this depth. All other foundations (such as inverters and pads) should be installed with turn-downed slabs or bottom of foundation to a minimum frost penetration depth of **24-inches** (2.0 feet).

5. California Bearing Ratio (CBR) laboratory testing yielded a value of 2.3%, Based on the assumptions outlined in **Section 7.5**, after proof-rolling and subgrade preparation, unreinforced aggregate access roadways should be designed for post-construction traffic conditions to include at least 9 to 12 inches of compacted crushed stone for two-inch rutting allowance for 3,000 and 10,000 ESAL loads respectively. This aggregate thickness can be reduced with the use of geotextile separation between stone and subgrade or with the additional use of Class 2 or better geogrid or with chemical stabilization of subgrade soils.

6. Based on corrosivity laboratory testing and field electrical resistivity testing, the in-situ soil conditions generally indicate soils that can be considered "**corrosive to highly corrosive**". It is anticipated that appropriate protective measures for buried steel such as standard galvanic coating or sacrificial steel will be employed to manage this corrosion, which is typical of PV projects.

1 Project Introduction

ANS Geo, Inc. (ANS Geo) is pleased to provide this Geotechnical Report to Atticus Solar LLC, to summarize the results of our geotechnical investigation program for the proposed Atticus Solar Project located in Hillsboro, Illinois. We understand that the project will consist of photovoltaic arrays with supporting ancillary structures and will occupy approximately 30 buildable acres. A map showing the location of the proposed project with respect to the surrounding region is provided as **Figure 1**.

The project area is located approximately four (4) mile south of the town of Hillsboro, Illinois. The site is bounded to the north, east, and south by agricultural land and bounded to the east by Country Road 1125 E. Our review of historical satellite and aerial photography indicates that the site has remained in its current configuration without other apparent site uses since at least April 1998.

Figure 1: Project Vicinity Map

Source: Google Earth Imagery dated 11/2023.

ANS Geo, in consultation with and approval from Atticus Solar LLC, developed a geotechnical investigation program which was implemented by ANS Geo in March and April 2025 to help support the design and construction of the proposed solar facility.

ANS Geo's geotechnical investigation program included soil borings, test pit excavations, in-situ electrical resistivity testing across solar arrays, as well as an engineering evaluation to provide foundation recommendations and constructability information of existing soils for the proposed development. Our work also included laboratory soil index testing, thermal resistivity testing for grounding and in-ground electrical cable design, corrosion testing to evaluate the potential of the native soils for corrosion to buried steel and concrete, and California Bearing Ratio (CBR) for access road design. An as-completed investigation location plan is provided within **Attachment A.**

2 Methodology

2.1 Soil Borings

ANS Geo advanced four (4) soil borings (B-01 to B-04) at select locations across the project area on April 1st, 2025. All borings were advanced within the proposed array area. The soil boring locations are depicted in the Investigation Location Plan, provided as **Attachment A.**

The four array-area soil borings were advanced to approximately 20 feet below ground surface (BGS), where three of the borings encountered split spoon refusal at a depth range from 18.9 to 19.9 feet BGS. A Diedrich D-70 track drill rig was used to collect soil samples using the Standard Penetration Test (SPT) Method through solid-stem augers in accordance with ASTM Standard D1586. Soil samples were collected continuously within the upper 10 feet in each boring, then in five-foot intervals thereafter to the termination depth. Soil boring locations, proposed by ANS Geo and confirmed by Ironwood Renewables for review, were located at relatively evenly spread locations throughout the project's array areas. All soil borings were overseen and logged by an ANS Geo representative under the direction of a Professional Engineer licensed in the State of Illinois. Soil boring logs are presented as **Attachment C.**

At select soil boring locations, auger cuttings were collected 0 to 5 feet below grade with the purpose of obtaining bulk soil samples for laboratory California Baring Ratio (CBR), thermal resistivity testing (TRT) and corrosivity testing. Upon completion, each borehole was backfilled to its existing grade with soil cuttings.

2.2 Test Pits

ANS Geo advanced two (2) test pits (TP-01 through TP-02) at locations distributed across the project site on April 23rd, 2025. The location of each test pit advanced is depicted in the Investigation Location Plan provided within **Attachment A**. Each test pit was excavated using a Takeuchi TB 145 excavator down to proposed depth of 10 feet below existing grade. All test pits were overseen and logged by an ANS Geo representative under the direction of a Professional Engineer licensed in the state of Illinois. Soil strata changes, soil classification, water levels and excavation depths were documented during each test pit excavation and are presented within the test pit logs provided as **Attachment D**.

Upon completion, each test pit excavation was backfilled with native soil cuttings, bucket-tamped, and driven over several times with the backhoe to minimize any post-excavation settlement.

2.3 Electrical Resistivity Testing

As part of our field investigation program, ANS Geo completed field Electrical Resistivity Testing (ERT) at two (2) locations within the proposed array areas on March 26th, 2025.

In-situ soil resistivity measurements were obtained by utilizing the Wenner 4-Pin Method in accordance with ASTM G57 and IEEE Standard 81. Two mutually perpendicular traverses were collected at each ERT location. The ERTs located within the array area were completed using "a" spacings of 2, 5, 10, 25, and 50 feet. Completed ERT data is presented in **Attachment F**.

3 Geology, Surface, and Subsurface Conditions

ANS Geo conducted a brief, desktop review of surficial and bedrock geology maps and reports made available by the United States Geological Survey (USGS), Illinois State Geological Survey (ISGS), Federal Emergency Management Agency (FEMA), and the USDA's Natural Resources Conservation Service (NRCS).

3.1 Historic & Topographic Setting

Based on USGS topographic mapping, the project site is located entirely within the Coffeen Quadrangle (2015). The elevation across the site generally ranges from 617 feet above mean sea level (AMSL) to 622 feet AMSL.

3.1.1 Regional Mining Background

ANS Geo conducted an initial desktop review to identify areas of historic mining activity within and around the project boundary. According to publicly available maps from the Illinois Coal Mine Viewer by the University of Illinois Urbana-Champaign, there are no coal mines mapped within the project area. However, there are several coal mines mapped near the project within Montgomery County. Deer Run Mine is located 0.64 miles northeast of the project boundary. Deer Run Mine is an active longwall mine operated by Patton Mining, LLC since 2010. Total known production since 2010 is greater than 25,000,000 tons of coal. This operation utilizes the Mechanical Longwall method that combines traditional Longwall mining with the Room-and-Pillar method. The main entries of the mine, and panel areas use the Room-and-Pillar method to reduce the risk for ground subsidence. Traditional longwall mining presents a high risk of subsidence since all coal is removed during longwall mining, and replaced with wood supports. Over time, overlaying rock settles on the supports causing subsidence. Room-and-Pillar mining leaves pillars of unmined coal for stability, reducing subsidence risk.

The Indiana and Illinois No. 15 mine is located 2.3 miles northwest of the project site. This mine is an abandoned room and pillar mine that was operated by the Indiana and Illinois Coal Corporation between 1919 and 1923. This mine previously operated as the Taylor Spring mine (Montgomery County Coal Company 1908-1912), Peabody No. 15 (Peabody Coal Company 1912-1915), C. and E.I. No. 15 (C. and E.I. Coal Properties 1917-1918), Illinois Coal Properties No. 15 (Illinois Coal Properties 1918-1919). During the years of production (1908-1923), the mine produced 3,323,746 tons of coal. This operation utilized the Room-and-Pillar method, where coal is partially mined, leaving large pillars of coal intact to support the overlying rock.

Table 1: Historical Mines near Atticus Solar, LLC

Mine Name	Operator	Status	Coal Seam	Seam Thickness (ft)	Type	Depth BGS (ft)	Distance From Site (Miles)
Deer Run Mine	Patton Mining, LLC	Active	Herrin	6.5-10.0	Mechanical Longwall	500	0.64
Indiana and Illinois No.15	Indiana and Illinois Coal Corp.	Abandoned	Herrin	6.0-8.0	Room and Pillar	450-471	1.7

3.2 FEMA Flood Zones

Based on available mapping of Montgomery County, there are no 100-year floodplain areas mapped within the project boundary. This location of Montgomery County is designated by FEMA as an Area of Minimal Flood Hazard.

Based on existing site topography and ANS observations during geotechnical field exploration, overall flood hazard potential can be considered a low risk for this project site. Civil engineering design should evaluate the final site grading plan and assess any flood risk or drainage considerations. The design of flood-proofing as well as scour/erosion protection, if required, is the responsibility of the project Civil Engineer or Hydrology Engineer.

3.3 Surficial Geology

The NRCS survey was initially created for agricultural purposes and is generally limited to the upper five feet BGS; however, the resource provides generalized information pertaining to soil chemistry and properties. The NRCS mapping identifies 99.0% Cowden-Piasa silt loams and 1.0% Virden-Fosterburg silt loams. Both the Cowden series and the Piasa consists of very deep, poorly drained soils. The Cowden series is formed in loess on broad upland plains while the Piasa series is formed in loess and the underlying till on broad, nearly level interfluves on the Illinoian till plain. Both these series have very slow permeability. The Virden series consists of very deep, poorly drained, moderately slowly permeable soils formed in loess on nearly level summits on till plains. The Fosterburg series consists of very deep, poorly drained, slowly permeable soils formed in loess on nearly level or depressional parts of broad interfluves on till plains. The full NRCS soil report is provided as **Attachment H**.

3.4 Bedrock Geology

ANS Geo reviewed geologic mapping made available by the United States Geological Survey (USGS), Coffeen Quadrangle (2015) which indicates the project area is mapped within the Bond Formation from the Pennsylvanian period. This formation primarily consists of sandstone, shale, and limestone, with minor coal constituent members.

3.5 Regional Karst

According to publicly available USGS data, the project boundary is not mapped in an area with observed karstic features in limestone. In addition to our on-site assessment and regional maps, we conducted limited research on publicly available sinkhole data from the Illinois State Geological Survey. Mapped sinkholes were not observed within the project site. The nearest sinkhole from the project boundaries is estimated to be approximately around 38 miles southwest of the project boundary, near Alton, Illinois. Based on the review of publicly available information and results of our field investigation, it is our opinion that there is a low to negligible risk of significant karst activity at the project site.

3.6 Mining Risk

Based on our desktop evaluation, the records of historic mining activities indicate that there is not a significant risk of subsidence to photovoltaic (PV) arrays and inverters in the project area. The available mining record indicate that the nearest mines were located 0.64 and 1.7 miles from site. These mines both targeted the Herrin seam at depths of approximately 450 to 500 feet below grade. The Deer Run Mine is currently active and utilizes the Mechanical Longwall method. Traditional longwall mining presents a high risk for subsidence as 100 percent of the coal is extracted, leaving only wood supports in place of the extracted coal. Over time, the overlaying rock settles or collapses on these supports, creating subsidence. Mechanical Longwall mining seeks to reduce subsidence risk by implementing the Room-and-Pillar method at mine entrances and panel areas to provide structural support. The Indiana and Illinois No. 15 Mine Utilized the Room-and-Pillar method. Typically, risk related to mine-related subsidence for Room-and-Pillar mines is expected to be low. We did not encounter any noticeable depression or recorded sinkholes within the project area or the vicinity. It should be noted that our observations are not an exhaustive study of such risk. In some instances, deep seated faults or solution cavities may not necessarily be manifested at the surface or hidden by other surficial features such as vegetation covers. In high-risk areas, geophysical study and/or additional geotechnical investigation may be considered for risk assessment.

Differential settlement due to poorly compacted fill, or mine spoil is not anticipated within the project site, as underground mining is not mapped within the project area. However, should these conditions be encountered; foundations within the PV array areas are generally driven wide-flange posts, which are lightly-loaded structures and can bypass some of the unsorted and uncontrolled mine backfill based on their embedment into the ground. The potential for settlement due to these structures is also generally low and within the typical tolerance of the racking systems for these structures. Unlike PV array areas, however, inverters face a slightly larger concern due to their increased sensitivity to loading and settlement, and heavier imposed bearing pressures to the ground. If excessive settlement of the backfilled mine were to occur, this would cause total or differential settlement outside of manufacturer tolerances, or cause impacts to buried cabling, connections, and conduits. Should imposed bearing pressures be higher than the provided recommendations, foundation types or installation methods should be considered to assist in the reduction of post-construction settlement of the reclaimed surface mine spoils. This can include surcharging/pre-loading the soil in the area of the inverters by matching the proposed bearing pressures, the use of deep foundations (such as driven piles, helical piles, or similar), or over-excavation and replacement of soil with properly-compacted structural fill

Overall, risk due to historic mining activities is considered low for the project area, however, if local pseudo karst features or subsidence are observed during construction, additional geotechnical and/or geophysical investigation for delineation of high-risk area and necessary mitigation measures may be required.

3.7 Observed Subsurface Conditions

ANS Geo has provided a generalized description of subsurface conditions and a borehole summary table as **Table 2** and **Table 3** below based on the observations made during our geotechnical investigation. ANS Geo notes that this profile is highly generalized, and that soil boring logs and test pit photo logs have been provided as **Attachment C** and **Attachment D**, respectively, and should be reviewed for location specific soil condition observations.

Table 2: Generalized Subsurface Profile

Stratum	Avg. Depth (ft)	Material (USCS)	Avg. Consistency/ Relative Density	Description
--	0 ~ 0.1	Topsoil	---	Given the site's history of agricultural use, a surficial layer of highly organic topsoil should be anticipated throughout the project boundary. Topsoil thickness ranged from 1 to 3 inches in our borings and test pits. There may be areas where depth of topsoil is greater than encountered at our investigation points.
I	0.1 ~ 6	Clay (CL)	Medium Stiff	The uppermost stratum consists of brown to gray clay with varying silt content. Coarse to fine sand was present throughout this layer in small quantities. Mottling was observed within all 4 borings in this layer. Standard penetration test N-values ranged from 4 to 7 blows per foot (bpf) with an average value of 5.4 bpf within this layer. Pocket Penetrometer values ranged from 0.5 to 2.0 tsf, with an average value of 1.4 tsf.
II	6 ~ 10	Silt (ML)	Medium Stiff	This strata consisted of medium stiff brownish yellow to gray silt. The clay content decreased while the coarse to fine sand content increased. Mottling was observed within all 4 borings in this layer. Standard penetration test N-values ranged from 4 to 5 bpf with an average value of 4.5 bpf within this layer. Pocket Penetrometers ranged from 0.5 to 1.5 tsf for with an average value of 1.0 tsf.
III	10 ~ 20	Silt (ML)	Stiff to Hard	This layer consisted of stiff to hard gray silt with variable clay content. There was a notable increase in both coarse to fine gravel and sand content. Mottling was observed in 1 boring within this layer. Splitspoon refusal was encountered between 18.9 and 19.9 feet below ground surface in 3 of the 4 borings. The standard penetration test N-values ranged from 13 to greater than 50 bpf with an average value of 38.3 bpf within this layer. Pocket Penetrometers ranged from 1.5 to 4.5 tsf with an average value of 4.0 tsf.

Table 3: Investigation Summary Table

Location ID	Coordinates	Termination Depth (ft)	Depth to Groundwater (ft)
Boreholes			
B-01	39.09128°N, 89.48664°W	18.9	N/A
B-02	39.09004°N, 89.48453°W	19.9	N/A
B-03	39.09120°N, 89.48253°W	20.0	N/A
B-04	39.09002°N, 89.48057°W	18.9	N/A
Test Pits			
TP-01	39.09020°N, 89.48630°W	9.7	8.0
TP-02	39.09119°N, 89.48085°W	10	7.5

"N/A" = Rock or groundwater was not observed within any investigation location depth explored

3.8 Groundwater Conditions

At the time of our investigation, groundwater was not observed in the borings, but it was observed in both of the test pits conducted between 7.5 and 8.0 feet below grade. Due to the low permeability of the soils encountered in the borings, a relatively long period of time may be necessary for a groundwater level to develop and stabilize in a borehole in these materials. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the borings and test pits were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be observed.

4 Laboratory Results

Representative soil samples were collected during our investigation and submitted to ANS's accredited materials testing laboratory.

4.1 Soil Index Testing

A summary of the index laboratory test results has been provided within **Table 4** and **Table 5**. As-received laboratory test results are included within **Attachment E**.

Table 4: Soil Index Testing Summary (Sieve Analysis, ASTM D6913)

Location ID	Sample ID	Depth (ft)	% Gravel	% Sand	% Fines	% Moisture
B-02	S-6	13 – 15	3.9	46.9	49.2	9.7

Table 5: Soil Index Testing Summary (Atterberg Limits, ASTM D4318)

Boring ID	Sample ID	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	% Moisture	USCS
B-01	S-3	4 – 6	33	21	12	21.9	CL
B-02	S-4	6 – 8	31	20	11	22.8	CL
B-03	S-5	8 – 10	29	19	10	19.6	CL
B-04	S-2	2 – 4	45	23	22	25.8	CL

4.2 Thermal Resistivity Testing

ANS Geo collected bulk samples from one (1) location within the project area from three (3) to five (5) feet below grade for laboratory testing of Thermal Resistivity. Soil was collected in a five-gallon bucket and delivered to ANS's accredited laboratory for testing. The soil was compacted to 85 percent of its Standard Proctor Density in accordance with ASTM D698, and Thermal Resistivity Testing was conducted in accordance with ASTM D5334 and applicable IEEE Standards. Results of the thermal testing are summarized within **Table 6**. Complete, as-received results are provided within **Attachment E**.

Table 6: Thermal Resistivity Testing Summary (ASTM D5334)

Location ID	Material Type	Thermal Resistivity Values at Various Moisture Contents						Received Moisture Content (%)	Re-Molded Dry Density (pcf)
		% water	% water	% water	% water	% water	% water		
		(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)	(°C-cm/W)		
B-02	Clay & Silt	0.0	3.6	7.2	10.7	14.3	27.9	27.9	88.7
		208.9	**174.3**	**112.2**	**89.8**	**82.1**	**74.2**		

4.3 Corrosivity Testing

ANS Geo collected samples from zero (0) to five (5) feet below grade at two (2) locations for corrosivity testing. The results of the testing, completed by ANS Geo's lab, have been summarized within **Table 7** and are detailed within **Attachment E**.

Table 7: Corrosivity Testing Summary

Location ID	pH	Sulfate (mg/kg)	Chloride (mg/kg)	Redox Potential (average) (mV)	Soil Box Resistivity (Ω-cm)
B-03	6.3	60	192	294	1,370
B-04	5.8	60	171	303	1,190

4.4 California Bearing Ratio

ANS Geo collected a bulk sample from 1 to 3 feet BGS at location B-03 for California Bearing Ratio (CBR) testing per ASTM D1883 at **95 percent** Standard Proctor Density (ASTM D698). The results of the testing have been summarized within **Table 8**.

Table 8: California Bearing Ratio Summary

Boring ID	CBR Ratio (%)
B-01	2.3

5 Seismic Site Considerations

Based on the observations from our subsurface investigation program and our familiarity with the project area, Site **Class D** is assumed as the average condition across the project site for Risk Category II.

The following Site **Class D** (stiff soil) seismic ground motion values were obtained from the USGS Seismic Hazard Maps, referenced in ASCE 7-22 Standard, for this site:

- 0.2 second spectral response acceleration, S_S= 0.50 g
- 1 second spectral response acceleration, S_1= 0.16 g
- Maximum spectral acceleration for short periods, S_{MS}= 0.56 g
- Maximum spectral acceleration for a 1-second period, S_{M1}= 0.33 g
- 5% damped design spectral acceleration at short periods, S_{DS}= 0.37 g
- 5% damped design spectral acceleration at 1-second period, S_{D1}= 0.22 g
- Peak Ground Acceleration PGA_M= 0.25 g
- Seismic Design Category SDC= D

5.1 Preliminary Seismic Evaluation

The designated seismic site class is anticipated based on results from our investigation program and using select areas of the site which have been investigated by ANS Geo. Seismic support data is provided as **Attachment G**. Based on our observation of subsurface conditions, estimated Site Class ratings, and review of USGS's 2023 National Seismic Hazard Map, ANS Geo concludes that there is a low risk of significant seismic activity which may impact the proposed solar facility. Since the project site is located in a low to medium-risk seismicity area and the encountered soils are generally fine grained, the liquefaction risk is considered low.

6 Foundation Considerations

ANS Geo anticipates that, as typical with solar farm construction, embedded posts, such as W6x9 H-piles, will be used to support the proposed solar panels. Conventional shallow foundations such as sonotubes, spread footings, or similar systems may also be utilized for equipment pads and associated support structures.

6.1 Corrosion Considerations

6.1.1 Buried Steel

Given the available testing results measuring the soil pH level, sulfate and chloride concentrations, resistivity, and redox potential summarized in in **Section 4.3 (Table 7),** in consideration with the soil and moisture conditions observed, the in-situ soil conditions generally indicate soils that may be considered, on average, "**Corrosive to Highly Corrosive**" to ferrous material. Therefore, it is anticipated that scarified steel thickness or hot dipped galvanized steel with a minimum zinc coating thickness in accordance with ASTM A123 should be specified to provide allowance for corrosion loss over the project design life. For structural steel shapes, a minimum zinc coating thickness typically ranges from 3-mil to 5-mil depending on the steel section size as specified by ASTM A123. For example, a W6x9 shall contain a minimum zinc coating grade of 75 micrometers, or a 3-mil thick coating.

Steel section loss in piles decreases the structural load carrying capacity of the member as well as increases the member deflections. Therefore, it is recommended that the final structural design considers the useful life of galvanized (zinc) coating, followed by the anticipated loss of steel due to corrosion to ensure the structural integrity is maintained throughout the service life. Thicker pile sections, increased zinc coating thickness, or other corrosion protection measures may be necessary to accommodate any reduction in structural capacity. For example, it is possible that a W6x12 pile with a standard zinc coating thickness could corrode to W6x9-equivalent section throughout the service life depending on the corrosion-related soil properties.

ANS Geo conducted a site-specific corrosion evaluation which consisted of reviewing the corrosivity data collected at the site, along with subsurface profile (soil type), in-situ moisture content, sulfate content, chloride content, field and/or laboratory tested electrical resistivity. The purpose of our evaluation was to estimate the rate of corrosion of zinc coating and bare steel resulting from exposure to the surrounding environment, and the potential steel loss of the member sections. Below are the summarized results for soil (below grade) and atmospheric (above grade) corrosion for a 35-year design service life.

<u>**Soil Corrosion:**</u>

- **Soil corrosion induced loss of zinc (per side):**
  - **3 mil coating:** 0.455 mil/year (depletion of zinc occurs in 6.6 years)
  - **5 mil coating:** 0.223 mil/year (depletion of zinc occurs in 22.4 years)
- **Bare steel loss due to soil corrosion *after* loss of zinc (per side)**: 1.482 mil/year
  - **With 0 mil coating:** 51.9 mil (at end of 35 years of design life)
  - **With 3 mil coating:** 42.1 mil (depletion of bare steel occurs in 28.4 years)
  - **With 5 mil coating:** 18.6 mil (depletion of bare steel occurs in 12.6 years)

If desired, a more detailed corrosion evaluation report can be developed by ANS Geo, or others, to interpret the soil corrosivity test results and estimate the rate of corrosion for zinc and bare steel resulting from exposure to the surrounding environment. This detailed corrosion evaluation may be provided to a foundation or structural engineer to incorporate the test results into the design and selection of pile foundations, or other buried steel across the site.

6.1.2 Buried Concrete

Corrosive soils can have a significant impact on below-grade concrete foundations by potentially damaging or weakening the concrete. One of the primary forms of concrete deterioration due to exposure to corrosive soils is sulfate attack. Sulfate attack is a common form of concrete deterioration which occurs when concrete encounters water or soil containing sulfates. Sulfates are typically found in some soils, in seawater, and in wastewater treatment plants. The principal factors which affect the rate and severity of sulfate attack are permeability of concrete, concentration of sulfates, tricalcium aluminate (C3A) content, and calcium hydroxide content. When sulfates react with C3A, it will form ettringite which will expand and create internal tension within the concrete that eventually leads to cracking. Therefore, a low C3A content is one of the main considerations when selecting cements for sulfate resistance. For example, for severe sulfate exposures, Type V cement with a maximum C3A content of 5% is specified in Table 19.3.2.1 of the ACI Building Code (ACI 318-14).

Recommended concrete properties, including cement type, to resist sulfate attack are based on the site-specific sulfate exposure class, as per ACI318-14, Table 19.3.2.1. The severity of the exposure of concrete to sulfate is divided into four classes (S0 through S3) depending on the water-soluble sulfate in soil (percent by mass) or dissolved sulfates in water (ppm). The sulfate exposure class limits are given in **Table 9** below.

Table 9: Sulfate Exposure Classification from ACI318-14 Table 19.3.2.1

Sulfate Exposure Class	Water-Soluble Sulfate (SO_4^{2}) in soil, percent by mass	Dissolved Sulfate (SO_4^{2}) in groundwater, ppm
S0	$SO_4^{2} < .10$	$SO_4^{2} < 150$
S1	$.10 \leq SO_4^{2} < .20$	$150 \leq SO_4^{2} < 1{,}500$ or seawater
S2	$.20 \leq SO_4^{2} \leq 2.00$	$1{,}500 \leq SO_4^{2} \leq 10{,}000$
S3	$SO_4^{2} > 2.00$	$SO_4^{2} > 10{,}000$

As shown in **Section 4.3 (Table 7)**, the results of laboratory corrosion testing indicate the water-soluble sulfate concentration within soil at the top five feet has a maximum sulfate concentration of 60 (mg/kg) or .006 percent by mass. Based on the results of this testing, the site soils appear to have a sulfate exposure class of **S0**, which corresponds to **negligible** sulfate exposure. ANS Geo recommends that concrete adheres to the requirements of ACI 318-14, Table 19.3.2.1 for concrete properties including maximum water-cement ratio, minimum compressive strength (psi), and cement type for the site-specific sulfate exposure class. For sulfate exposure class **S0**, external sulfate attack is likely not a concern and there are no recommended restrictions on cement type.

In addition, NRCS refers to the "risk of corrosion" of concrete as the potential impact of soil-induced electrochemical or chemical processes that can result in the corrosion or deterioration of concrete. The corrosion rate of concrete is predominantly determined by factors such as soil sulfate and sodium content, texture, moisture levels, and soil acidity. Concrete within installations intersecting soil boundaries or layers is more prone to corrosion compared to installations entirely situated within a uniform soil type or single soil layer. The NRCS survey classifies the Cowden-Piasa silt loams, and Virden-Fosterburg silt loams material as moderate risk for the corrosion of concrete. The full NRCS soil report is provided as **Attachment H**.

ANS Geo recommends that concrete mix is designed in accordance with the requirements of ACI 318-14, Table 19.3.2.1 for concrete properties including maximum water-cement ratio, minimum compressive strength (psi), and cement type for the site-specific sulfate exposure class.

6.2 Frost & Ad-freeze Considerations

6.2.1 Frost Depth

According to the US Department of Commerce, within Montgomery County, Illinois, the local frost depth is mapped to exist at approximately **24 inches (2.0 feet) below grade**. ANS Geo recommends that all shallow (non-pile) foundations should be embedded at least to this depth. Shallower foundation depths may also be accommodated, provided they are appropriately frost-protected by way of appropriately designed haunched edges, foam insulation, and/or free-draining structural fill extending to the frost depth.

For shallow foundations which are not load-bearing or sensitive to movement, such foundations may be able to be founded at shallower depths. ANS Geo should be contacted to provide recommendations for minimum embedment depth in this scenario.

6.2.2 Ad-freeze Influence

We recognize that fluctuations in air temperature, snow cover and insulation, and historic freezing indices have shown empirical correlations of shallower frost depth. For design of array and support structure pile foundations, shallower depths of frost influence may be considered, hereby referred to as “ad-freeze depth”.

Given the location of the project and soils encountered, the potential for frost heave against post foundations should be considered. Fine-grained soils, or granular soils with greater than 10 percent fine-grained content are frost-susceptible due to the inability of entrapped moisture from infiltrating or evaporating prior to freezing. Trapped moisture will begin to create ice lenses, which will grip the steel posts or embedded structures, followed by ice-jacking due to frost heave. The phenomenon is more commonly referred to as "ad-freeze stress", which can be considered as an external, upward force applied to the post. The magnitude of the upward force will depend on the depth/thickness of the frost zone, the interface bond stress between embedded structure/material and the surrounding area, and the surface area of the structure/material in contact with this bond stress.

Several methods exist to evaluate frost susceptibility of soils, including determination of fine-grained content of near-surface soils, evaluation of air freezing index, and local, empirical correlations. Frost penetration depth may be calculated in multiple ways, including local, County, or State building code frost depths, the US Army Corps of Engineers method using the modified Berggren Equation, and empirical data.

Using the modified Berggren Equation, frost penetration depth can also be calculated based on assumed values for soil density, moisture content, thermal conductivity, air freezing index, and volumetric latent heat of soil. Using site-specific values and assumptions, input into the modified Berggren Equation, and our professional opinion and experience, the calculated frost penetration depth for a 100-year return period, for ad-freeze stress consideration purposes, is roughly 19.8 inches.

Based on our evaluation, since conditions may exist where snow cover is not present during low temperature extremes, and using a calculated depth of frost penetration, ANS Geo recommends that piles may be designed considering an "ad-freeze depth" of **20 inches** (1.67 ft) below grade with the presence of sod/vegetative cover. As predominantly topsoil was observed near grade, ANS Geo recommends that an unfactored ad-freeze (uplift) stress of 1,500 pounds per square foot (10.4 psi) be considered within the 20-inch ad-freeze depth of posts for panel foundation sizing and design.

6.3 Soil Shrink & Swell Potential

Shrinkage and swelling of soils refer to the volumetric change (decrease and increase) exhibited in primarily fine-grained soils due to a change in moisture conditions. The extent of shrinking and swelling is largely influenced by the type and amount of clay present in the native near-surface soils. Higher-risk soils generally include fine-grained material with a high clay content, greater than 50 percent by weight, and liquid limits of 50 percent or higher (fat clays). Since the encountered soils did not exhibit high plastic clays, the risk for soil shrink and swell potential is low.

6.4 Recommended Soil Parameters for Array Post Design – Driven Piles

Based on our interpretation of the subsurface conditions observed within our limited investigation program, ANS Geo recommends that the soil parameters in **Table 10** be considered for preliminary pile design within array areas **only**. Other foundation types, such as slab-on-grade and shallow foundations are provided in **Section 6.5**.

Table 10: Recommended Soil (LPILE) Parameters for Pre-Drilled and Driven Pile Design

Depth	LPILE Material Model	Total Unit Weight (pcf)	Cohesion (psf)	Soil Modulus (k_{static}) (pci)	Soil Strain (E_{50})	Allowable End Bearing (psf)	Allowable Side Resistance (psf)
0 to 2	*Med. Stiff Clay w/o Free Water*	95	750	*Default*	0.012	--	--
2 to 12	*Med. Stiff Clay w/o Free Water*	100	1,000	*Default*	0.009	1,900	225
12 to 20	*Silt (Reese)*	115	2,000	*Default*	0.006	3,500	350

1. These recommendations consider a minimum factor of safety of 3.0 for end-bearing and 2.5 for skin friction conditions. These can be reduced with a field scale pile load testing campaign.
2. An equivalent box perimeter area approach was utilized for axial capacities.
3. These recommendations assume average groundwater at approximately 8 feet BGS.

ANS Geo recommends that allowable side resistance within the upper 24 inches feet (2.0 feet) be neglected due to frost impact, and adfreeze stresses, as noted in **Section 6.2**, be considered. The results in **Table 10** are conclusions justified by a limited investigation program conducted in March and April of 2025. It is our recommendation that verification load testing using the proposed pile section, embedment depth, and driving equipment, as well as detailed structural calculations, be performed prior to construction to confirm these recommendations.

ANS Geo further notes that the parameters provided in **Table 10** are considering direct embedment of piles using conventional installation techniques. Should pre-drilling be completed, or ground screws be used, **Table 10** should not be used since the diameter of pre-drilling, pre-drilled hole backfill, and ground contact/socket resistance of the pile or screw against the hole will influence the design recommendations. Recommended design parameters for pre-drilled and installed piles or ground screws should be determined using field-scale testing, using the means-and-methods planned during construction, to simulate the performance of those piles and provide design guidance for the alternate means of installation.

6.5 Recommended Soil Parameters – Shallow Foundations

It is anticipated that slabs, footings, and other shallow foundations will be used to support lightly loaded structures proposed as part of the PV development. ANS Geo has provided recommendations in **Table 11** for these types of structures. In preparing the recommended soil parameters for shallow foundation design, it is assumed that some tolerance to settlement is allowable (less than one-inch total) and that there would not be any significant point loads from auxiliary structures and weight of equipment(s) would be uniformly spread across each slab. Otherwise, foundations should be reinforced to minimize settlement.

Table 11: Recommended Soil Parameters for Shallow Foundation (Slab) Design

Depth (ft)	Material	Max. Allowable Bearing Pressure (psf)		Vertical Subgrade Modulus	Soil / Concrete Friction Factor
		Strip Footings / Grade Beams	Isolated Square / Circular Footings		
0 to 0.1	Topsoil	--	--	--	0.25
0.1 to 2	Clay	1,000	1,300	20	0.30
2 to 4	Clay	1,200	1,550	30	0.32
4+	Clay/Silt	1,500	2,000	80	0.33

ANS Geo notes that **Table 11** includes bearing capacities for layers which may be impacted by frost. For foundations which are founded within the frost zone (as noted in **Section 6.2**), these foundations should be frost-protected by way of appropriately designed haunched edges, foam insulation, and/or free-draining structural fill extending to the frost depth. The recommended parameters in **Table 11** assumes that shallow foundations are founded on compacted structural fill atop proof-rolled and properly prepared native material, free from any deleterious material, and with any large cobbles or boulders removed if exposed within the prepared subgrade. If native subgrade material is unsuitable, ANS Geo recommends over-excavation to a minimum depth of one-foot beneath the foundation depth, the placement of a geotextile separation fabric, and the controlled placement of lifts of compacted crushed stone or structural fill (as specified in **Table 12**). Crushed stone or select fill should be placed in lifts not exceeding 12-inches, and should be compacted using three, round-trip passes of a minimum 5-ton vibratory roller.

Should the maximum allowable bearing capacity be lower than necessary, ANS Geo recommends over-excavating below the proposed foundation depth and replacement of native material using 12-inches of compacted crushed stone or structural fill placed and prepared as noted above. For each additional 12-inches of over-excavation and replacement of crushed stone or structural fill below three (3) feet below grade, an increase of 250 psf can be achieved up to a maximum allowable bearing capacity of 2,400 psf.

The above recommendation in **Table 11** is based on isolated footings with dimensions producing less than 100 square feet. Mat foundations (100 square feet or larger, such as larger substation slabs) should be founded at a depth of at least 24 inches or greater on at least 12 inches of properly compacted fill as indicated in **Section 7.3 – Subgrade Preparation**. Alternatively, if shallower embedment is desired, frost susceptible material below mat foundation to the frost depth should be removed and replaced with non-frost susceptible. Rigid mat foundations placed on properly compacted fill may be designed for a maximum allowable bearing capacity of 1,700 psf and may be designed for a maximum settlement of two inches. For the foundation soils, the modulus of subgrade reaction for the mat foundation system could be taken as 60 pci. The modulus of subgrade reaction across the mat varies based on the imposed bearing pressure concentrations on the mat. Based on the estimated bearing capacity and center and edge settlements, the modulus of subgrade reaction can vary in the order of 30 to 80 pci. The mat foundation should be constructed on a one-foot-thick compacted structural fill layer, as mentioned above. A vapor retarder such as polyethylene sheeting can be provided directly beneath the mat foundation to limit the potential for water to wet the underlying fine-grained soils. Adequate construction joints and reinforcement should be provided to reduce the potential for cracking of the floor slab due to differential movement.

Lastly, sliding resistance of any shallow foundations will be largely provided by the friction between the concrete foundation and the underlying subgrade soils, as well as the passive resistance provided by the surrounding overburden. Although the concrete foundation will be separated from the native soil by a compacted structural fill layer, we have conservatively considered direct contact on native fine-grained soils for purposes of obtaining a design value. The base friction coefficient for the foundation on native clayey soils may be taken as 0.3. The strains required to mobilize base friction are not compatible with the strains required to mobilize passive resistance. Therefore, we recommend that passive earth pressure be ignored.

7 Construction Recommendations

7.1 Excavation

Depending on proposed foundation configurations, degree of earthwork, and depth of utilities, some excavations may extend deeper than four feet below grade. Excavations deeper than four feet should be shored or sloped and benched, in accordance with OSHA regulations, to ensure safe working conditions within the excavations. For benching purposes, clay may be considered as "Type A" material which should be sloped no steeper than ¾H:1V (horizontal to vertical). Clayey sands, "Type B", should be limited to 1H:1V or flatter. "Type C", flowing (non-cohesive) sands, should utilize 1-1/2H:1V or shallower. All OSHA soil classifications should be field determined by the contractor's "competent person" prior to excavation. Any proposed shoring systems should be designed by the contractor's "competent person", be certified by a Professional Engineer licensed in the State of Illinois and should be submitted to the engineer for review.

Within our soil borings split spoon refusal was encountered due to presence of pebbles/cobbles within the upper 20 feet. The contractor should be aware of the likelihood of cobbles, and/or boulders within excavations and earthwork activities. ANS Geo notes that pre-drilling for post locations, if required and identified during subsequent pull-out testing at the site, should also be considered and is further discussed in **Section 7.6**.

7.2 Dewatering

At the time of our geotechnical investigation, groundwater was not observed in the borings, but it was observed in both of the test pits at the depth of 7.5 to 8.0 feet below grade. Due to the low permeability of the soils encountered in the borings, a relatively long period of time may be necessary for a groundwater level to develop and stabilize in a borehole in these materials. Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident at the time the boring and test pits were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be observed. The contractor should be prepared to manage seasonal groundwater, perched water, and/or infiltrated stormwater as needed using localized sump-and-pump or similar techniques to allow for concrete foundation construction in-the-dry. Provisions should be made to protect areas which have been recently stripped and prepared, as well as to control surface water which may become perched groundwater if unabated.

Water discharge should be managed in compliance with applicable state and local regulations. The contractor should be sure to grade the surface as necessary to divert stormwater away from open excavation to the extent possible.

7.3 Subgrade Preparation

Prior to the installation of shallow concrete foundations, ANS Geo recommends over-excavating the subgrade by at least 12-inches, proof-rolling the subgrade, lining the exposed material with a geotextile separation fabric, and bringing the subgrade back up to the design foundation elevation with compacted structural fill as specified within **Table 12**. Native material beneath the separation fabric should be inspected for unsatisfactory conditions such as standing water, frozen soil, unsuitable soil, organics, protruding cobbles or boulders, or deleterious materials.

Should any unsatisfactory conditions exist within the native subgrade, the excavation should be undercut an additional six (6) inches (18 total inches beneath proposed foundation depth) prior to placement of the geotextile separation fabric.

Table 12: Recommended Gradation of Structural Fill

Sieve Size	Percent Passing
3-inch	100
1 ½-inch	60 – 100
No. 4	30 – 60
No. 200	0 – 10
Max. Liquid Limit	**Max. Plasticity Index**
30	10

Alternatively, Aggregate Base Course, Type A (100% fractured) or type B (partially fractured), as defined by the Illinois Department of Transportation may be utilized in lieu of aggregate meeting the above requirements.

Should structural fill material not be available, in accordance with the specifications highlighted in **Table 12**, ANS Geo should be contacted to evaluate alternate materials. Structural fill should be placed in loose lifts not exceeding 12-inches if using large equipment, or 8-inches if using hand-operated tools such as jumping jacks, tamping plates, or similar equipment. Structural fill should be placed within two (2) percent of its optimum moisture content and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557). The subgrade preparation (over-excavation, fabric, and structural fill) should horizontally extend at least two (2) times the compacted vertical structural fill thickness beyond each edge of the foundation. For example, a 6-inch over-excavation and compacted structural fill thickness should extend at least 12 inches laterally beyond each foundation edge.

7.4 Backfilling and Re-use of Native Soils

7.4.1 Re-Use of Native soils

ANS Geo notes that any native soils with considerable fine-grained content (more than 20 percent) may be difficult to handle, place, and compact without proper moisture conditioning and protection. ANS Geo recommends the following measures be considered to reduce the adverse impacts of moisture-sensitive soils:

- Positive measures should be implemented and maintained to intercept and direct surface water away from moisture-sensitive subgrade surfaces.
- Subgrade surfaces should be sloped and, as appropriate, seal-rolled to facilitate proper drainage. Surfaces should be properly prepared in anticipation of inclement weather. Moisture should not be allowed to collect on subgrade surfaces.
- To the extent practical, the limits of exposed subgrade soils should be minimized.
- Construction traffic should be limited to properly constructed haul roads.
- Disturbed soils should be removed and replaced with compacted controlled fill material.
- In place moisture contents should be maintained with two percent wet/dry of the optimum moisture content as determined by the Standard Proctor Test (ASTM D698).

These soils may be re-used across the project area for fill in landscaped areas; however, it should not be used under or above foundations or load-bearing structures where typically imported structural fill is used. Native material used as backfill for cable trenches should be handled and placed at a moisture content at or above its optimum value to ensure representative thermal properties are maintained. Native soils may also be used in required “fill” areas within the PV array footprint(s), provided that the material is placed and compacted consistent with the “general backfill” recommendations described herein.

7.4.2 General Backfill

In areas around and above installed foundations, large utilities, and other buried site features, ANS Geo recommends well-graded granular soils or suitable clay soils (IDOT Section 1009.04) may be used as general backfill. Native soils meeting these criteria, if and where present, may also be used. General backfill material should be screened of any cobbles, boulders, and any particles larger than 3 inches in diameter, and should not be used beneath any load-bearing structures. General backfill should be placed in loose lift thicknesses not exceeding 12 inches and be compacted to at least 98 percent of its Standard Proctor Density (ASTM D698). Soil used as backfill should not be handled when frozen and should be free of excessive moisture, organics, and deleterious material.

In fill areas beneath foundations, access roads, and load-bearing structures, ANS Geo recommends structural fill as described in **Section 7.3** and **Table 12**.

7.4.3 Compaction Testing

Compaction testing should be performed at each discrete equipment foundation location for each compacted lift at a minimum of one test per 2,500 square feet. For linear sections such as trenches, the contractor and/or the owner’s representative should perform a visual trench bottom inspection along the length of the trench to confirm no angular, sharp, deleterious, frozen, trash, organic material, or standing water exists at the bottom of trench. For backfilling and compaction of trenches, a minimum of one compaction test per 500 linear feet and minimum one per lift, should be performed. In all cases, the subgrade should be maintained, covered, or protected if concrete is not immediately placed. Excessively wet or dry material should be removed or improved prior to the placement of foundations.

7.5 Interior Site Access Roads

ANS Geo understands that, as part of the work, access roads will be constructed to provide access for heavy equipment such as a main power transformer, poles, and other ancillary structures, as well as long-term access for site maintenance purposes. It is expected that new, unpaved paths will be constructed of aggregate material placed on native, compacted and proof-rolled subgrade stripped of topsoil and other organic material.

During construction, the delivery and movement of heavier loads such as transformers, inverters, delivery of steel and concrete, and transportation of cabling is expected. Construction loads and vehicles are larger and heavier than the expected vehicles during long-term operation; however, the duration of these activities will be much shorter considering the access road life. Designing for short-duration, construction-phase access roads would require increased thickness of aggregate, the use of geogrid, or other soil improvement, but these increased roads would be over-designed for long-term operation including routine light-duty trucks, maintenance vehicles, and infrequent accessibility to emergency personnel including fire-fighting rigs. Therefore, it is typical for access road design to be completed considering the thickness of road base required for long-term use since it is expected that the site subcontractor will be able to maintain serviceable access roads throughout construction and at turn-over of the facility by backfilling ruts greater than two-inches, back-blading and re-compacting loose and rutted areas, re-shaping roads to promote drainage and safe passage of traffic, and other improvements.

Considering the above, ANS Geo has performed an evaluation of the required access road thickness utilizing AASHTO 93 method based on infrequent emergency access for firefighting vehicles as well as occasional light vehicular traffic. Our preliminary road evaluation for a post-construction access road assumed the following:

Table 13: Access Road Design Considerations

Design Consideration	Design Assumption
Equivalent Single-Axle Loads (ESALs)	3,000 and 10,000
Allowable Rut Depth	2 inches
Subgrade Soil	Stiff, Proof-rolled Clay
Assumed Min. Design Subgrade CBR	2.3% (following proof-roll and compaction)

ANS Geo recommends that the base course material consists of material in general meeting specifications within Illinois Department of Transportation (IDOT) Section 1004.04 or better. Material property gradations are presented in **Table 14** below:

Table 14: Recommended Gradation of Crushed Stone

Sieve Size	Percent Passing
2-inch	100
0.25-inch	25 – 60
No. 40	5 – 40
No. 200	0 – 5

Alternatively, Aggregate Base Course meeting gradation CA6, CA7 or better as per Illinois Department of Transportation Section 1004.04 may be utilized in lieu of aggregate meeting the above requirements.

Given the required thickness of a conventional, stone-only access road, we understand the owner may desire a more cost-efficient design. The use of a non-woven geotextile fabric (such as Mirafi HP270) is recommended and can reduce the overall cross sectional stone thickness when followed by the use of a triaxial geogrid (such as Tensar TX7). The access road thickness for each alternative is described in **Table 15**:

Table 15: Recommended Aggregate Thickness for Permanent Site Access Roads

Aggregate Construction Option	3,000 ESAL or Less	10,000 ESAL or Less
Aggregate on prepared native soil	8 inches of Crushed Stone	12 inches of IDOT Crushed Stone
Aggregate with geotextile fabric	7 inches of Crushed Stone over HP270 non-woven geotextile	10 inches of IDOT Crushed Stone over HP270 non-woven geotextile
Aggregate with class II geogrid and geotextile fabric	5 inches of Crushed Stone over Class II geogrid	8 inches of IDOT Crushed Stone over Class II geogrid atop non-woven geotextile
Aggregate over Chemically Stabilized Subgrade	6-inch chemical treatment depth, 6-8% cement by weight + 4 inches Crushed Stone for wearing surface	10-inch chemical treatment depth, 6-8% cement by weight + 4 inches Crushed Stone for wearing surface

It is recommended that a nonwoven geotextile fabric be placed atop the prepared clay subgrade and beneath any geogrid to provide separation and avoid the stone aggregate to be blinded with fines. The geogrid should be placed in accordance with manufacturer's recommendations such as three-foot overlap, fastening or tying overlapping areas, and material storage and handling.

The subgrade should be shaped and sloped with a 4% crown to promote positive drainage into collector ditches or away from the access road to minimize saturating and weakening the subgrade, as well as blinding the stone with fines. The prepared subgrade should be designed to maintain a minimum CBR value of **2.3%.** Depending on field conditions at the time of construction, this may require scarifying the native subgrade soil by several inches, moisture-conditioning the soil, then backfilling and re-compacting the soil to achieve the required performance.

Field CBR testing, or plate load testing should be completed during construction to confirm the subbase compaction has been met. To increase productivity during construction, a test section may also be created prior to the start of production work to determine field CBR of various compaction methods and passes, and dynamic cone penetrometer (DCP) tooling be used to correlate the approximate resistance correlating to the required CBR. This will allow for rapid evaluation and confirmation of field proof-rolling of subgrade. In the event field CBR testing is not desired, material can be evaluated using the Standard Proctor Maximum Dry Density. It is recommended that the subbase be proof rolled to a minimum 98% Standard Proctor Maximum Dry Density (ASTM D698), and within two percentage points of optimum moisture content. Similarly, crushed stone should be placed in loose lifts not exceeding twelve (12) inches in height and be compacted to at least 95 percent of its Modified Proctor Density (ASTM D1557).

Temporary construction roads may also be left in place as permanent access roads, where appropriate. These re-purposed roadways should be back-bladed post-construction and graded to an even, level surface with maximum permissible longitudinal and cross slopes in accordance with the site's civil design criteria. Per the International Fire Code, permanent and temporary access roads, haul roads, and fire apparatus access roads, shall not exceed a maximum grade of 10 percent for greater than 1,000 feet, or greater than 8% for longer lengths. Roads should not exceed a maximum cross-slope of 2 percent across roads. The Civil Engineer of Record may also place water drainage features to promote drainage away from roadways.

Similar to permanent and long-duration access roads, it is expected that aggregate-surfaced access roads will require ongoing maintenance during construction and over the life of the permanent facility to keep them in a serviceable condition, regardless of the aggregate thickness and subgrade preparation. It is not practical to design an aggregate section of adequate thickness that prevents ongoing maintenance. Ruts, depressions, and soft subgrade should be repaired as needed to facilitate traffic. Throughout the operational life of the project, additional aggregate may be placed in ruts and depressions, or the entire aggregate section and soft subgrade may be removed and replaced with a new aggregate section.

If chemical stabilization is performed, the contractor should perform any necessary due diligence to confirm their design, means, and methods. The subgrade should be verified below the treatment depth to evaluate the CBR value of the subgrade prior to treatment. In addition, the recommended chemical stabilization application rate should be taken as an assumed average. The actual application rate should be determined by the contractor and may vary based on the tested and desired subgrade CBR along the proposed roadway, the treatment depth required, and the moisture content. The application rate and treatment depth should be evaluated by performing several test strips at the project site prior to the start of construction and testing the test strips in the field using a dynamic cone penetrometer or plate load test to confirm the CBR. Then, once the application rate and depth are evaluated, verification and calibration testing should be performed using the dynamic cone penetrometer at intervals of no less than 500-linear feet along the access roadway.

7.6 Pile Drivability

ANS Geo anticipates that, as typical with solar farm construction, solar panels will be supported by steel H-Piles (wide-flanged sections) which are directly driven. These steel piles are typically installed via direct-push, vibration, and/or percussive hammer methods.

ANS Geo observed the presence of stiff to hard clay with varying amount of sand and gravel at the soil borings to a depth ranging from 16 to 20 feet below grade. Split spoon refusal (N>50 blows) was also recorded at the depth of about 18 feet or deeper. These subgrade conditions, where present within pile embedment depth, may cause difficult pile driving and/or refusal. As such, we recommend contractor should be prepared for predrilling at select locations across the project boundary, as needed. Should pre-drilling be necessary during remediation, long drive times or to clear localized obstructions, ANS Geo recommends that pre-drilled holes be completed to a diameter slightly smaller than the diagonal dimension of the proposed pile section to ensure a tight fit once the pile is driven to its targeted depth. For example, an under-sized, five (5)-inch diameter hole may be drilled and utilized for W6x9 section (approx. 7.1-inch diagonal measurement). The contractor should be aware, however, that heavier sections (i.e. W6x12 or W6x15) may have limiting "bending" capacity in its flanges and therefore require a hole of a slightly larger proportion. Once pre-drilled, the hole should be backfilled with granular, native cuttings and/or imported sand backfill. Backfill material should be placed in 12-inch layers and compacted in lifts, to ensure proper soil properties are maintained for lateral and axial capacity.

Verification testing should follow the requirements of the Authority Having Jurisdiction, the EPC's racking manufacturer/supplier, or the EPC's structural engineer's quality control testing frequency for pile installation during constriction. If no recommendations are provided by the foundation engineer-of-record, ANS Geo recommends a minimum of 0.2% of piles or two piles per block during construction. Quality control testing quantities should meet industry standards and costs of axial tension and/or axial compression, depending on the governing design capacity, along with lateral load testing. We recommend that piles be allowed a minimum 72-hour "setup" time between installation and testing during verification load testing to maximize soil contact and strength.

8 Limitations

ANS Geo notes that the findings and recommendations presented within this Geotechnical Report are based on our investigation program conducted in March and April of 2025, and our engineering judgment. In addition, the current level of investigation does not represent the level of investigation to support a final design, and it is expected that a final, detailed-level geotechnical investigation will be completed at the site prior to final design and start of construction by an EPC to confirm and further define the recommendations provided herein. If ANS Geo's limited and preliminary investigation is used for final design, our recommendations shall only be valid for the exact and specific locations at which field investigations or laboratory testing were completed. All other areas and regions of the site which are not investigated under a final investigation to confirm if our preliminary and limited investigation is valid for the entire project site will be at the risk of the individual or entity using this Report.

If actual site subsurface conditions differ from the inferred conditions on which ANS Geo has based our confirmation-dependent recommendations, ANS Geo will need to modify our confirmation-dependent recommendations to develop final recommendations.

Attachment A

Site Investigation Mapping

ANS GEO

Client:

IRONWOOD RENEWABLES

INVESTIGATION LOCATION PLAN

IRONWOOD RENEWABLES
ATTICUS SOLAR, LLC
HILLSBORO, ILLINOIS

Legend

- Project Boundary
- Boring Location
- Test Pit Location
- Electrical Resistivity Test Location

0 300 600 ft

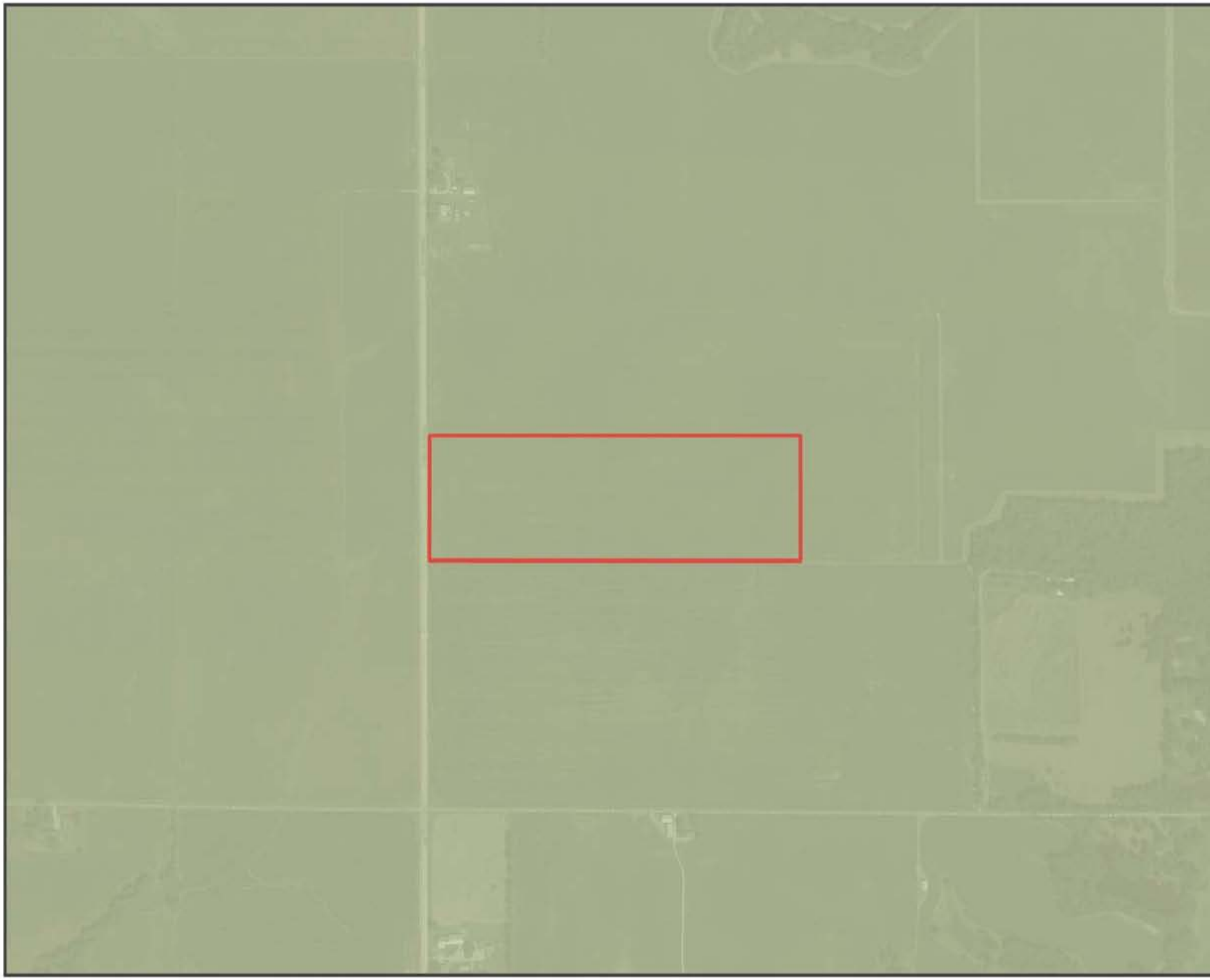
Absolute Scale: 1 inch = 300 feet
Scale at 11" x 17" AS SHOWN

Prepared by: Gabriela Pirinelli
Date: April 30, 2025
Drawing Number: ILP-1 Rev.0

Attachment B

Geological Mapping

SURFICIAL GEOLOGY MAP



ANS GEO

Client:

IRONWOOD RENEWABLES

SURFICIAL GEOLOGY MAP

IRONWOOD RENEWABLES
ATTICUS SOLAR, LLC
HILLSBORO, ILLINOIS

Legend

Project Boundary

Surficial Material

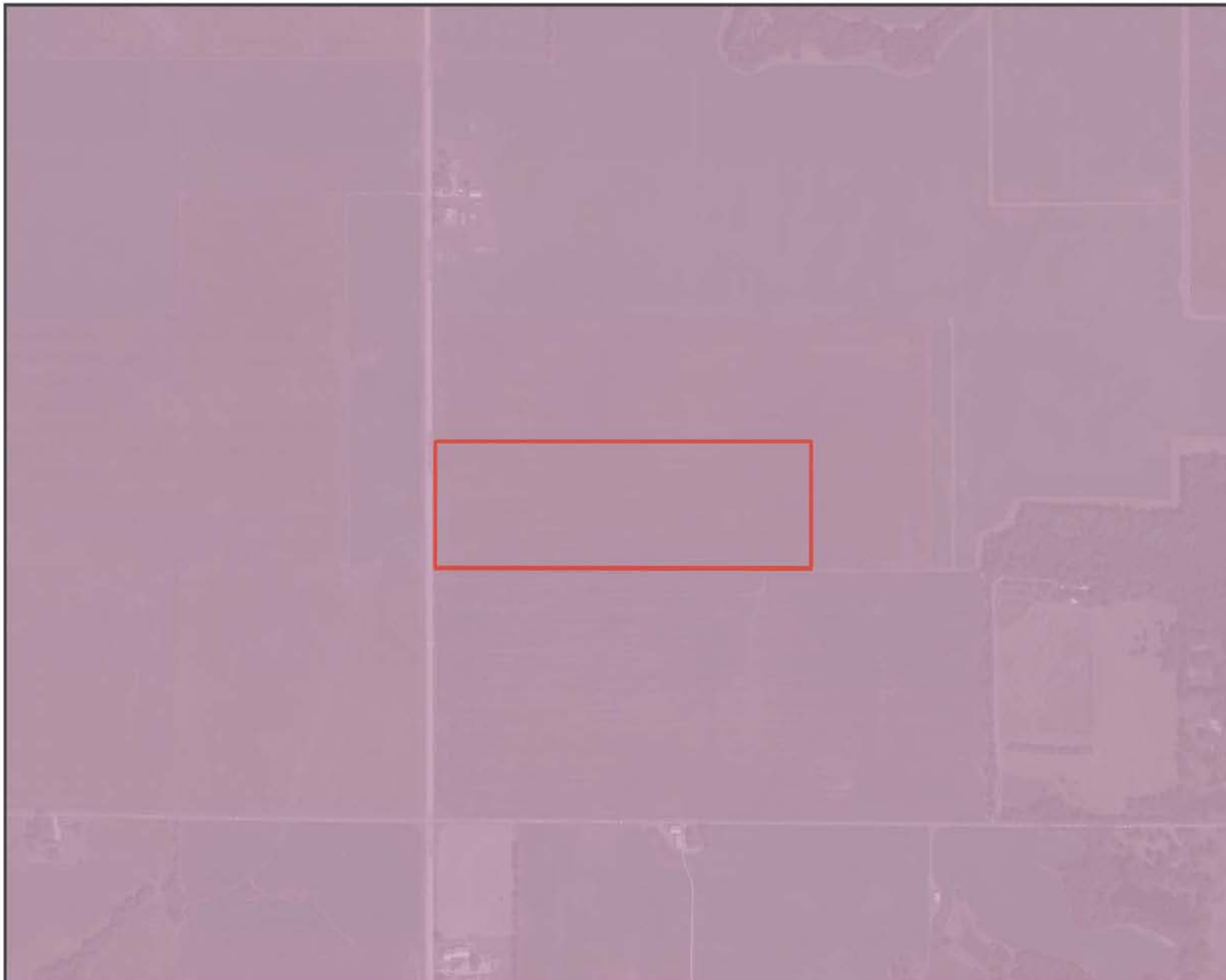
Glacial till sediments, mostly silty, thin

0 500 1,000 ft

Absolute Scale: 1 inch = 500 feet
Scale at 11" x 17" AS SHOWN

Prepared by: Gabriela Pirinelli
Date: April 30, 2025
Drawing Number: SG-1 Rev.0

BEDROCK GEOLOGY MAP



ANS GEO

Client:

IRONWOOD RENEWABLES

BEDROCK GEOLOGY MAP

IRONWOOD RENEWABLES
ATTICUS SOLAR, LLC
HILLSBORO, ILLINOIS

Legend

Project Boundary

Bedrock Geology

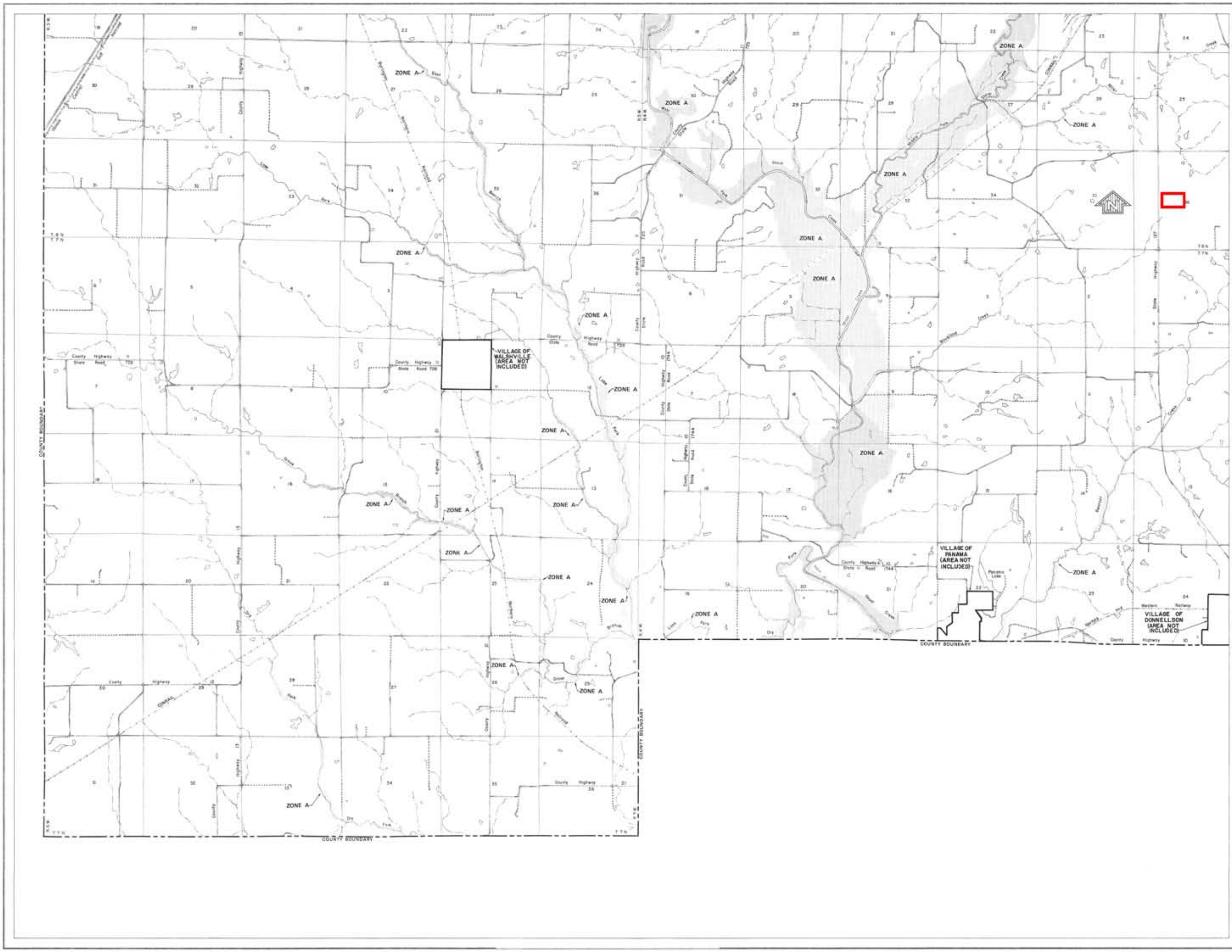
Bond Formation

0 500 1,000 ft

Absolute Scale: 1 inch = 500 feet
Scale at 11" x 17" AS SHOWN

Prepared by: Gabriela Pirinelli
Date: April 30, 2025
Drawing Number: BG-1 Rev.0

FEMA FLOOD ZONE MAP



KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA	ZONE A

NATIONAL FLOOD INSURANCE PROGRAM

FHBM

FLOOD HAZARD BOUNDARY MAP

MONTGOMERY COUNTY, ILLINOIS

UNINCORPORATED AREA

PANEL 8 OF 9

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
170992 0008 A

EFFECTIVE DATE:
JANUARY 9, 1981

federal emergency management agency
federal insurance administration

Attachment C

Soil Boring Logs

Soil Boring Log

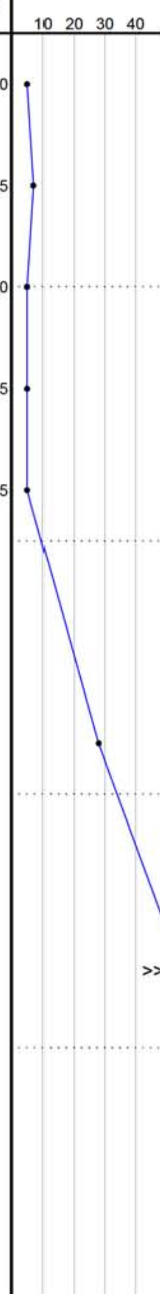
B-01

Client:	Ironwood Renewables	**Drilling Firm:**	MET	**Coordinates:**	39.091275 N, 89.486636 W
Project:	Atticus Solar, LLC	**Drill Crew:**	Zach / Jack	**Horiz. Datum:**	WGS84
Location:	Hillsboro, Illinois	**Boring Start:**	04/01/25 09:55 AM	**Elevation:**	Grade
Inspector:	Gabriela Pirinelli	**Boring End:**	04/01/25 10:20 AM	**Vert. Datum:**	N/A

Rig Model:	Diedrich D-70	**Sampler Type:**	Split Spoon	**Casing Type:**	N/A
Rig Type:	Track	**Sampler Length:**	24 inches	**Casing Length:**	N/A
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 inches	**Casing I.D.:**	N/A
Hammer Type:	Automatic	**Hammer Wt.:**	140 pounds	**Hammer Wt.:**	N/A
Drilling Fluid:	None	**Hammer Fall:**	30 inches	**Hammer Fall:**	N/A

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	Drilling & Strata Notes
						3" TOPSOIL					
	S-1	15	2 2 3 3	5	CL	Medium stiff, brown CLAY, little Silt, trace coarse to fine Sand, moist (CL)	L	M	1.00	0.30	
	S-2	12	2 3 4 5	7	CL	Medium stiff, brownish yellow to gray CLAY, little Silt, trace coarse to fine Sand, moist (CL)	M	M	1.50	0.25	Mottling observed from 2 to 10 feet BGS.
5	S-3	19	2 2 3 4	5	CL	Medium stiff, gray CLAY, some Silt, trace coarse to fine Sand, moist (CL)	M	M	1.25	0.40	
	S-4	21	2 2 3 3	5	ML	Medium stiff, gray SILT, some Clay, trace coarse to fine Gravel, trace coarse to fine Sand, moist (ML)	M	L	1.25	0.15	
	S-5	19	2 2 3 4	5	ML	Medium stiff, brownish yellow to gray SILT, little Clay, trace coarse to fine Gravel, trace coarse to fine Sand, moist (ML)	L	L	0.50	0.15	
10					ML						
	S-6	24	4 10 18 30	28	ML	Very stiff, gray SILT, trace coarse to fine Gravel, trace coarse to fine Sand, dry (ML)	H	L	>4.50		
15					ML						
	S-7	11	28 50/5.5	> 50	ML	Hard, gray SILT, trace coarse to fine Gravel, trace coarse to fine Sand, dry (ML)	H	L	>4.50		Splitspoon refusal encountered at 18.9 feet BGS.
						End of boring at 18.9 feet BGS. Borehole backfilled with soil cuttings.					
20											

N-Value



In-Borehole Water Levels

Date / Time	Reading Event	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)

General Notes

BGS = Below Ground Surface
No groundwater encountered.

Toughness: Low (L), Medium (M), High (H)
Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H)
PP = Pocket Penetrometer, measured in tons per square ft.
TV = Torvane (Shear Vane), measured in tons per square ft.

▽ = ATD Water Level (At Time of Drilling)
▼ = AD Water Level (After Drilling - Short Term)
▼ = EOD Water Level (End of Drilling - Long Term)

Soil Boring Log

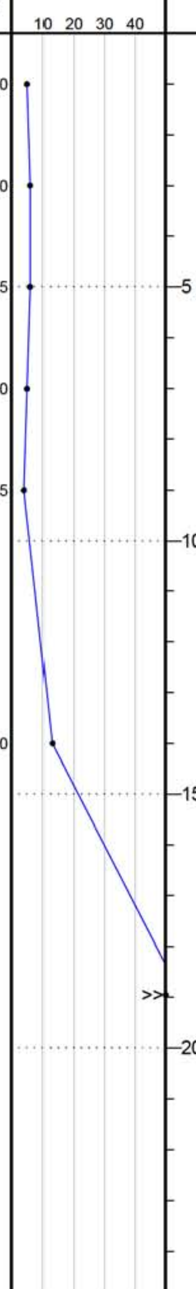
B-02

Client:	Ironwood Renewables	**Drilling Firm:**	MET	**Coordinates:**	39.090039 N, 89.484527 W
Project:	Atticus Solar, LLC	**Drill Crew:**	Zach / Jack	**Horiz. Datum:**	WGS84
Location:	Hillsboro, Illinois	**Boring Start:**	04/01/25 09:10 AM	**Elevation:**	Grade
Inspector:	Gabriela Pirinelli	**Boring End:**	04/01/25 09:45 AM	**Vert. Datum:**	N/A

Rig Model:	Diedrich D-70	**Sampler Type:**	Split Spoon	**Casing Type:**	N/A
Rig Type:	Track	**Sampler Length:**	24 inches	**Casing Length:**	N/A
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 inches	**Casing I.D.:**	N/A
Hammer Type:	Automatic	**Hammer Wt.:**	140 pounds	**Hammer Wt.:**	N/A
Drilling Fluid:	None	**Hammer Fall:**	30 inches	**Hammer Fall:**	N/A

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	Drilling & Strata Notes
							1" TOPSOIL					
	S-1	11	2 2 3 4	5	ML		Medium stiff, brown SILT, little Clay, trace coarse to fine Sand, moist (ML)	M	L	2.00	0.20	
	S-2	17	2 2 4 5	6			Medium stiff, brown to gray CLAY, little Silt, trace coarse to fine Sand, moist (CL)	M	M	1.50	0.20	Mottling observed from 2 to 15 feet BGS.
5	S-3	19	2 3 3 4	6	CL		Medium stiff, gray CLAY, some Silt, trace coarse to fine Gravel, trace coarse to fine Sand, moist (CL)	M	M	1.50	0.45	
	S-4	17	2 2 3 3	5			Medium stiff, brownish yellow to gray CLAY, some Silt, trace coarse to fine Gravel, trace coarse to fine Sand, moist (CL)	M	M	1.00	0.20	
	S-5	16	1 2 2 3	4			Medium stiff, brownish yellow to gray SILT, little Clay, trace coarse to fine Gravel, trace coarse to fine Sand, moist (ML)	L	L	0.50	0.15	
10												
	S-6	20	3 9 4 2	13	ML		Stiff, brownish yellow to gray Sandy SILT, trace coarse to fine Gravel, trace Clay, moist (ML)	H	L	>4.50	0.10	
15												
	S-7	23	21 28 30 50/5	> 50			Hard, gray SILT, trace coarse to fine Gravel, trace coarse to fine Sand, dry (ML)	H	L	>4.50		Splitspoon refusal encountered at 19.9 feet BGS.
20							End of boring at 19.9 feet BGS. Borehole backfilled with soil cuttings.					

N-Value



In-Borehole Water Levels

Date / Time	Reading Event	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)

General Notes

BGS = Below Ground Surface
No groundwater encountered.

Toughness: Low (L), Medium (M), High (H)
Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H)
PP = Pocket Penetrometer, measured in tons per square ft.
TV = Torvane (Shear Vane), measured in tons per square ft.

∇ = ATD Water Level (At Time of Drilling)
▼ = AD Water Level (After Drilling - Short Term)
▼ = EOD Water Level (End of Drilling - Long Term)

ANS GEO

Soil Boring Log

B-03

Client:	Ironwood Renewables	**Drilling Firm:**	MET	**Coordinates:**	39.091197 N, 89.482529 W
Project:	Atticus Solar, LLC	**Drill Crew:**	Zach / Jack	**Horiz. Datum:**	WGS84
Location:	Hillsboro, Illinois	**Boring Start:**	04/01/25 08:35 AM	**Elevation:**	Grade
Inspector:	Gabriela Pirinelli	**Boring End:**	04/01/25 09:00 AM	**Vert. Datum:**	N/A

Rig Model:	Diedrich D-70	**Sampler Type:**	Split Spoon	**Casing Type:**	N/A
Rig Type:	Track	**Sampler Length:**	24 inches	**Casing Length:**	N/A
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 inches	**Casing I.D.:**	N/A
Hammer Type:	Automatic	**Hammer Wt.:**	140 pounds	**Hammer Wt.:**	N/A
Drilling Fluid:	None	**Hammer Fall:**	30 inches	**Hammer Fall:**	N/A

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	Drilling & Strata Notes
						1" TOPSOIL					
	S-1	12	2 2 2 4	4	CL	Medium stiff, dark gray CLAY, trace Silt, moist (CL)	M	M	1.50	0.15	
	S-2	13	2 2 4 4	6	CL	Medium stiff, dark gray CLAY, trace Silt, moist (CL)	M	M	1.00	0.40	
5	S-3	18	2 3 3 5	6	CL	Medium stiff, dark gray CLAY, some Silt, trace coarse to fine Sand, moist (CL)	M	M	2.00	0.40	Mottling observed from 4 to 10 feet BGS.
	S-4	19	2 2 3 2	5	CL	Medium stiff, dark brown CLAY, some Silt, trace coarse to fine Gravel, trace coarse to fine Sand, moist (CL)	M	M	1.50	0.40	
	S-5	14	1 1 3 3	4	CL	Medium stiff, gray CLAY, little Silt, trace fine Gravel, trace coarse to fine Sand, moist (CL)	M	M	1.00	0.30	
10											
	S-6	24	2 11 14 18	25	ML	Very stiff, gray SILT, trace coarse to fine Gravel, trace coarse to fine Sand, moist (ML)	H	L	>4.50	0.10	
15											
	S-7	24	18 21 30 28	> 50	ML	Hard, gray SILT, trace coarse to fine Gravel, trace coarse to fine Sand, dry (ML)	H	L	>4.50		
20						End of boring at 20 feet BGS. Borehole backfilled with soil cuttings.					

N-Value

In-Borehole Water Levels

Date / Time	Reading Event	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)

General Notes

BGS = Below Ground Surface
No groundwater encountered.

Toughness: Low (L), Medium (M), High (H)
Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H)
PP = Pocket Penetrometer, measured in tons per square ft.
TV = Torvane (Shear Vane), measured in tons per square ft.

= ATD Water Level (At Time of Drilling)
= AD Water Level (After Drilling - Short Term)
= EOD Water Level (End of Drilling - Long Term)

ANS GEO

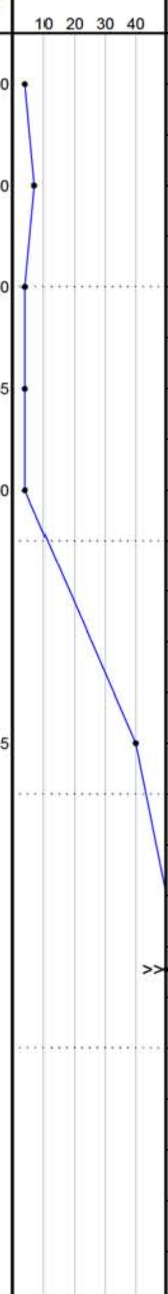
Soil Boring Log

B-04

Client:	Ironwood Renewables	**Drilling Firm:**	MET	**Coordinates:**	39.090022 N, 89.480572 W
Project:	Atticus Solar, LLC	**Drill Crew:**	Zach / Jack	**Horiz. Datum:**	WGS84
Location:	Hillsboro, Illinois	**Boring Start:**	04/01/25 08:00 AM	**Elevation:**	Grade
Inspector:	Gabriela Pirinelli	**Boring End:**	04/01/25 08:25 AM	**Vert. Datum:**	N/A

Rig Model:	Diedrich D-70	**Sampler Type:**	Split Spoon	**Casing Type:**	N/A
Rig Type:	Track	**Sampler Length:**	24 inches	**Casing Length:**	N/A
Drill Method:	Hollow Stem Auger	**Sampler I.D.:**	1.375 inches	**Casing I.D.:**	N/A
Hammer Type:	Automatic	**Hammer Wt.:**	140 pounds	**Hammer Wt.:**	N/A
Drilling Fluid:	None	**Hammer Fall:**	30 inches	**Hammer Fall:**	N/A

Depth (ft)	Sample No.	Rec. (in)	Blows per 6"	N-Value	USCS Symbol	Graphic Log	Visual Classification	Toughness	Plasticity	PP (tsf)	TV (tsf)	Drilling & Strata Notes
					CL		1" TOPSOIL					
	S-1	15	2 2 2 4	4			Medium stiff, brown CLAY, little Silt, moist (CL)	L	M	0.50	0.30	
	S-2	16	2 3 4 5	7			Medium stiff, brown to gray CLAY, trace coarse to fine Sand, trace Silt, moist (CL)	M	M	1.50	0.30	Mottling observed from 2 to 10 feet BGS.
5	S-3	18	2 2 2 4	4			Medium stiff, brownish yellow to gray CLAY, trace coarse to fine Sand, trace Silt, moist (CL)	M	M	1.00	0.40	
	S-4	19	2 2 2 3	4			Medium stiff, gray CLAY, little Silt, trace coarse to fine Sand, moist (CL)	M	M	1.00	0.35	
	S-5	15	1 2 2 4	4			Medium stiff, brownish yellow to gray CLAY, trace coarse to fine Gravel, trace coarse to fine Sand, trace Silt, moist (CL)	M	M	1.50	0.40	
10												
	S-6	19	2 10 30 38	40	ML		Hard, gray SILT, little Clay, trace coarse to fine Gravel, trace coarse to fine Sand, moist (ML)	H	L	3.50	0.45	
15												
	S-7	7	10 50/5	> 50			Hard, gray SILT, trace coarse to fine Gravel, trace coarse to fine Sand, dry (ML)	H	L	>4.50		Splitspoon refusal encountered at 18.9 feet BGS.
							End of boring at 18.9 feet BGS. Borehole backfilled with soil cuttings.					
20												



In-Borehole Water Levels

Date / Time	Reading Event	Casing Tip (ft)	Bot. of Hole (ft)	Water Lvl (ft)

General Notes

BGS = Below Ground Surface
No groundwater encountered.

Toughness: Low (L), Medium (M), High (H)
Plasticity: Non-Plastic (NP), Low (L), Medium (M), High (H)
PP = Pocket Penetrometer, measured in tons per square ft.
TV = Torvane (Shear Vane), measured in tons per square ft.

= ATD Water Level (At Time of Drilling)
= AD Water Level (After Drilling - Short Term)
= EOD Water Level (End of Drilling - Long Term)

Attachment D

Test Pit Logs

Test Pit Photo Log

Project Name	**Ironwood Renewables – Atticus Solar, LLC**	Test Pit ID	TP-01	
Site Location	**Hillsboro, Illinois**	Date	23-April-2025	
Test Pit Contractor	LT Excavation	ANS Geo Representative	Collin Lester	
Equipment Used	**Takeuchi TB 145**	Weather/Temp	Cloudy/78°	
Final Test Pit Depth (feet)	**9.7 feet (117 inches)**	Time Opened/Close	15:30	16:05
Groundwater Depth (feet)	**8.0 feet (96 inches)**	Coordinates	39.09020°, -89.48630°	

0 - 10 "
Dark brown topsoil

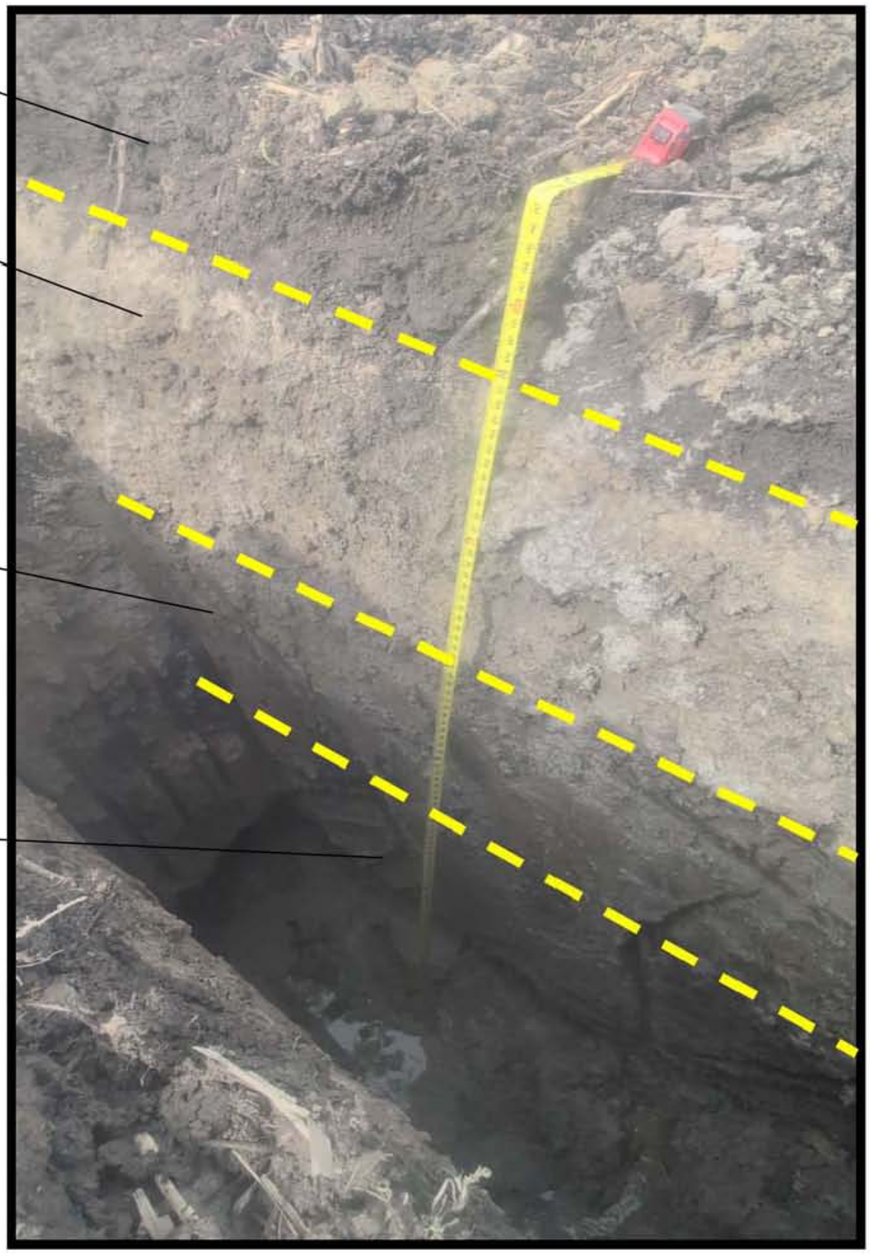
10 - 60 "
Light gray to brownish yellow CLAY, moist

Mottling observed

60 - 91 "
Light gray to brownish yellow CLAY, little medium to fine Sand, moist

Mottling observed

91 - 117 "
Light gray to brownish yellow coarse to fine SAND, trace coarse to fine Gravel, moist



N

Test Pit Photo Log

Project Name	**Ironwood Renewables – Atticus Solar, LLC**	Test Pit ID	TP-02	
Site Location	**Hillsboro, Illinois**	Date	23-April-2025	
Test Pit Contractor	LT Excavation	ANS Geo Representative	Collin Lester	
Equipment Used	**Takeuchi TB 145**	Weather/Temp	Cloudy/78°	
Final Test Pit Depth (feet)	**10.0 feet (120 inches)**	Time Opened/Close	16:20	16:50
Groundwater Depth (feet)	**7.5 feet (90 inches)**	Coordinates	39.09119°, -89.48085°	

0 - 7 ”
Dark brown topsoil

7 - 30 ”
Brown CLAY, moist

30 - 54 ”
Light gray to brownish yellow to brown CLAY, trace coarse to fine Sand, moist

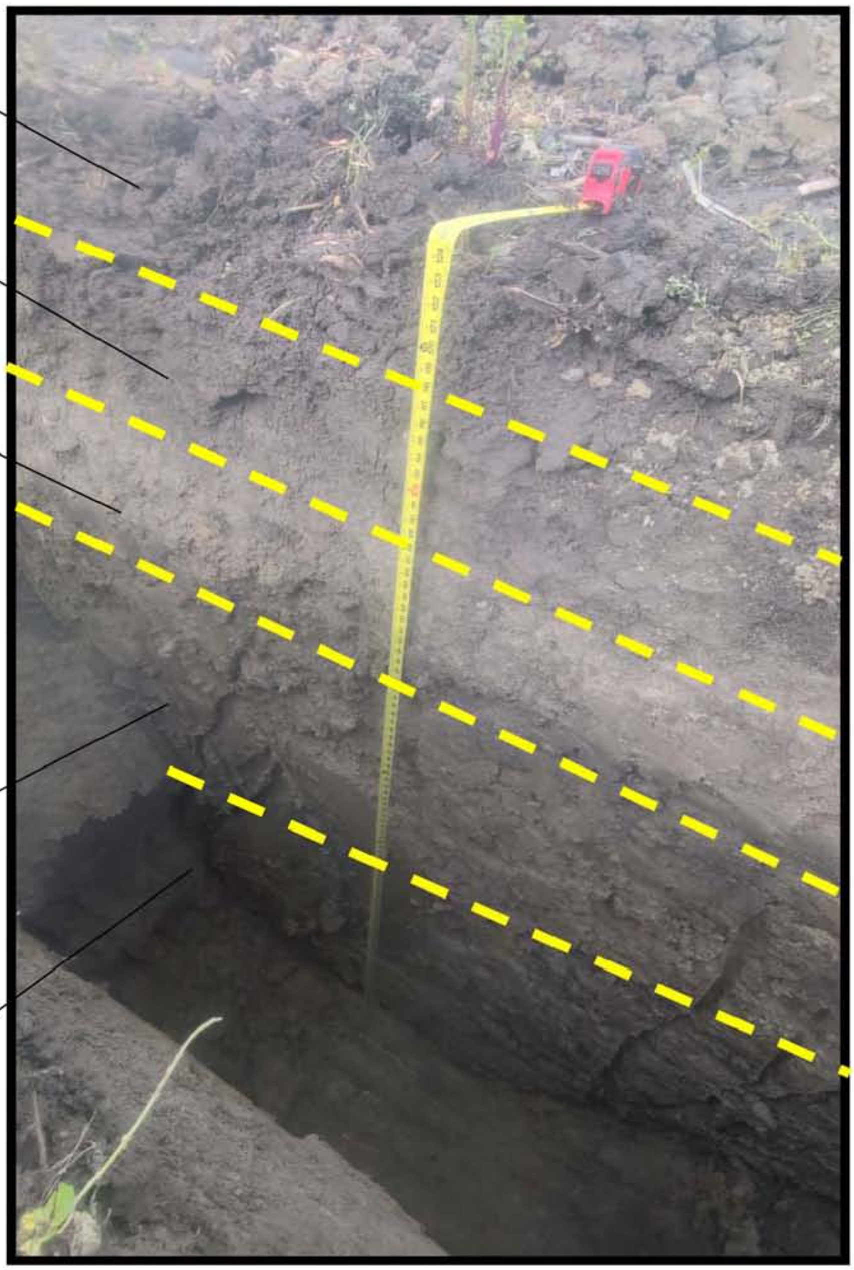
Mottling observed

54 - 96 ”
Light gray to brownish yellow CLAY, little coarse to fine Sand, moist

Mottling observed

96 - 120 ”
Light gray to brownish yellow CLAY, some coarse to fine Sand, moist

Mottling observed



N

Attachment E

Laboratory Test Results

MOISTURE CONTENT ANALYSIS RESULTS

ANS CONSULTANTS, INC.
4405 South Clinton Avenue
South Plainfield, NJ 07080

Tel: (800) 585-ATUL
(908) 754-8383
Fax: (908) 754-8633

NJ EDA Approved Testing Laboratory • MBE/DBE Certified • NJ DEP Certified
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Soil, Concrete, Masonry, Rebar, Asphalt, Structural Steel, Precast, Piles, Caissons, Fire-Proofing, Roofing, Soil Boring, Concrete/Rock Coring, UST Removal, Environmental Testing & Reports

Laboratory Determination of Water (Moisture) Content of Soil and Rock (ASTM D2216)

Client Name: Ironwood Renewables
LAB IRN: 25-N-163
Project Name: Atticus Solar, Hillsboro, IL
Date: 4/28/2025

Sample ID	B-01, S-3	B-02, S-6	B-02, S-4	B-03, S-5	B-04, S-2
Depth	4'-6'	13'-15'	6'-8'	8'-10'	2'-4'
Wet soil + Tare (g)	635.3	959.8	513.7	468.3	445.7
Dry soil + Tare (g)	523.3	891.9	420.6	393.8	356.9
Wt. of Tare (g)	12.0	192.8	12.7	13.2	12.6
Moisture Content	**21.9%**	**9.7%**	**22.8%**	**19.6%**	**25.8%**

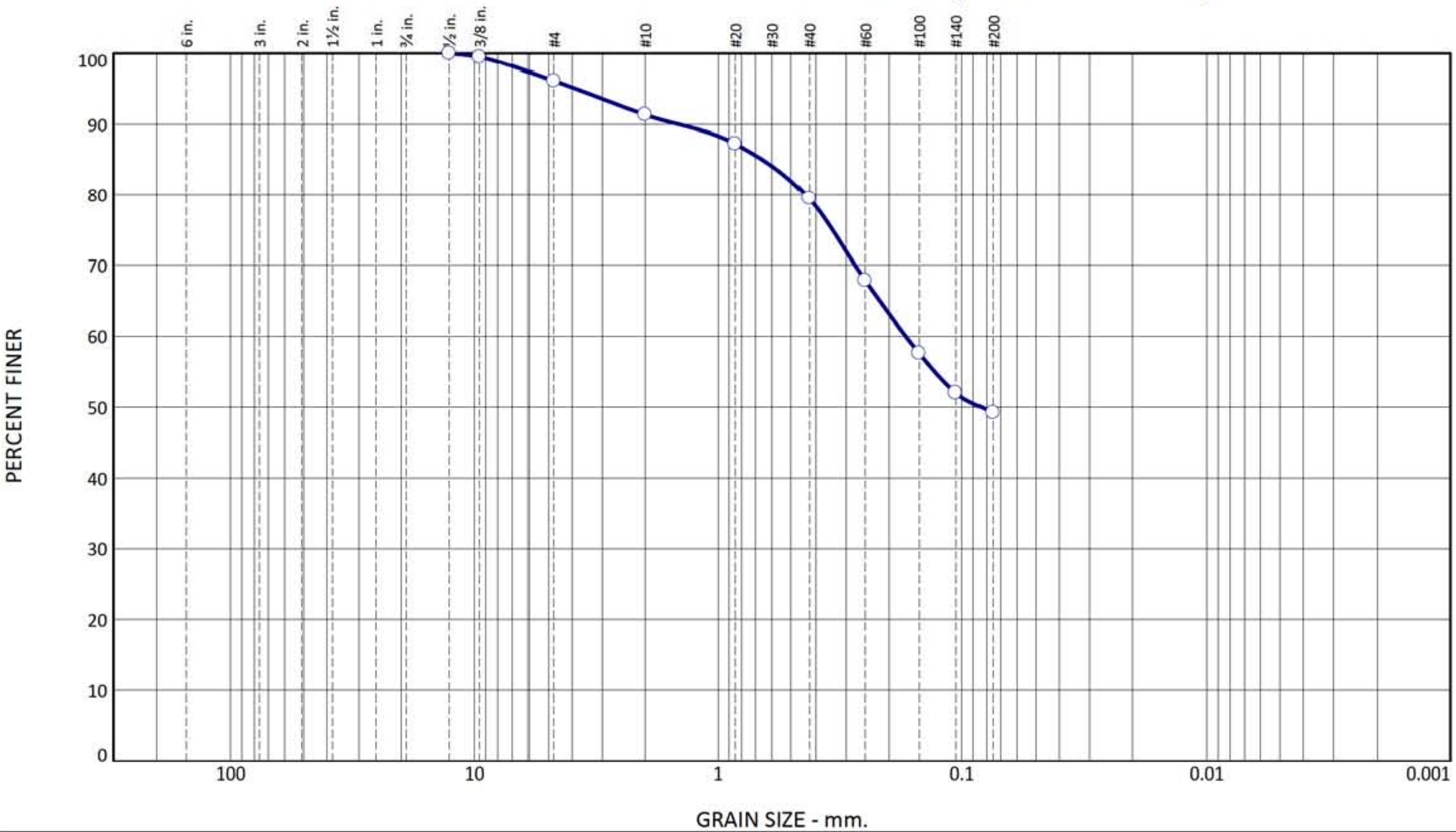
Sample ID	B-02, TRT-1	B-03, CORR-1	B-04, CORR-2	B-01, CBR-1
Depth	3'-5'	0'-5'	0'-5'	1'-3'
Wet soil + Tare (g)	338.9	353.2	318.3	369.5
Dry soil + Tare (g)	268.0	280.3	260.1	291.0
Wt. of Tare (g)	13.3	12.2	12.2	13.1
Moisture Content	**27.9%**	**27.2%**	**23.5%**	**28.2%**

Tested By: MG

Checked By: ANS

SIEVE ANALYSIS

PARTICLE SIZE DISTRIBUTION REPORT (ASTM D6913)



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.9	4.7	11.9	30.3	49.2	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5"	100.0		
0.375"	99.5		
#4	96.1		
#10	91.4		
#20	87.2		
#40	79.5		
#60	67.8		
#100	57.6		
#140	52.0		
#200	49.2		

* (no specification provided)

Soil Description

Olive Brown

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.4466 D_{85}= 0.6573 D_{60}= 0.1707
D_{50}= 0.0836 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample Number: B-02, S-6 **Depth:** 13'-15'

Date: 4/28/2025

ANS CONSULTANTS, INC.

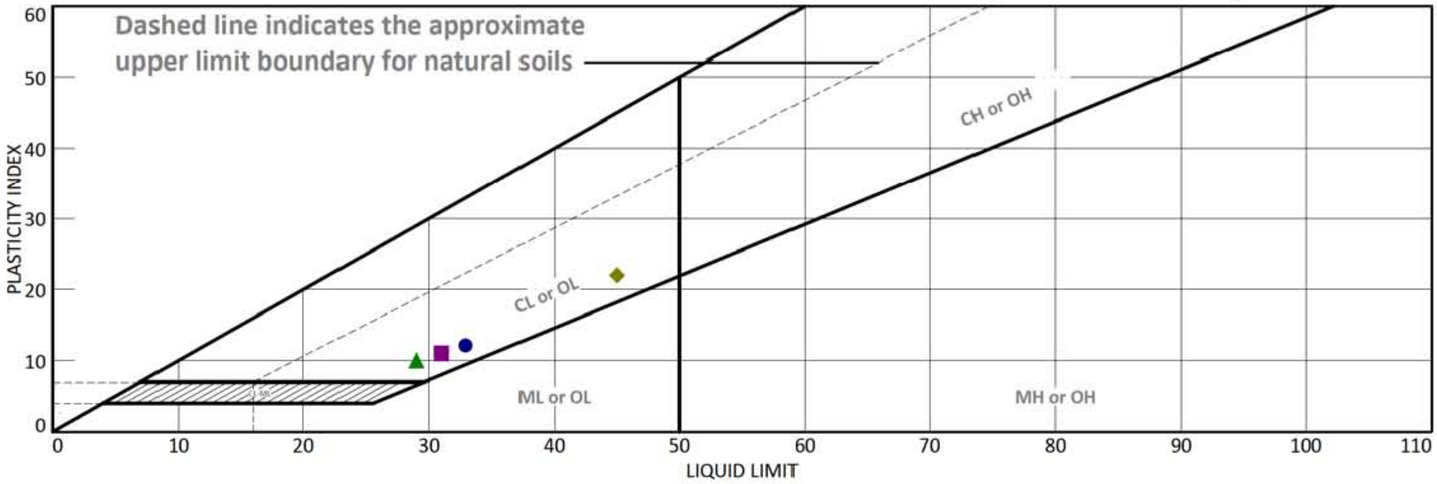
South Plainfield, New Jersey

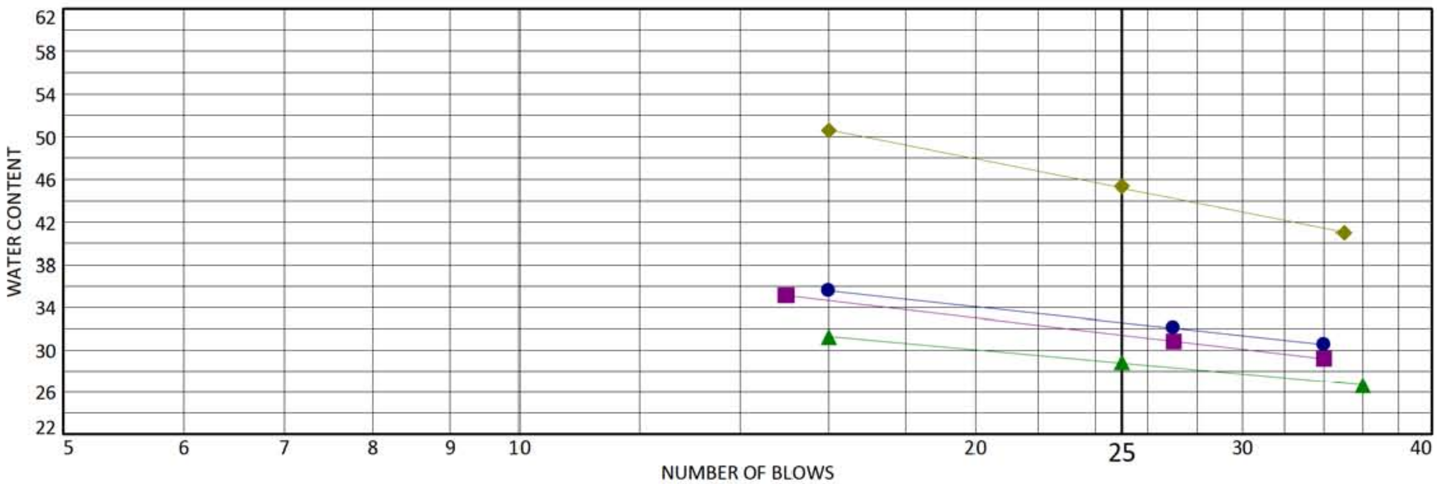
Client: Ironwood Renewables
Project: Atticus Solar, Hillsboro, IL
Project No: IRN 25-N-163 **Figure**

Tested By: RS **Checked By:** ANS

ATTERBERG LIMITS RESULTS

LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D4318)





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray Clay & Silt, little cmf Sand (Visual)	33	21	12			
■	Olive Brown Clay & Silt, little cmf Sand (Visual)	31	20	11			
▲	Olive Brown Clay & Silt, some cmf Sand (Visual)	29	19	10			
◆	Olive Brown Clay & Silt, trace cmf Sand (Visual)	45	23	22			

Project No. IRN 25-N-163 **Client:** Ironwood Renewables

Project: Atticus Solar, Hillsboro, IL

●**Depth:** 4'-6' **Sample Number:** B-01, S-3

■**Depth:** 6'-8' **Sample Number:** B-02, S-4

▲**Depth:** 8'-10' **Sample Number:** B-03, S-5

◆**Depth:** 2'-4' **Sample Number:** B-04, S-2

Remarks:

●ASTM D4318 - Sample Air-Dried, LL Device: Manual, PL Rolling Method: Hand-Rolled, Grooving Tool: Metal
4/28/2025

ANS CONSULTANTS, INC.

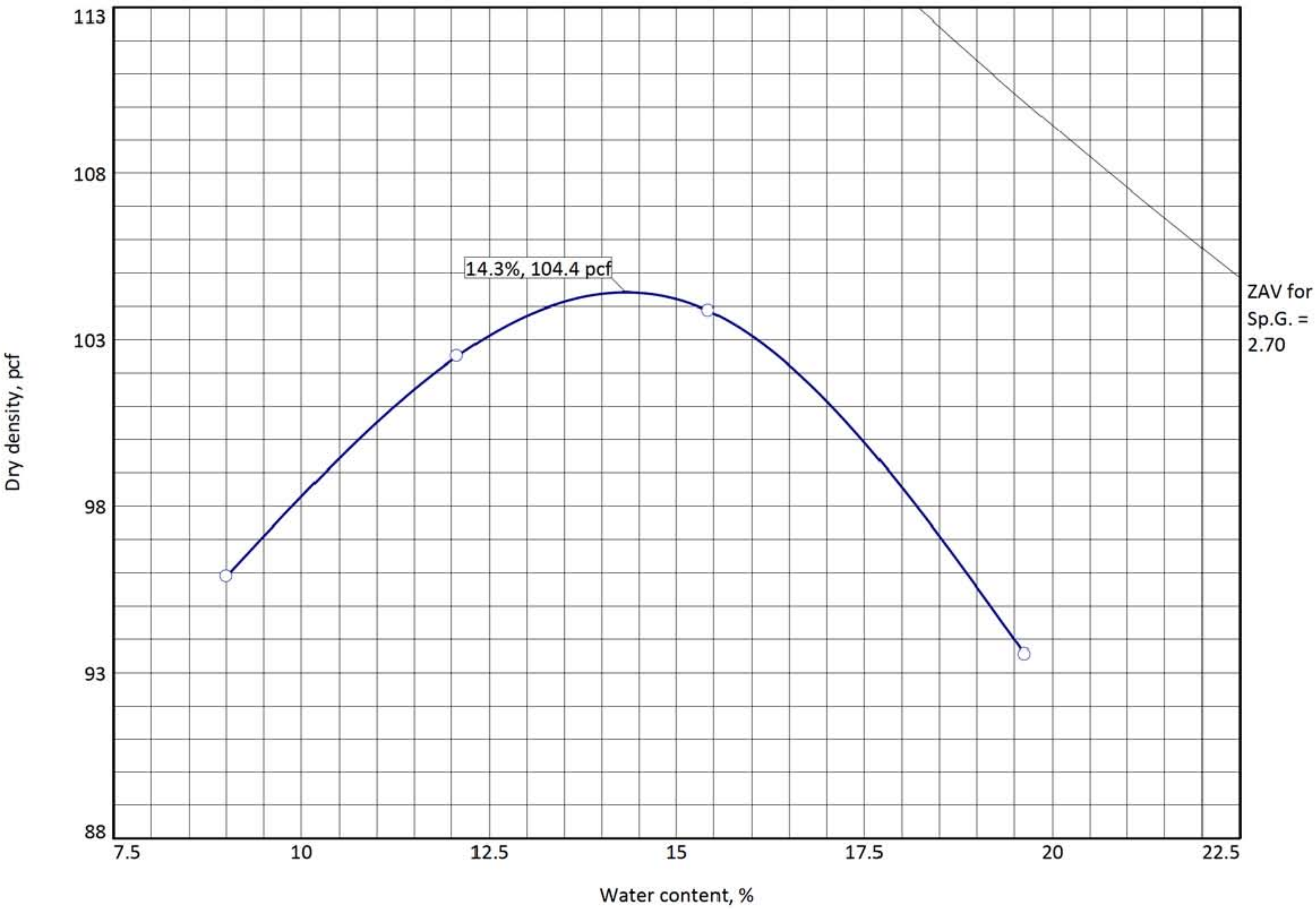
South Plainfield, New Jersey

Figure

Tested By: AG **Checked By:** ANS

THERMAL RESISTIVITY RESULTS

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
3'-5'				2.7			0	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.4 pcf Optimum moisture = 14.3 %	Grayish Brown Clay & Silt, little cmf Sand (Visual)

Project No. IRN 25-N-163 **Client:** Ironwood Renewables

Project: Atticus Solar, Hillsboro, IL

Date: 4/28/2025

○ **Sample Number:** B-02, TRT-1

Remarks:
SG Assumed

ANS CONSULTANTS, INC.

South Plainfield, New Jersey

Figure

Tested By: MG **Checked By:** ANS

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4405 South Clinton Avenue
South Plainfield, NJ 07080
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(908) 754-8383
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Determination of Thermal Conductivity of Soil and Rock by Thermal Needle Probe (ASTM D5334)

Client Name: Ironwood Renewables LAB IRN: 25-N-163

Project Name: Atticus Solar, Hillsboro, IL Date: 4/28/2025

Sample ID: B-02, TRT-1, 3'-5'

Description: Grayish Brown Clay & Silt, little cmf Sand (Visual)

Specimen type: Reconstituted (85% D698) Recompaction Dry Density: 88.7 PCF

In-Situ Moisture: 27.9 % Optimum Moisture: 14.3 %

S.No.	Moisture (%)		Thermal Conductivity (W/m-K)	Thermal Resistivity (°C-cm/W)
1	Dry	0.0	0.4786	208.9
2	¼ OMC	3.6	0.5737	174.3
3	½ OMC	7.2	0.8909	112.2
4	¾ OMC	10.7	1.1133	89.8
5	OMC	14.3	1.2179	82.1
6	In-Situ	27.9	1.3473	74.2

Remarks:

1. Needle size: 1.9 mm diameter × 100 mm length
2. Thermal grease used: High-density polysynthetics silver thermal compound
3. Tested under controlled room temperature conditions (20°C to 22°C).

Tested By: RS

Checked By: ANS

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Thermal Dryout Curve (ASTM D5334)

Client Name: Ironwood Renewables

Project Name: Atticus Solar, Hillsboro, IL

LAB IRN: 25-N-163

Date: 4/28/2025

Sample ID: B-02, TRT-1, 3'-5'

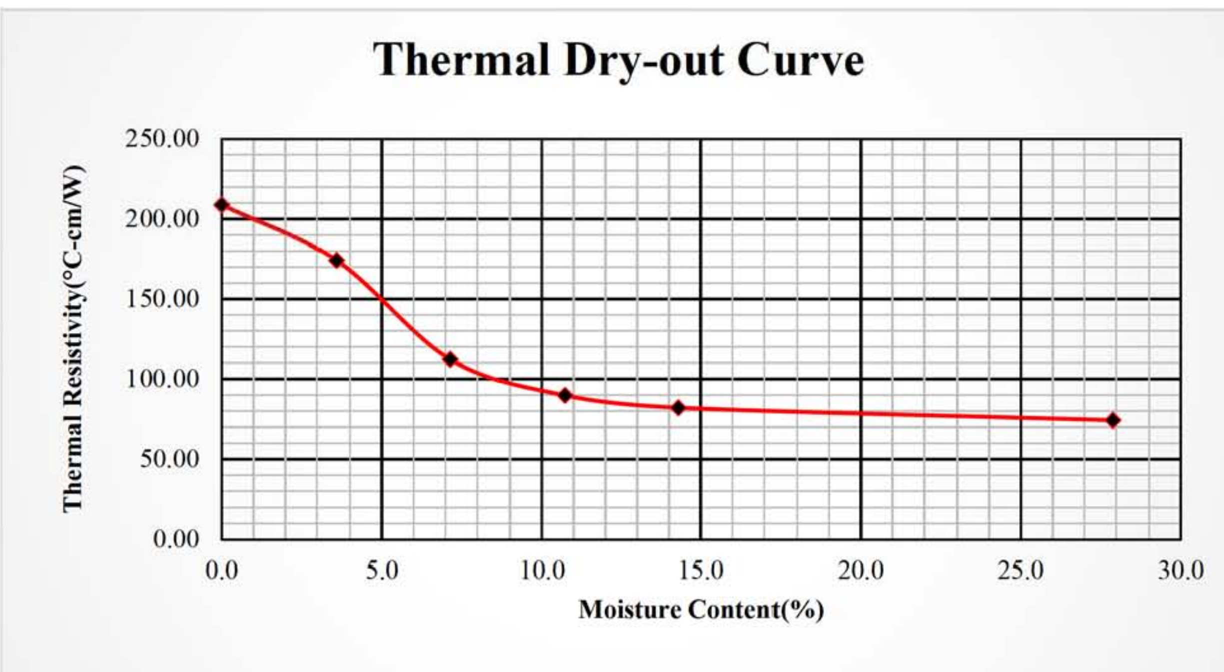
Description: Grayish Brown Clay & Silt, little cmf Sand (Visual)

Specimen type: Reconstituted (85% D698)

Recompaction Dry Density: 88.7 PCF

In-Situ Moisture: 27.9 %

Optimum Moisture: 14.3 %



CORROSIVITY
SUITE
RESULTS

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Corrosivity Testing of Soil

Client Name: Ironwood Renewables — LAB IRN: 25-N-163

Project Name: Atticus Solar, Hillsboro, IL — Date: 4/28/2025

S.No.	Sample	Depth	Soil Resistivity (ohm-cm)	pH of Soil	Sulfate Content (mg/kg)	Chloride Content (mg/kg)	Oxidation-Reduction Pot. (mV)
		Natural Moisture	ASTM G187	ASTM G51	ASTM C1580	AASHTO T291	ASTM G200
1	B-03 Corr-1	0'-5'	1,370	6.3	60	192	294
		27.2%		Dark Brown Clay & Silt, trace cmf Sand (Visual)			
2	B-04 Corr-2	0'-5'	1,190	5.8	60	171	303
		23.5%		Dark Brown Clay & Silt, trace cmf Sand (Visual)			

Remarks:

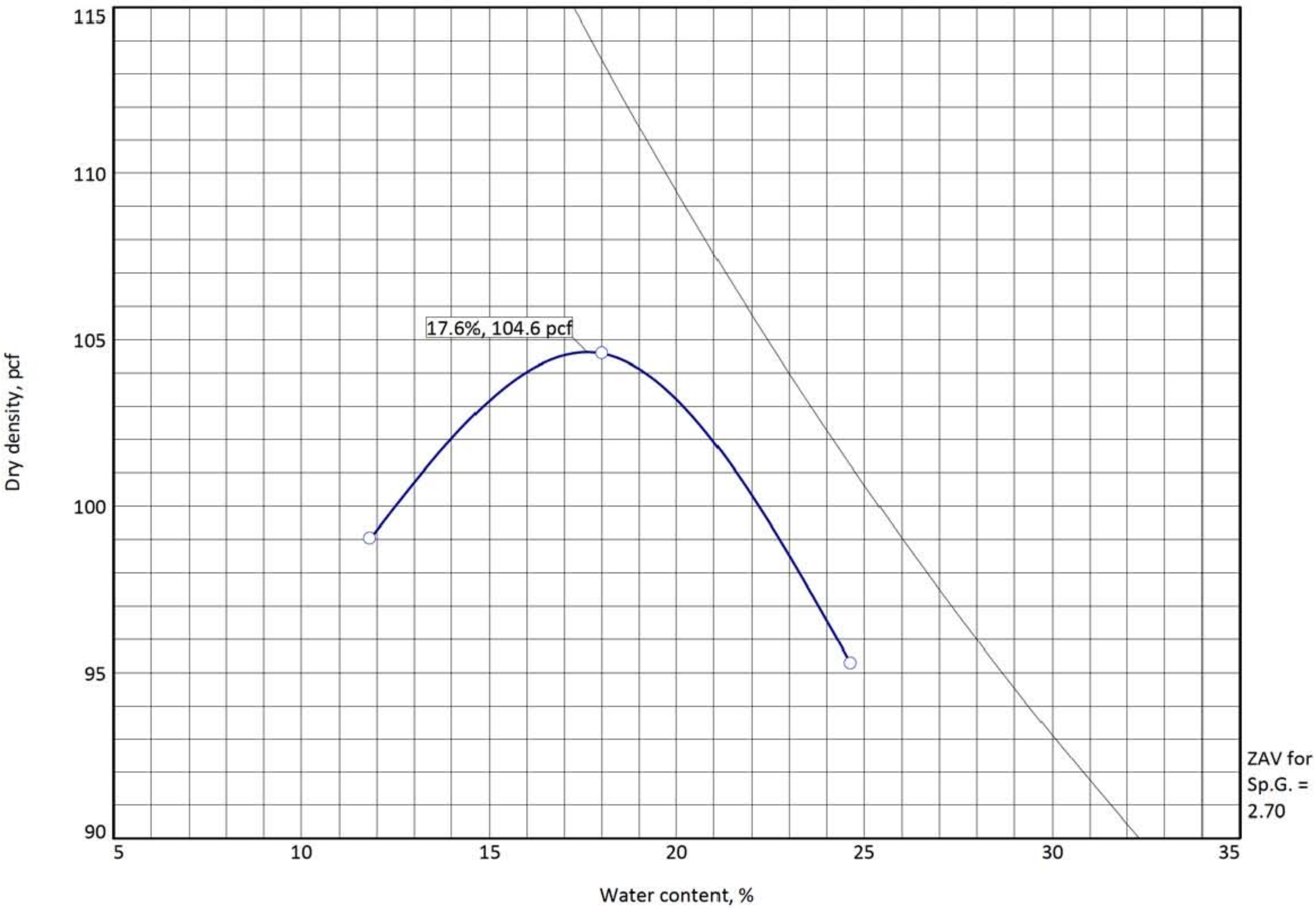
1. Turbidimetric procedure used for ASTM C1580.
2. Mohr's procedure with Silver Nitrate used for AASHTO T291.
3. Miller 400D Resistance Meter used for Resistivity testing, Multiplication factor = 1.
4. As per ASTM G187, gravel and small stones removed from sample.
5. Tests conducted under standard laboratory conditions of temperature (72°F) and humidity.

Tested By: RS

Checked By: ANS

CALIFORNIA BEARING RATIO RESULTS

COMPACTION TEST REPORT



Test specification: ASTM D 698-12 Method B Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
1'-3'				2.7			0	

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.6 pcf Optimum moisture = 17.6 %	Brown Clay & Silt, little cmf Sand (Visual)

Project No. IRN 25-N-163 **Client:** Ironwood Renewables

Project: Atticus Solar, Hillsboro, IL

Date: 4/28/2025

Sample Number: B-01, CBR-1

Remarks:
SG Assumed

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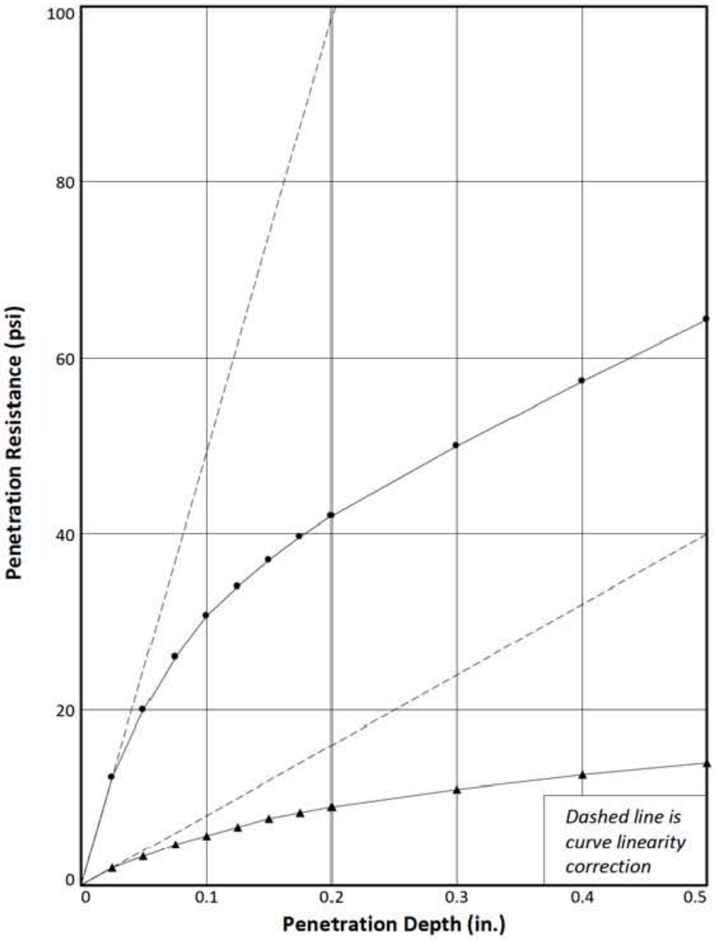
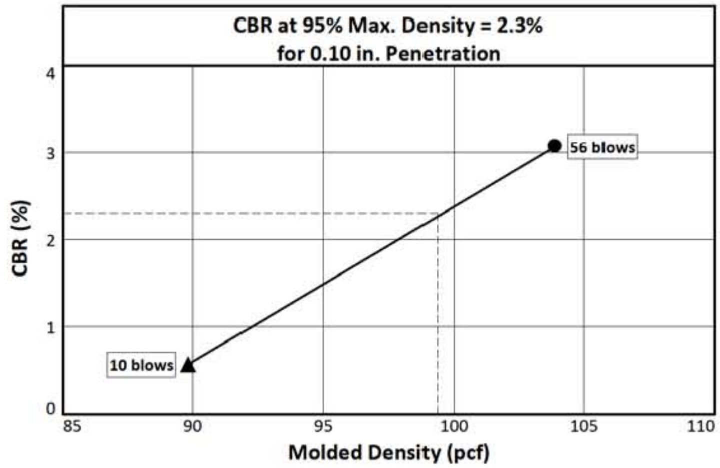
South Plainfield, New Jersey

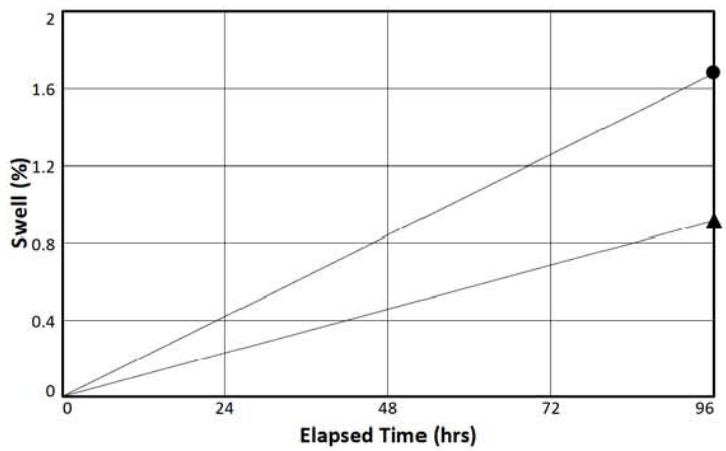
Figure

Tested By: ST **Checked By:** ANS

BEARING RATIO TEST REPORT
ASTM D1883-21







	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ●	103.9	99.3	17.6	102.2	97.7	27.1	3.1	2.8	0.000	10	1.7
2 ▲	89.8	85.9	17.6	89.0	85.1	32.8	0.6	0.6	0.000	10	0.9
3 ■											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
Brown Clay & Silt, little cmf Sand (Visual)		104.6	17.6		

Project No: IRN 25-N-163
Project: Atticus Solar, Hillsboro, IL
Sample Number: B-01, CBR-1 **Depth:** 1'-3'

Date: 4/28/2025

Test Remarks:
Saturation Period: 96 Hours

BEARING RATIO TEST REPORT
ANS CONSULTANTS, INC.

Figure ________

Tested By: MG **Checked By:** ANS

Attachment F

Electrical Resistivity Results

Soil Resistivity Results

Client:	Ironwood Renewables			Date:	3/26/2025
Project Name:	Atticus Solar, LLC			Weather:	Sunny
Project Location:	Hillsboro, Illinois			Temperature:	55 °F
Equipment:	AGI MiniSting				
Test Method:	Wenner 4 Electrode Array				

Array		Data	Array spacing (ft)				
			2	5	10	25	50
ERT-01	N-S	Measured Resistance (Ω)	3.5390	1.4070	0.9256	0.6159	0.4297
		Apparent Resistivity (Ω-m)	13.5545	13.4691	17.7272	29.4894	41.1480
	E-W	Measured Resistance (Ω)	3.8600	1.3840	0.9139	0.6237	0.4519
		Apparent Resistivity (Ω-m)	14.7828	13.2497	17.5016	29.8606	43.2816
ERT-02	N-S	Measured Resistance (Ω)	4.3790	1.1640	0.7240	0.4862	0.3574
		Apparent Resistivity (Ω-m)	16.7701	11.1496	13.8654	23.2806	34.2290
	E-W	Measured Resistance (Ω)	4.2920	1.3720	0.8829	0.5496	0.3854
		Apparent Resistivity (Ω-m)	16.4409	13.1430	16.9103	26.3134	36.9113
		Site Average (Ω)	4.0175	1.3318	0.8616	0.5689	0.4061
		Site Average (Ω-m)	15.3871	12.7528	16.5011	27.2360	38.8925

Attachment F

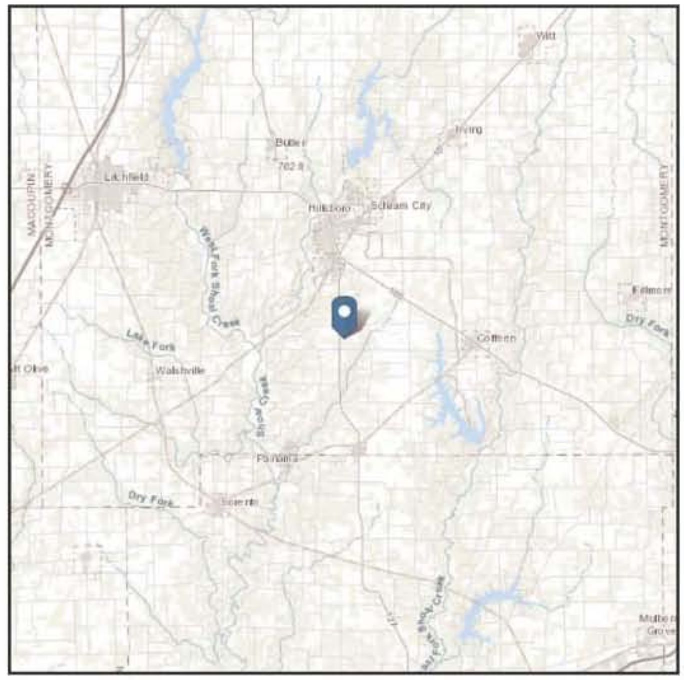
Seismic Site Class Data

ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-22
Risk Category: II
Soil Class: D - Stiff Soil

Latitude: 39.091961
Longitude: -89.484226
Elevation: 618.3838729313279 ft (NAVD 88)



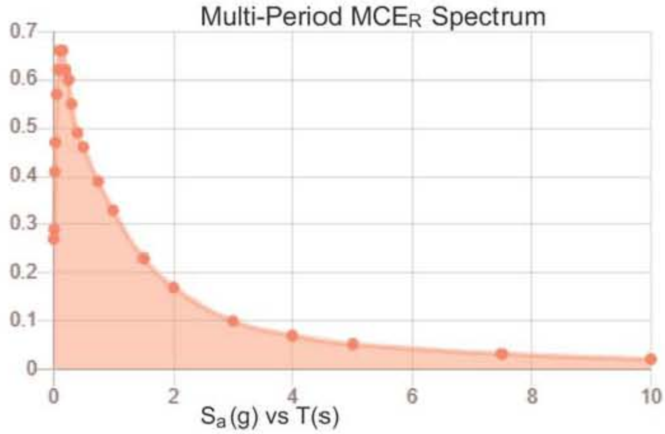
Seismic

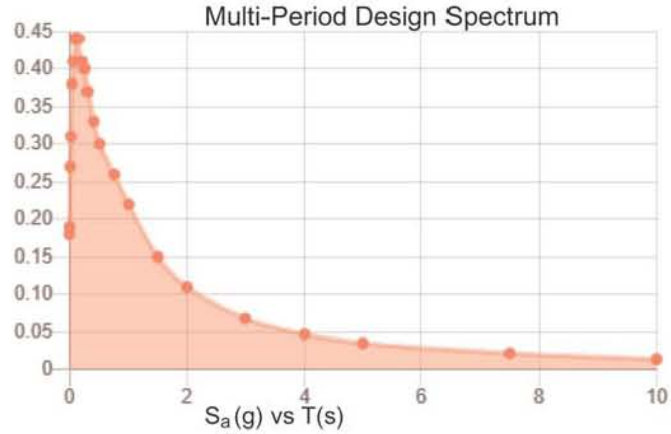
Site Soil Class: D - Stiff Soil

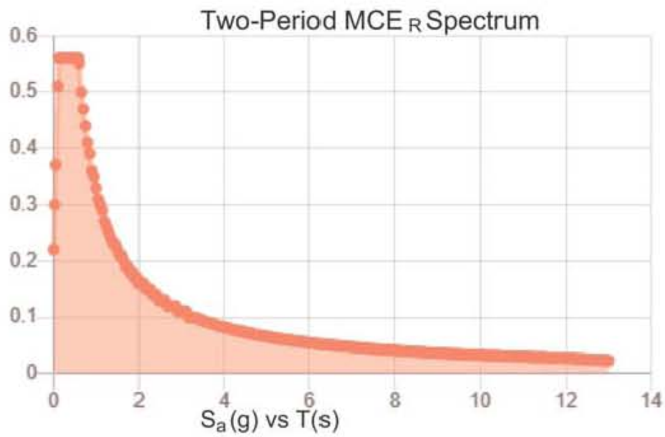
Results:

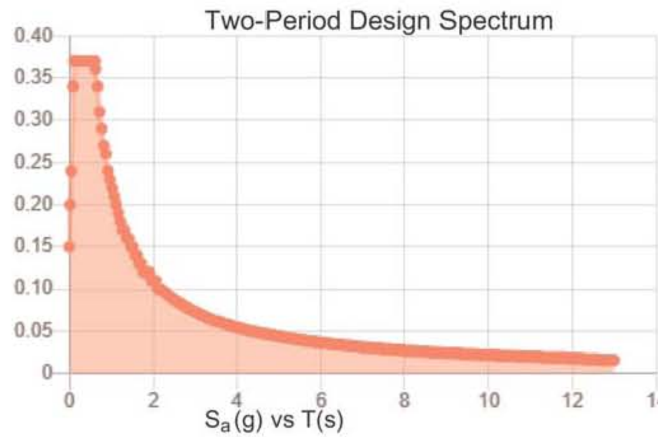
PGA_M :	0.25	T_L :	12
S_{MS} :	0.56	S_S :	0.5
S_{M1} :	0.33	S_1 :	0.16
S_{DS} :	0.37	V_{S30} :	260
S_{D1} :	0.22		

Seismic Design Category: D









MCE$_R$ Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Data Accessed: **Fri Mar 21 2025**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-22 and ASCE/SEI 7-22 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-22 Ch. 21 are available from USGS.

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Attachment G

NRCS Soil Survey Report

USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Montgomery County, Illinois

March 21, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

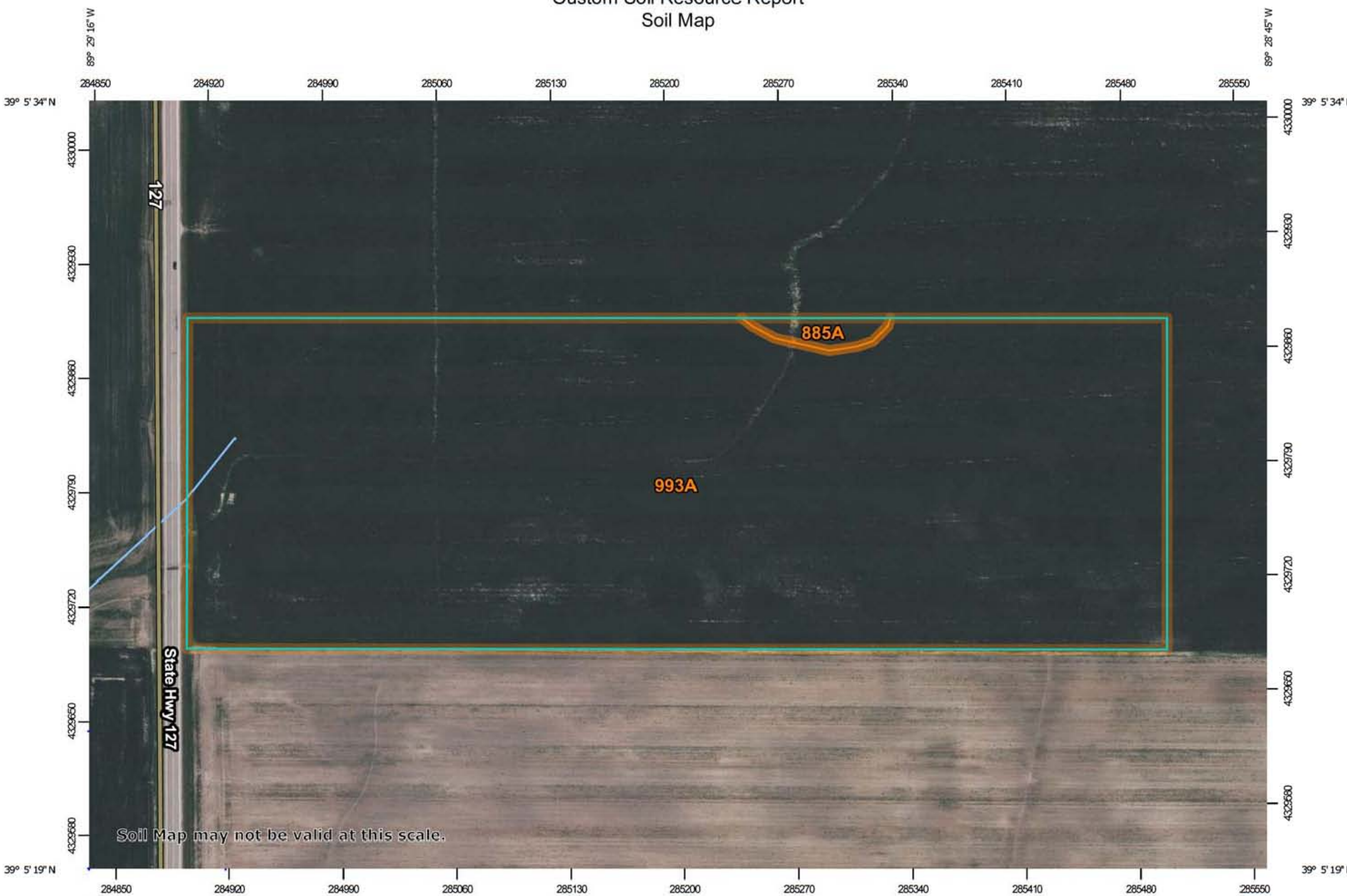
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map



Map Scale: 1:3,310 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 21, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	0.3	1.0%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	30.0	99.0%
Totals for Area of Interest		**30.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Montgomery County, Illinois

885A—Virden-Fosterburg silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1vs0t
Elevation: 340 to 1,000 feet
Mean annual precipitation: 37 to 45 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Virden and similar soils: 50 percent
Fosterburg and similar soils: 40 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Virden

Setting

Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loess

Typical profile

H1 - 0 to 15 inches: silt loam
H2 - 15 to 74 inches: silty clay loam
H3 - 74 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R114XB902IN - Wet Upland Prairie
Hydric soil rating: Yes

Description of Fosterburg

Setting

Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loess

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 20 inches: silty clay loam
H3 - 20 to 41 inches: silty clay loam
H4 - 41 to 71 inches: silty clay loam
H5 - 71 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

Minor Components

Piasa

Percent of map unit: 3 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

993A—Cowden-Piasa silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tbs0
Elevation: 330 to 840 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cowden and similar soils: 50 percent
Piasa and similar soils: 48 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cowden

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Eg - 8 to 19 inches: silt loam
Btg - 19 to 50 inches: silty clay loam
Cg - 50 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 17 to 21 inches to abrupt textural change
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D
Ecological site: R113XY903IL - Wet Upland Prairie
Hydric soil rating: Yes

Description of Piasa

Setting

Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Interfluve, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over silty pedisediment

Typical profile

Ap - 0 to 8 inches: silt loam
Eng - 8 to 12 inches: silt loam
Btng - 12 to 48 inches: silty clay loam
2BCng - 48 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 11 to 14 inches to natric
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

Minor Components

Darmstadt

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R113XY902IL - Natric Till Plain Savanna
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Corrosion of Concrete

ENG

Engineering

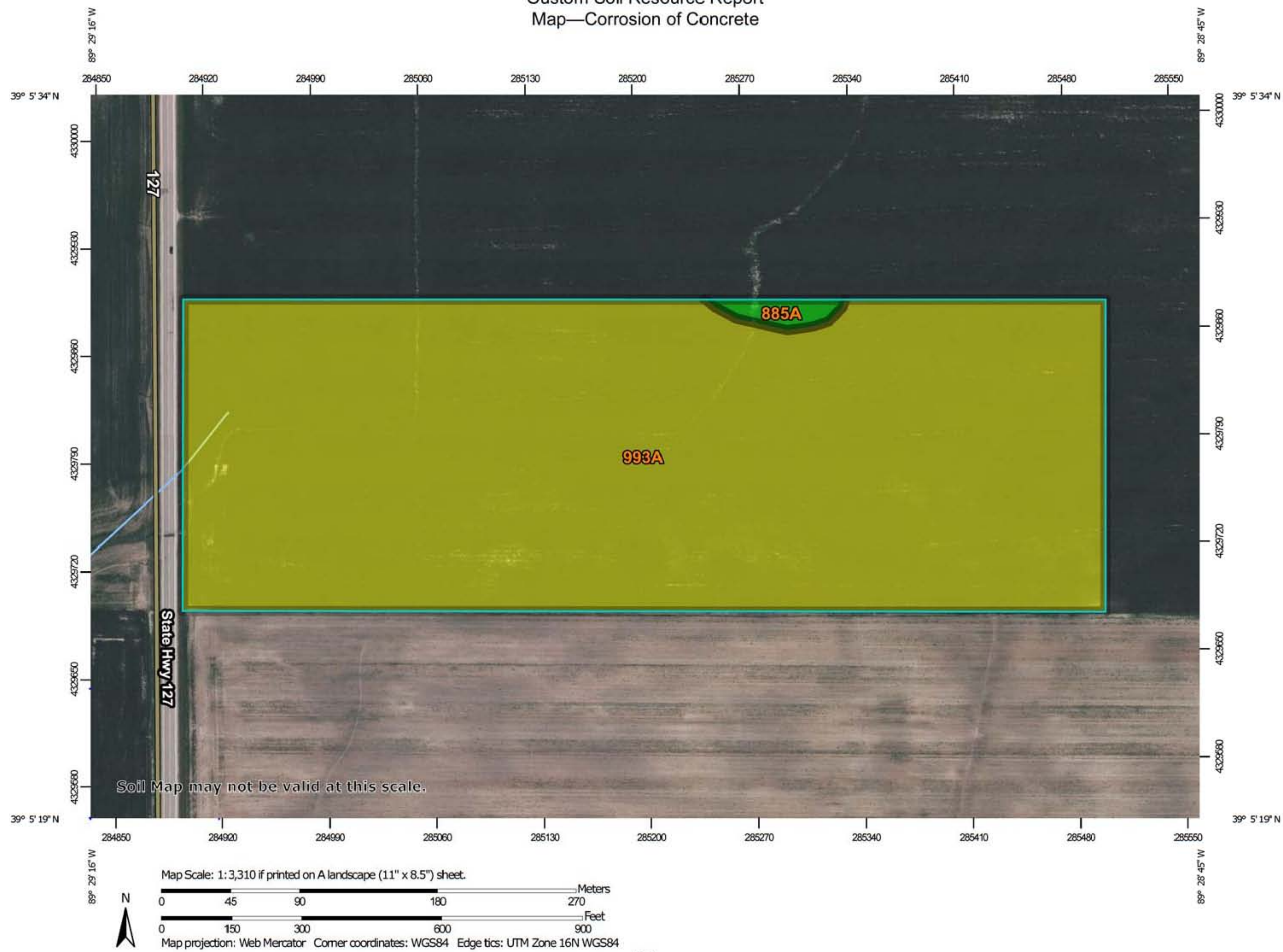
AGR

Agronomy

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Map—Corrosion of Concrete



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 21, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	Low	0.3	1.0%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	Moderate	30.0	99.0%
Totals for Area of Interest			**30.3**	**100.0%**

Rating Options—Corrosion of Concrete

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Corrosion of Steel

ENG

Engineering

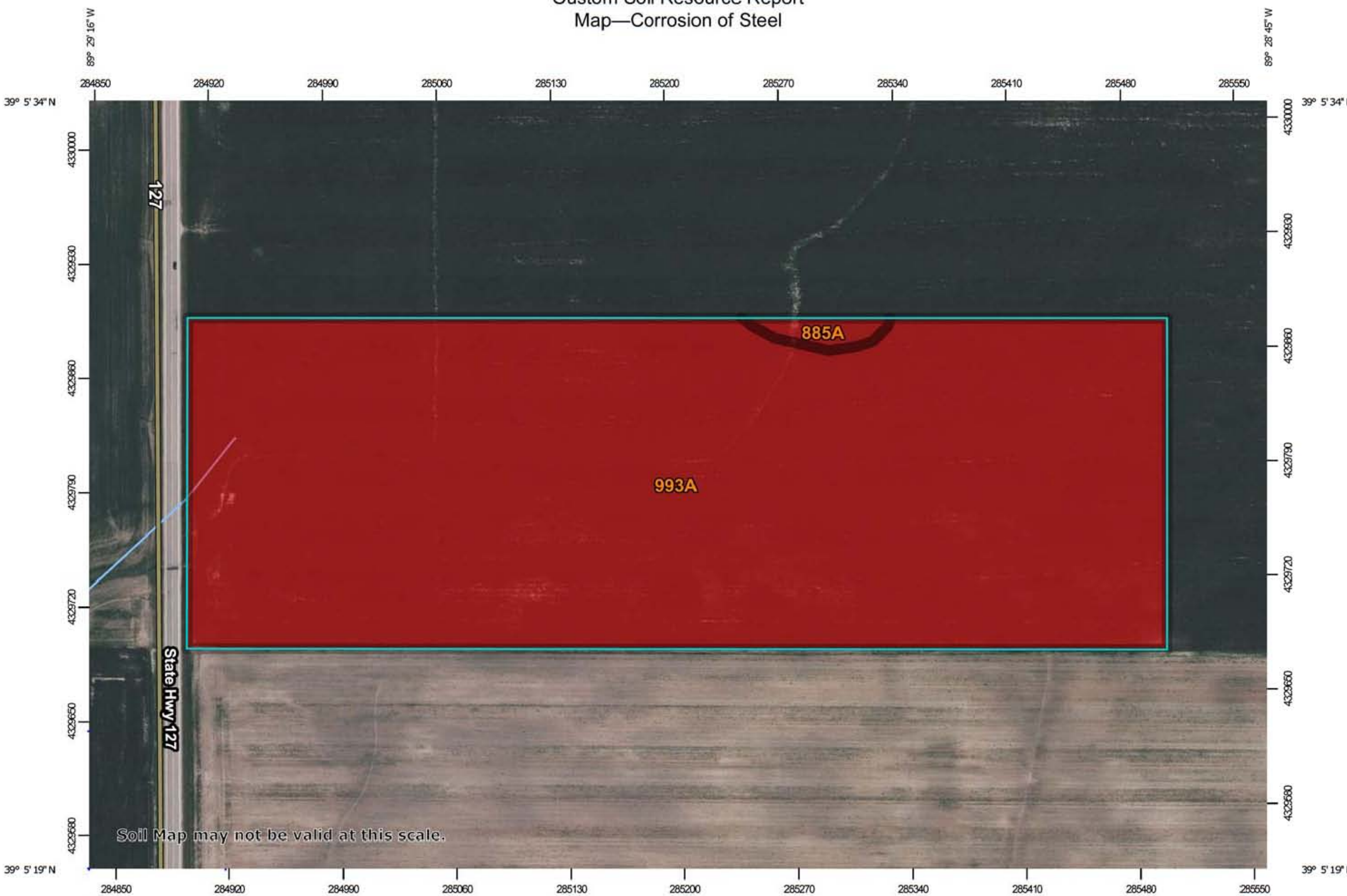
AGR

Agronomy

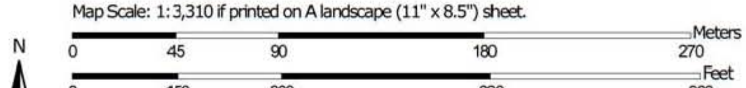
"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Map—Corrosion of Steel



Map Scale: 1:3,310 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

High

Moderate

Low

Not rated or not available

Soil Rating Lines

High

Moderate

Low

Not rated or not available

Soil Rating Points

High

Moderate

Low

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 21, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	High	0.3	1.0%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	High	30.0	99.0%
Totals for Area of Interest			**30.3**	**100.0%**

Rating Options—Corrosion of Steel

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

Erosion Hazard (Off-Road, Off-Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope, soil erosion factor K, and an index of rainfall erosivity (R). The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

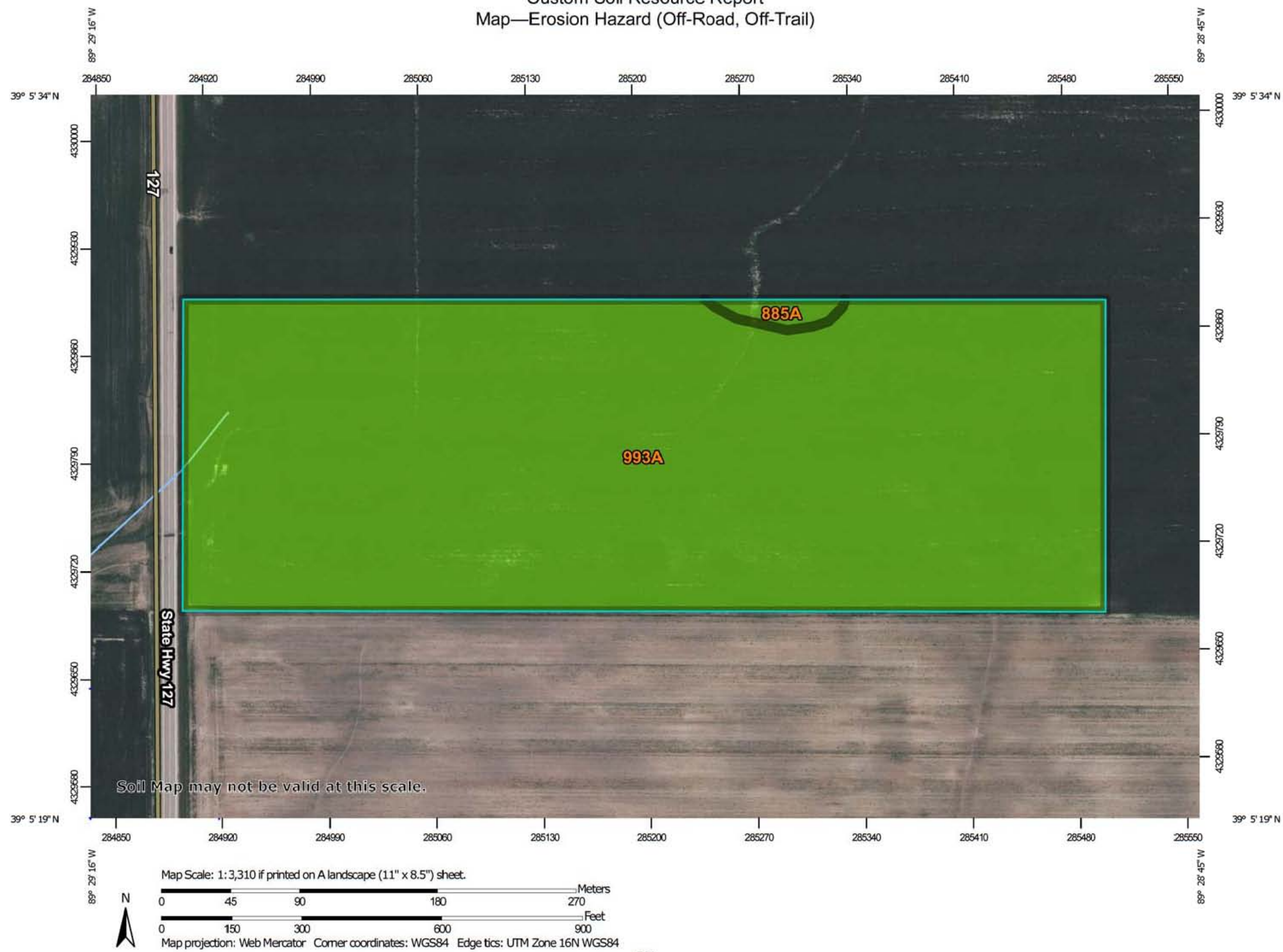
The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Erosion Hazard (Off-Road, Off-Trail)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 21, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Off-Road, Off-Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	Slight	Virden (50%)		0.3	1.0%
			Fosterburg (40%)			
			Piasa (3%)			
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	Slight	Cowden (50%)		30.0	99.0%
			Piasa (48%)			
			Darmstadt (2%)			
Totals for Area of Interest					**30.3**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Slight	30.3	100.0%
Totals for Area of Interest	**30.3**	**100.0%**

Rating Options—Erosion Hazard (Off-Road, Off-Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Erosion Hazard (Road, Trail)

FOR - Forestry

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

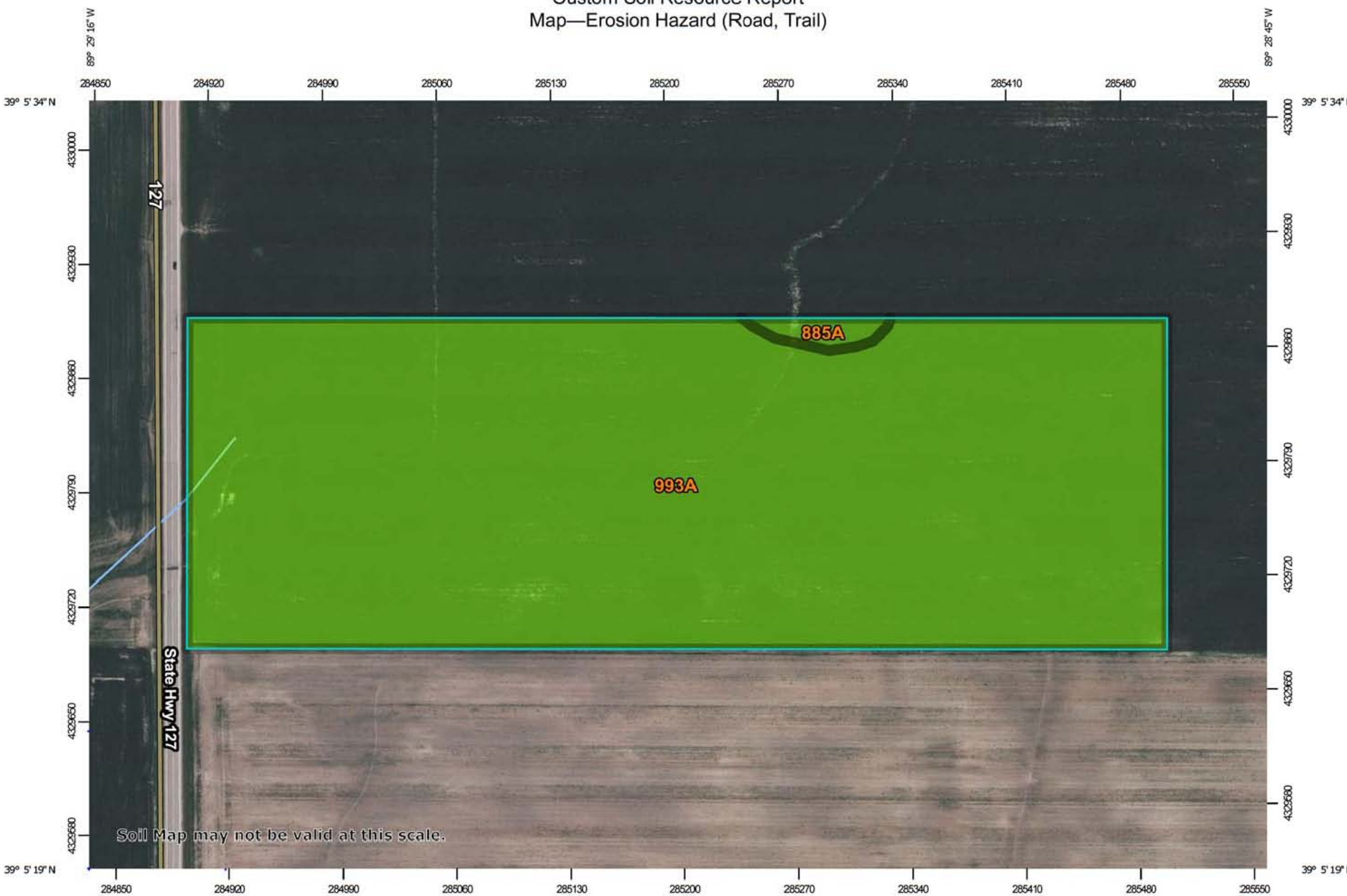
The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Map—Erosion Hazard (Road, Trail)



Map Scale: 1:3,310 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 45, 90, 180, 270

Feet: 0, 150, 300, 600, 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 21, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Erosion Hazard (Road, Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	Slight	Virden (50%)		0.3	1.0%
			Fosterburg (40%)			
			Piasa (3%)			
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	Slight	Cowden (50%)		30.0	99.0%
			Piasa (48%)			
			Darmstadt (2%)			
Totals for Area of Interest					**30.3**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Slight	30.3	100.0%
Totals for Area of Interest	**30.3**	**100.0%**

Rating Options—Erosion Hazard (Road, Trail)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

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ANS GEO

Exhibit N: Vegetation Management Plan

Vegetation Management Plan for

Atticus Solar, LLC

Prepared May 2025 by:

Natural Resource Services

Contents

1. Atticus Solar, LLC Vegetation Management Plan (VMP) Overview

1.1. Site Developer

Ironwood Renewables
910 Harding Street
LaFayette, LA 70503
337.889.3940

1.2. Site Address

State Route 127
Hillsboro, Montgomery County, IL 62049

1.3. Vegetation Restoration Consultant

Natural Resource Services, Inc
2885 Quail Road NE
Sauk Rapids, MN 56379
320.290.5363

and

16425 W. State Route 90
Princeville, IL 61559

1.4. Project Description

The proposed Atticus Solar project is a 5MW AC project planned for approximately 28.50 acres of land in Hillsboro Township, Montgomery County, Illinois. Tracker-style panels with approximately 30-36" ground clearance at max tilt and above-ground drivelines are planned. The site will be planted with a fully-native pollinator mix. No vegetative screening or stormwater basins are planned at this time.

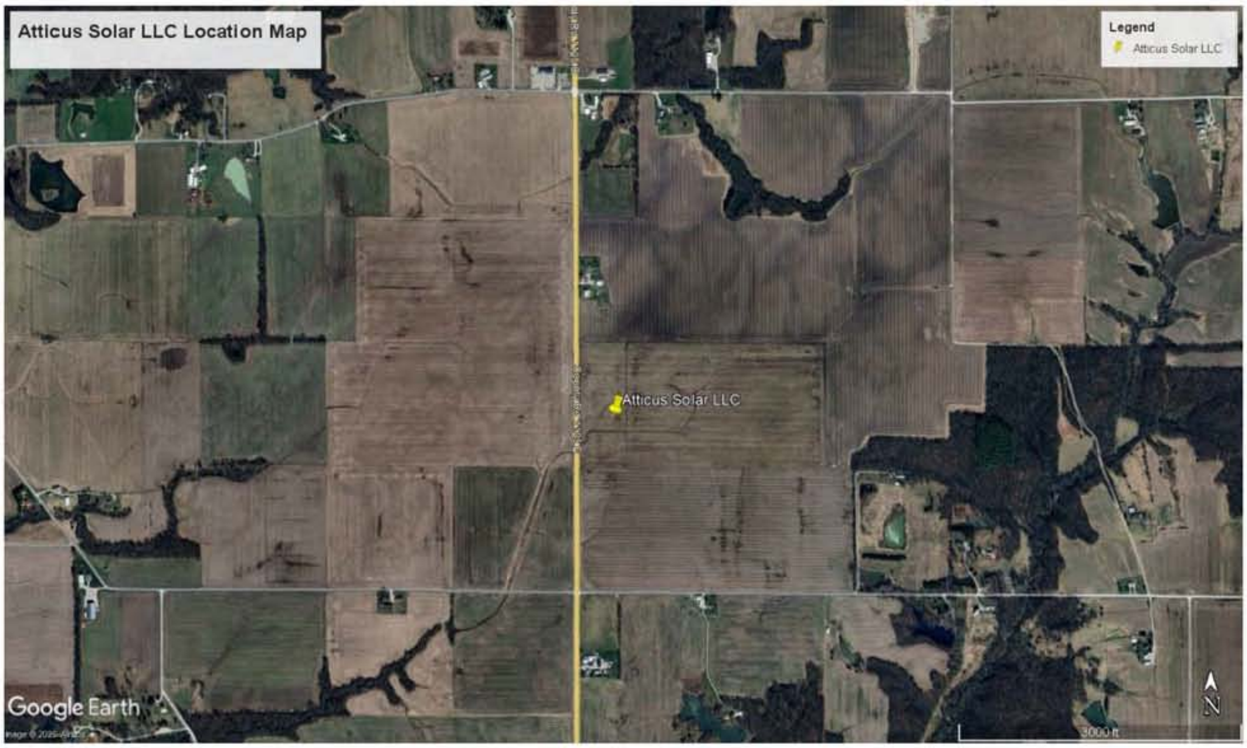
1.5. VMP Use and Objectives

The VMP was written to provide a brief overview and description of the project and to act as a guide for vegetation installation and management. It has been custom-written based on information known at the time of writing. The VMP should be treated as a living document and adjusted as additional information about the site is gathered both pre and post construction. A qualified native vegetation contractor with a history of success working on native vegetation restorations should be contracted to implement the procedures outlined in this document and to provide feedback and suggestions for the VMP during the lifespan of the project.

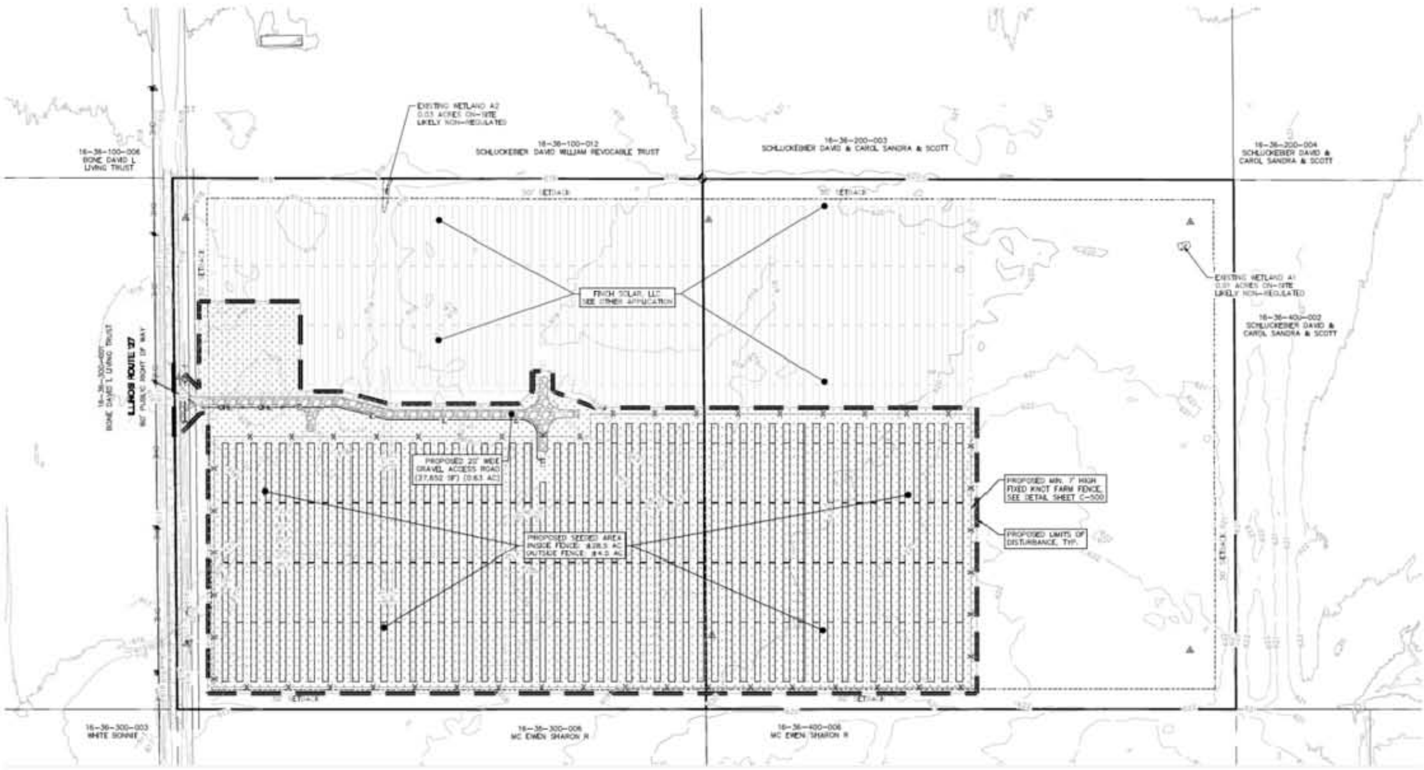
2. Site Information

2.1. Site Location

The Atticus Solar project is located on the east side of County Road 1125 E, about ¼ of a mile north of the intersection of N 6th Ave and County Road 1125E. Agricultural fields surround the Atticus Solar project as well as a forest to the east of the site. The GPS coordinates for Atticus Solar are 39.090125, -89.487338.



2.2. Map of Array Layout



2.3. Site Conditions

A review of historical aerial photos shows that the entire site has been in traditional agriculture for the last 30 years. No ponding can be seen in aerial photos. A review of the soils on the USDA/NRCS Web Soil Survey shows poorly drained soils, with 99.6% of the site ecologically classified as Cowden-Piasa silt loam and 0.4% as Virden-Fosterburg silt loam.

3. Overview of Vegetation Establishment and Management

3.1. Vegetative Goals

The primary vegetative goal is to establish permanent vegetation that does not interfere with solar production. This solar site is being planted with 100% native species. The species chosen produce an emphasis on native pollinator habitat to achieve and maintain

Pollinator Friendly status as defined in the Illinois Pollinator Friendly Solar Site Act (525 ILCS 55/) [1] .

3.2. Contribution of Native Habitat on Solar Sites

Economical production of power is the foremost goal of solar sites. There is a parallel opportunity to provide critically important native pollinator-friendly habitat throughout the array while capitalizing on the long-term low maintenance needs of native vegetation.

Establishing prairies and other native plant communities within the confines of solar sites provides a tremendous opportunity to restore ecosystems that have been severely degraded or eliminated across all areas of the country.

Native plants have profound root systems, many reaching 12 or more feet deep into the soil. Rainwater follows those roots into the ground, helping to reduce water runoff and promote the drainage of standing water into an aquifer. Those deep roots also stabilize the soil, preventing erosion from rain and wind. The plants provide seeds for songbirds, cover for game birds and, of course, provide blossoms and host plants for our beloved butterflies and other nectar-loving insects.

Native grasses and forbs will be selected based on their ecological appropriateness to the specific conditions of this site, with consideration to their mature height to not interfere with panel productivity. These species will not require irrigation, fertilizer, or other soil amendments.

The contribution to habitat restoration cannot be overstated given the acreage impacted and lifespan of the project.

3.3. Vegetation Installation Overview

The native mix planned for this array is selected for ecological appropriateness to the soil moisture, types and site conditions as well as the mature plant height of 24” to 36” so as to not interfere with panel productivity. The habitat provides low-maintenance vegetation that won’t require fertilizer, amended soils or irrigation on this site.

It is important to note that the species selected for this site are based on their ability to successfully establish from seed and thrive within the unique conditions found on solar

[1] https://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3900&ChapterID=44

sites. From a practical standpoint, the species contained in these mixes are generally available in the marketplace and, as a whole, have reasonable price points. Ultimately, the list consists of well-performing, workhorse species coupled with smaller amounts of more unique species for a robust mixture.

3.4. Vegetation Management Overview

Maintenance plays a vital role in the eventual success of any native landscape installation, especially during the establishment period of years one through three. Active management is similar in all areas of the project site. All areas of the site are inspected annually followed by maintenance necessary to encourage healthy native species while discouraging non-native/invasive species. During the growing season of the first year of establishment, the site shall be inspected a minimum of three times.

4. Vegetation Installation Procedures

4.1. Site Inspections and Monitoring

Site inspections and monitoring throughout the installation process are vital to continually assess site conditions and determine what procedures are needed and the timing of those procedures. The pre-construction site inspection is particularly important to determine the need for any herbicide application or mowing prior to soil preparation and seeding.

4.2. Site Preparation Herbicide Application

A site preparation herbicide application, if deemed necessary, should be performed by a licensed, qualified contractor using appropriate herbicides to kill all actively growing weeds on the project site. Typically, only glyphosate herbicide is necessary, but if certain perennial weed species are present such as Canada thistle, a broadleaf additive may be necessary. The contractor should carefully select an herbicide with a short soil residual, such as Garlon 3A, to minimize the impact on germination of the permanent seeding. The vegetation should not be disturbed for a minimum of 14 days after an herbicide application to allow time for effective weed elimination.

4.3. Site Preparation Mowing

Site preparation mowing may be required to reset vegetative growth to prepare for an herbicide application. Additionally, site preparation mowing may be needed to cut and mulch vegetation to simplify the soil preparation and seeding process.

4.4. Soil and Seedbed Preparation

Soil and seedbed preparation is vital to the success of any planting. Disking and harrowing (or raking) the site is common and extremely effective. If extreme compaction is present on site, a ripper may be needed to mitigate the compaction. The seedbed should be relatively smooth and firm prior to seeding. Soil that is too clumpy or too fluffy may result in seeds being planted too deep in the soil to germinate and survive.

4.5. Seed and Seeding

A custom native pollinator seed mix has been designed for use on this project and is found in Section 8. Seeding will be completed through broadcasting by using a mechanical spreader appropriate for the specified seed mixes. Large and fluffy seeds (such as most grasses and cover crop) should be broadcast first and then lightly harrowed/raked into the soil. Following the harrowing, small seeds (such as most forbs, sedges, and rushes) should be broadcast on top of the soil.

4.6. Erosion control

Erosion control measures should be implemented as required after permanent seeding is completed.

5. Vegetation Management Procedures

5.1. Adaptive Management

An adaptive management strategy is vital to the success of any project, but especially so for native pollinator restorations. Adaptive management consists of continual monitoring and adjusting maintenance strategies based on the site conditions in order to achieve the best outcomes. No two sites are exactly the same and responding to changing site conditions, weed pressures, weather, and a multitude of other variables is essential to the success of the planting.

5.2. Complete Site Maintenance Mowing

Complete site maintenance mowing consists of mowing the entire project area during the growing season, including trimming as appropriate around equipment or in inaccessible areas. Complete site maintenance mowing is implemented primarily during the establishment phase of the restoration (years 1-3) for several reasons. First, if a closed canopy of vegetation develops, mowing is implemented to knock back the taller vegetation and allow sunlight to reach the native seedlings below. Second, if weed species are present and actively nearing their seed set, mowing is implemented to prevent those weeds from producing viable seed. Third, vegetation has become tall enough to shade the panels or impact other solar equipment on site and must be cut down.

5.3. Integrated Vegetation Maintenance

Integrated vegetation maintenance or IVM is a method using a combination of targeted mowing/trimming and herbicide application aimed at reducing or eliminating weed species and promoting the desired vegetation. IVM can also include grazing, haying, and other maintenance options as appropriate. IVM is implemented starting towards the end of the 2^{nd} full growing season typically and is used throughout the life of the project. 3 IVM visits are typical on most sites until year 5 when a reduction to 1-2 visits per year can be made if site conditions allow.

5.4. Dormant Mowing

Dormant mowing is a type of complete site mow implemented when vegetation is not actively growing on site. This method is typically performed in early spring or fall. Oftentimes, dormant mows are completed in the fall to mulch up dead vegetation and encourage decomposition. This practice also has a dual purpose of cleaning up the site to make electrical maintenance easier and to reduce the chance of accidental fire.

6. Vegetation Installation and Management Timeline

6.1. Site Prep and Installation Phase

Site Preparation:

1. Prior to the start of construction, a cover crop may be seeded to aid in erosion control, soil moisture management, and weed suppression.
2. Inspection of the project area to assess site conditions and determine the need for any site prep mowing or spraying activities.
3. If necessary, an herbicide application will be completed using glyphosate (Round-up® or equivalent) as per manufacturer's directions in areas with actively growing

vegetation. Allow a minimum of 14 days before disturbing the soil or completing seeding activities.

4. When perennial broadleaf vegetation is present a triclopyr herbicide will be added (Garlon 3A® or equivalent) as per manufacturer's directions. When a broadleaf herbicide is used allow a minimum of 30 days before disturbing the site or completing seeding.
5. Depending on the density and type of undesirable vegetation present (i.e., annual vs perennial) a complete site mowing might be advisable in lieu of an herbicide application. For instance, if the site is dominated by Foxtail (an annual), mowing would be preferrable to an herbicide application.

Soil Prep and Seeding:

1. Construction debris, garbage, and building materials will be removed and/or staged outside the intended seeding areas.
2. Disk soil within the project area in preparation for seeding. Harrow or rake the soil to achieve the proper seedbed.
3. Broadcast the large and fluffy seed (mostly grasses) along with a cover crop of winter wheat or oats.
4. Harrow or rake the soil to work the seed to a proper depth.
5. Broadcast the small seeds (forbs, sedges, rushes, small grass seeds) on top of the soil.

Installation Phase Maintenance

If the site is seeded in the summer or early fall, 1-2 complete site mowings may be needed during this first partial growing season.

6.2. Establishment Phase

Year 1 is defined as the 1st full growing season for the vegetation. A recommendation of 3 complete site mowings is most common for this phase. Depending on site conditions and vegetation growth, more or less may be needed.

Year 2 is the second full growing season. 3 total visits are typical with 2 complete site mowings and 1 Integrated Vegetation Maintenance visit the most likely combination.

Year 3 typically requires 3 IVM site visits depending on vegetation status.

Maintenance Phase

Year 4 – 34. During the maintenance phase, 2 IVM visits are typical.

7. Monitoring

Consistent project monitoring is essential to evaluate vegetative establishment, weed presence, and possible erosion concerns. This information helps determine which management procedures to utilize, the proper timing for those procedures, and whether any other remedial action is required such as reseeding or replanting. As the site's vegetation matures, adaptive management should be utilized as previously described.

8. Seed Mix

Atticus Solar, LLC Native Pollinator Mix

Seeding Rate - 12.5 lb/acre - 78.5 seed/ft²

Common Name	Scientific Name	Bloom Month	% of Mix by Weight	Lbs/Acre	Seeds per ft²	% of Mix by Seeds/ft²
Sideoats Grama	Bouteloua curtipendula		35.84%	4.48	9.87	12.57%
Plains Oval Sedge	Carex brevior		2.57%	0.32	3.42	4.35%
Bicknell's Sedge	Carex bicknellii		1.36%	0.17	1.06	1.35%
Troublesome Sedge	Carex molesta		1.28%	0.16	1.47	1.87%
Brown Fox Sedge	Carex vulpinoidea		2.00%	0.25	9.18	11.70%
Silky Wild Rye	Elymus villosus		6.00%	0.75	1.51	1.93%
Little Bluestem	Schizachyrium scoparium		26.95%	3.37	18.56	23.64%
Prairie Dropseed	Sporobolus heterolepis		0.40%	0.05	0.29	0.37%
Graminoid Total			**76.39%**	**9.55**	**45.37**	**57.78%**
Common Yarrow	Achillea millefolium	Jun-Aug	0.36%	0.05	2.98	3.79%
Lead Plant	Amorpha canescens	Jun-Aug	0.98%	0.12	0.72	0.92%
Canada Anemone	Anemone canadensis	May-Jun	0.04%	0.01	0.02	0.02%
Wild Columbine	Aquilegia canadensis	Apr-Jun	0.04%	0.01	0.07	0.09%
Common Milkweed	Asclepias syriaca	Jun-Aug	0.63%	0.08	0.12	0.15%
Butterfly Milkweed	Asclepias tuberosa	Jun-Aug	0.32%	0.04	0.06	0.08%
Canada Milkvetch	Astragalus canadensis	Jun-Aug	1.08%	0.14	0.84	1.08%
Partridge Pea	Chamaecrista fasciculata	Jul-Sep	3.18%	0.40	0.39	0.50%
White Prairie Clover	Dalea candida	Jun-Sep	4.08%	0.51	3.56	4.53%
Purple Prairie Clover	Dalea purpurea	Jul-Sep	6.02%	0.75	4.98	6.34%
Cream Gentian	Gentiana flavida	Aug-Sep	0.04%	0.01	0.27	0.34%
Prairie Blazing Star	Liatris pycnostachya	Jul-Sep	0.48%	0.06	0.24	0.31%
Great Blue Lobelia	Lobelia siphilitica	Jul-Oct	0.04%	0.01	0.96	1.22%
Seedbox	Ludwigia alternifolia	Jun-Sep	0.08%	0.01	4.78	6.08%
Virginia Mountain Mint	Pycnanthemum virginianum	Jun-Sep	0.09%	0.01	0.95	1.20%
Black-eyed Susan	Rudbeckia hirta	Jun-Oct	1.92%	0.24	8.13	10.35%
Calico Aster	Symphyotrichum lateriflorum	Aug-Oct	0.04%	0.01	0.48	0.61%
Sky Blue Aster	Symphyotrichum oolentangiense	Aug-Oct	0.16%	0.02	0.57	0.73%
Ohio Spiderwort	Tradescantia ohiensis	May-Jul	0.24%	0.03	0.09	0.11%
Hoary Vervain	Verbena stricta	Jun-Sep	1.36%	0.17	1.74	2.22%
Golden Alexanders	Zizia aurea	Apr-Jun	2.40%	0.30	1.21	1.55%
Forb Total			**23.61%**	**2.95**	**33.15**	**42.22%**
Mix Total			**100.00%**	**12.50**	**78.51**	**100.00%**

May 2025
Central IL poorly drained silt loam soils mix

9. Pollinator Scorecard

Illinois Solar Site Pollinator Habitat Planning Form

Use this form as a draft before completing the *Illinois Planned Pollinator Habitat on Solar Sites Scorecard* online

In Between and Under Solar Panels

1. PLANNED PLANT DIVERSITY IN ROWS & UNDER SOLAR ARRAY (choose up to 2)
   - ☐ 4-6 species +5 pts
   - ☑ 7 or More species +8 pts
   - ☑ All Native Species (minimum 4 species) +10 pts

Perimeter and Buffer Area

2. VEGETATIVE BUFFER PLANNED ADJACENT TO THE SOLAR SITE (choose all that apply)
   - ☑ Buffer planned outside of array fencing +5 pts
   - ☐ Buffer is 30-49ft wide measured from array fencing +5 pts
   - ☐ Buffer is at least 50ft wide measured from array fencing +10 pts
   - ☐ Buffer has Native shrubs/trees that provide food for wildlife +5 pts

3. SEEDS USED FOR NATIVE PERIMETER & BUFFER AREAS (choose all that apply)
   - ☑ Mixes are seeded using at least 20 seeds per square foot of Pure Live Seed or 40 Seeds per square foot on slopes > 5% +10 pts
   - ☐ All seeds are from a source within 150 miles of site +5 pts
   - ☐ At least 2% milkweed cover is planned to be established from seeds/plants +5 pts

4. PLANNED # OF NATIVE SPECIES IN SITE PERIMETER & BUFFER AREA (species with more than 1% cover)(choose 1)
   - ☐ 5-10 species +2 pts
   - ☐ 10-15 species +5 pts
   - ☑ 16-20 species +10 pts
   - ☐ >20 species +15 pts

   Exclude invasive and non-native plant species from total

5. PLANNED PERCENT OF PERIMETER & BUFFER AREA DOMINATED BY NATIVE PLANT SPECIES (choose 1)
   - ☐ 26- 50 % +2 pts
   - ☐ 51-75 % +10 pts
   - ☑ More than 75% +15 pts

Whole Site

6. PLANNED PERCENT OF SITE VEGETATION COVER TO BE DOMINATED BY DESIRABLE WILDFLOWERS (choose 1)
   - ☑ 26- 50 % +2 pts
   - ☐ 51-75 % +10 pts
   - ☐ More than 75% +15 pts

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

7. PLANNED SEASONS WITH AT LEAST THREE BLOOMING NATIVE SPECIES PRESENT (choose all that apply)
   - ☑ Spring (April-May) +5 pts
   - ☑ Summer (June-August) +5 pts
   - ☑ Fall (September-October) +5 pts

8. HABITAT SITE PREPARATION PRIOR TO IMPLEMENTATION (choose all that apply)
   - ☑ Soil preparation done to promote germination and reduce erosion as appropriate for the site. +10 pts
   - ☐ Measures taken to control weeds prior to seeding +10 pts
   - ☐ None -10 pts

9. AVAILABLE HABITAT COMPONENTS WITHIN 0.25 MILES (choose all that apply)
   - ☐ Native bunch grass for bee nesting +2 pts
   - ☑ Native trees/shrubs for bee nesting +2 pts
   - ☐ Clean, perennial water sources +2 pts
   - ☐ Created habitat nesting features +2 pts

10. SITE PLANNING AND MANAGEMENT(choose all that apply)
    - ☑ Detailed establishment and management plan developed +10 pts
    - ☐ Signage legible at forty or more feet stating "pollinator friendly solar habitat" +3 pts

11. INSECTICIDE RISK (choose all that apply)
    - ☐ Planned on-site use of insecticide or pre-planting seed/plant treatment (excluding buildings/electrical boxes, etc.) -40 pts
    - ☐ Communication/registration with local chemical applicators or on www.fieldwatch.com to prevent drift +5 pts

Total Points: 97

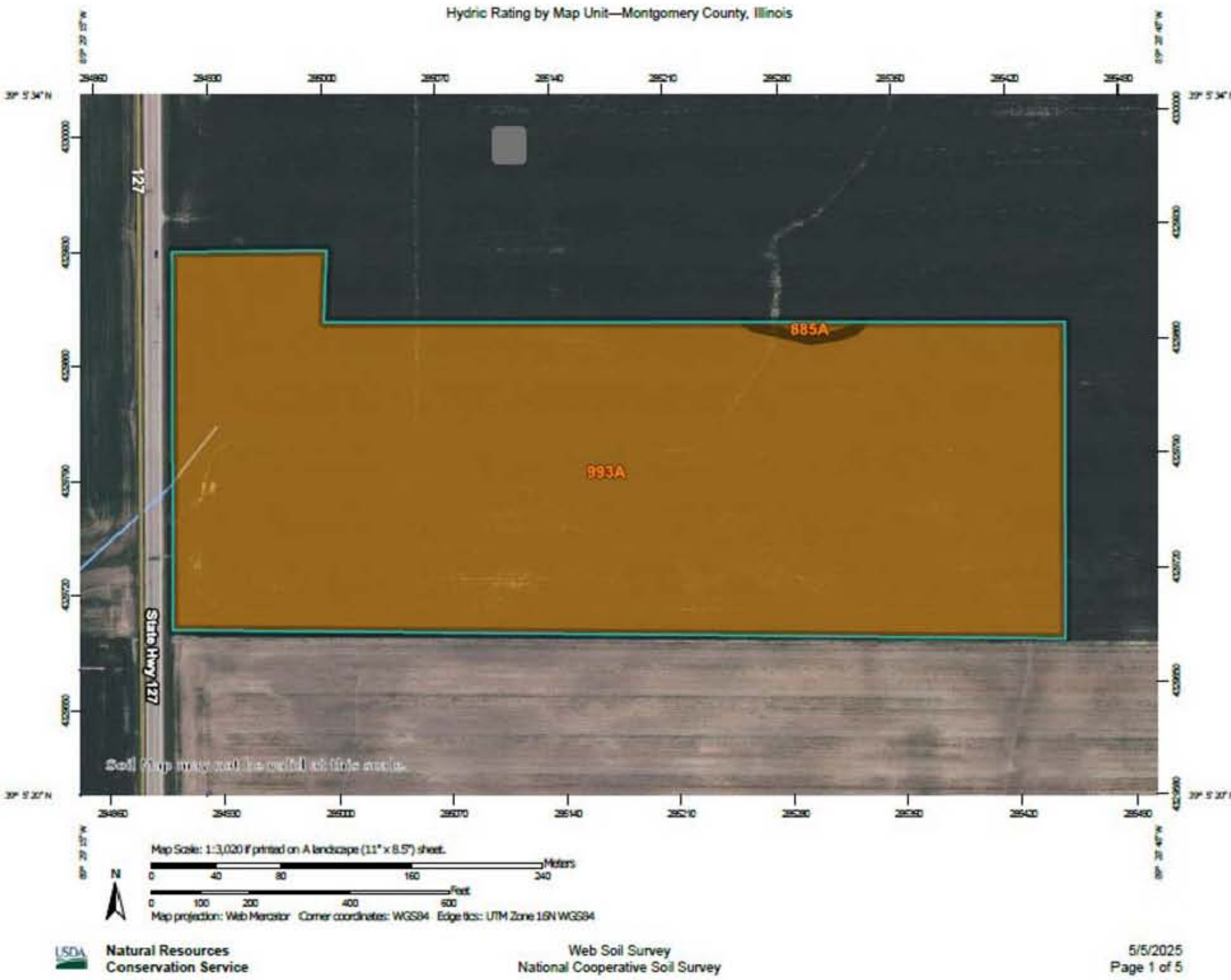
Meets Preliminary Pollinator Standards - 85
Provides Exceptional Habitat - 110 and higher

Owner: Atticus Solar, LLC
Vegetation Consultant: Natural Resource Services, Inc
Project Location: Hillsboro Township, IL
Project Size: 28.50 **acres**
Final Seeding Date: 2026

This form is designed (with the help of the Solar Site Pollinator Guidelines found on IDNR's website) to guide owners or managers of solar sites to meet the requirements to be able to claim a site is pollinator friendly according to the "Pollinator Friendly Solar Site Act (525 ILCS 55)". This form is for company records only and does not grant the title of a Pollinator Friendly Solar Site until the "Illinois Planned Pollinator Habitat on Solar Sites Scorecard" is completed with a score of 85 or higher on IDNR's website. This preliminary recognition is good for 3yrs, after which the "Established Pollinator Habitat on Solar Sites Scorecard" will need to be completed every 5 years to maintain recognition as a Pollinator Friendly Solar Site.

12/3/2019

10. Soils Maps



Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	93	0.1	0.4%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	98	26.9	99.6%
Totals for Area of Interest			**27.0**	**100.0%**

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points

- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 21, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Exhibit O: List of Neighbors

Property Owner Name	Property Tax Address	Property Tax PIN #
	74 Arrowhead Ln	16-36-300-006
Sharon R. McEwen	Litchfield, IL 62056	16-36-400-006
	11325 N 6th Ave.	
Forrest W. DeLong	Hillsboro, IL 62049	16-36-400-005
	199 Oak Ln	
Bonnie L. White	Coffeen, IL 62017	16-36-300-003
	311 Hilltop Ln	16-36-100-006
David L. Bone Living Trust	Staunton, IL 62088	16-36-300-001
	14099 Mt Moriah Ave	
David William Schluckebier Revocable Trust	Donnellson, IL 62019	16-36-100-012
	6252 Illinois Route 127	
Scott & Cheryl Adams Merano	Hillsboro, IL 62049	16-36-100-011
		16-36-400-002
	14099 Mt Moriah Ave	16-36-200-004
David & Carol Sandra & Scott Schluckebier	Donnellson, IL 62019	16-36-200-003

IRONWOOD
RENEWABLES

Exhibit P: Roadway Coordination Correspondence

IRONWOOD
RENEWABLES

Ironwood Renewables
c/o Keith Morel
910 Harding St.
Lafayette, LA 70503

April 25, 2025

IDOT Region 4 Engineer
126 East Ash
Springfield, IL 62704

RE: Atticus Solar, LLC
Off of Illinois State Route 127 in Hillsboro Township, Montgomery County, Illinois
PIN(s): 16-36-400-001 & 16-36-300-002

Dear IDOT,

Ironwood Renewables, LLC, on behalf of Atticus Solar, LLC (collectively, the "Applicant"), intends to submit a Solar Farm Development Permit Application to Montgomery County for the proposed Atticus solar project. The Project is a proposed 5 MW solar farm located on agricultural land in Hillsboro Township, Montgomery County, Illinois, near Illinois State Route 127. The Project site consists of portions of two contiguous parcels currently used for active farming and totals approximately 33.7 acres. Surrounding land uses include agricultural fields in all directions, with Illinois State Route 127 bordering the western side of the property. The Project proposes one (1) access point off Illinois State Route 127, with electricity generated by the facility delivered to the Ameren utility corridor adjacent to the site.

The anticipated delivery route for construction vehicles (assuming WB-67 semi-trucks) will primarily utilize Interstate 55, Interstate 70, State Route 16, State Route 140, and State Route 127 within IDOT District 6.

The Applicant is seeking a Solar Farm Development Permit from Montgomery County with a target construction start following the 2026 harvest season. Before applying for the building permit, the Applicant will initiate coordination with your office to review roadway impacts, submit any required surveys, and finalize a roadway use agreement in connection with the building permit issuance.

Should you have any questions or require additional information, please feel free to contact me at 337-889-3940 or kmorel@ironwoodenergy.com. We appreciate your time and look forward to working together on this project.

Sincerely,

Keith Morel
Project Developer
Atticus Solar, LLC

IRONWOOD
RENEWABLES

Ironwood Renewables
c/o Keith Morel
910 Harding St.
Lafayette, LA 70503

April 25, 2025

Ethan A. Murzynski
Hillsboro Township Highway Commissioner
807 Montgomery Ave
Hillsboro, IL 62049

RE: Atticus Solar, LLC
Off of Illinois State Route 127 in Hillsboro Township, Montgomery County, Illinois
PIN(s): 16-36-400-001 & 16-36-300-002

Dear Mr. Murzynski,

Ironwood Renewables, LLC, on behalf of Atticus Solar, LLC (collectively, the "Applicant"), intends to submit a Solar Farm Development Permit Application to Montgomery County for the proposed Atticus solar project. The Project is a proposed 5 MW solar farm located on agricultural land in Hillsboro Township, Montgomery County, Illinois, near Illinois State Route 127. The Project site consists of portions of two contiguous parcels currently used for active farming and totals approximately 33.7 acres. Surrounding land uses include agricultural fields in all directions, with Illinois State Route 127 bordering the western side of the property. The Project proposes one (1) access point off Illinois State Route 127, with electricity generated by the facility delivered to the Ameren utility corridor adjacent to the site.

The anticipated delivery route for construction vehicles (assuming WB-67 semi-trucks) will primarily utilize Interstate 55, Interstate 70, State Route 16, State Route 140, and State Route 127 within IDOT District 6.

The Applicant is seeking a Solar Farm Development Permit from Montgomery County with a target construction start following the 2026 harvest season. Before applying for the building permit, the Applicant will initiate coordination with your office to review roadway impacts, submit any required surveys, and finalize a roadway use agreement in connection with the building permit issuance.

Should you have any questions or require additional information, please feel free to contact me at 337-889-3940 or kmorel@ironwoodenergy.com. We appreciate your time and look forward to working together on this project.

Sincerely,

Keith Morel
Project Developer
Atticus Solar, LLC

IRONWOOD
RENEWABLES

Exhibit Q: Property Value Impact Summary

This appendix provides a summary of recent academic and government-backed studies that evaluate the impact of solar energy projects on nearby property values, with a specific focus on community-scale and Midwestern installations.

1. Hao & Michaud (2024)

Title: Assessing Property Value Impacts Near Utility-Scale Solar in the Midwestern United States
Authors: Simeng Hao and Gilbert Michaud
Published: December 2024, Solar Compass
Link: https://www.researchgate.net/publication/383850654

Summary: This peer-reviewed study analyzed 70 solar installations (5–150 MW) across ten Midwestern states. Using Zillow Zestimate data and a difference-in-differences approach, the researchers found no evidence of negative property value impacts. Projects between 5 and 20 MW showed neutral to slightly positive value trends. The study emphasized that smaller, community-oriented solar farms tend to integrate well with the surrounding landscape.

2. Lawrence Berkeley National Laboratory (2020)

Title: Shedding Light on Large-Scale Solar Impacts
Authors: Ben Hoen et al.
Published: 2020
Link: https://emp.lbl.gov/publications/shedding-light-large-scale-solar

Summary: This nationwide study analyzed 1.8 million real estate transactions across six U.S. states. It found no statistically significant evidence that proximity to large-scale solar projects reduced home sale prices. The findings remain one of the most comprehensive and widely cited assessments of solar-related property impacts.

Both studies support the conclusion that the proposed 5 MW community solar project will not adversely affect the value of neighboring properties. The evidence points to neutral or positive trends, especially for projects of this size in rural, agriculturally oriented communities.

Exhibit R: Preliminary Stormwater Pollution Prevention Plan

STORMWATER POLLUTION PREVENTION PLAN

Atticus Solar, LLC

State Route 127, Hillsboro, Montgomery County, Illinois 62049

Prepared by:
Ironwood Renewables, LLC
910 Harding St.
Lafayette, LA 70503

IRONWOOD
RENEWABLES

Table of Contents

Attachments

1. STORMWATER POLLUTION PREVENTION PLAN

The responsible party for the implantation, maintenance and inspection described in this Stormwater Pollution Prevention Plan is:

(Contractor Operator and/or Responsible Authority) (Date)

(Contractor Company Name) (Date)

(Contractors Address) (Telephone)

Project Name and Location Information	Atticus Solar, LLC State Route 127, Hillsboro Montgomery County, Illinois 62049

2. SITE DESCRIPTION

2.1 Project Description

The 33.7-acre project is located east of IL State Route 127 in Montgomery County, IL, and will include solar panels, inverters, transformers, fencing, gates, and an access road.

2.2 Existing Soils

NRCS classifies on-site soils as Cowden-Piasa silt loams (993A) and Virden-Fosterburg silt loams (885A), both with 0–2% slopes. These soils are poorly drained and rated as Hydrologic Soil Groups C/D and D. See Attachment 7 for the full NRCS Soil Map.

2.3 Existing Site Description

The existing site is currently used for agricultural purposes.

2.4 Adjacent Areas

The site is bordered by farmland to the north, south, east and west, and by Illinois State Route 127 to the West.

2.5 Project Name and Location

Atticus Solar, LLC
Illinois State Route 127
Hillsboro, Montgomery County, IL 62049

2.6 Owner Name and Location

Ironwood Projects, LLC
910 Harding St.
Lafayette, LA 70503

3. GENERAL SOIL DISTURBING ACTIVITIES

Site clearing and grubbing will begin first. Additional excavation and backfill for access roads and electrical pads, along with minor grading and topsoil placement, will follow.

4. CONSTRUCTION SEQUENCE

1. Establish a stabilized entrance for construction traffic.
2. Set up temporary staging and parking areas after placing essential components such as site trailers, vehicle parking, laydown areas, restrooms, wheel wash stations, concrete washout, fuel and material storage, and waste disposal containers. Mark these on the site plans and update as needed throughout construction.
3. Install erosion control measures such as filter socks, permanent swales/berms, sediment basins, or other approved BMPs.
4. Proceed with necessary clearing and grubbing. Apply temporary seeding to inactive disturbed areas expected to remain idle for seven (7) days or more, or as specified by the general permit.
5. Begin stabilization of exposed soil areas immediately to minimize erosion. This must be

completed within seven (7) days of the suspension (temporary or permanent) of activity in that area.
6. Initiate grading, access road construction, pile installation, racking setup, solar panel installation, fence construction, utility pole placement, overhead wiring, and trenching for underground utilities.
7. Complete final seeding and stabilization in line with the landscape plan (by others). After grading and seeding, install filter socks within the array area.
8. All temporary stockpiles must be removed as part of the final stabilization process.
9. Dismantle temporary erosion and sediment controls only after full site stabilization and county approval.

> **Note:** The above construction sequence is a general outline meant to reflect the intent of the erosion and sediment control strategy. It is not intended for direct implementation. The contractor is fully responsible for developing the detailed construction phases and sequencing required to complete the improvements described in these plans. If clarification or further guidance is needed, the contractor must promptly notify the engineer in writing. Compliance with all applicable regulations and the requirements of the Authority Having Jurisdiction remains the contractor's sole responsibility.

5. CONSTRCTION PHASE BEST MANAGEMENT PRACTICES

During construction, the General Contractor will be responsible for implementing the following practices:

- Filter sock or silt fencing will be placed throughout the site as needed to control soil movement and prevent sediment from leaving the property.
- Stormwater sediment controls will be installed at both inlet and outlet points of the proposed drainage system.
- Traffic-related sediment controls, such as stabilized entry points and designated concrete washout areas, will be maintained to manage construction vehicle impacts.
- Soil and debris generated from clearing, grubbing, or excavation will be stockpiled uphill from functional sediment controls. Temporary seeding with quick-germinating species will be applied to areas, including soil piles, that will remain undisturbed for more than 14 days. Off-site stockpile relocation must include proper erosion protection and permitting.
- Equipment cleaning, servicing, and maintenance areas will be identified by the General Contractor and enclosed with temporary berms to contain any spills.
- Large-scale washing using soaps or detergents (e.g., for vehicles, structures, or pavement) is not allowed.
- Hazardous substances such as paints, chemicals, solvents, and fertilizers must be stored in sealed, weather-resistant containers. When not in use, they should remain in enclosed vehicles or designated storage facilities. Any runoff containing these substances must be captured, removed from the site, and properly disposed of at an approved chemical or solid waste facility.

6. SOIL STABILIZATION

The goal of soil stabilization is to prevent erosion and keep sediment contained within the project site. Naturally, this is achieved through existing vegetation. For this project, stabilization will primarily be achieved by establishing turf grass or paving asphalt access roads to act as ground cover.

- **Temporary Seeding** – Any disturbed area where work is paused for more than 14 days must be temporarily stabilized with quick-growing seed or mulch within 7 days of inactivity.
- **Permanent Seeding** – Once areas reach final grade, they must be permanently seeded within 14 days of completing major construction. Mulch should be applied to protect seeded areas, especially on sloped ground or non-flat surfaces.

7. EROSION AND SEDIMENT CONTROLS

1. **Silt Fence** – A silt fence consists of a permeable synthetic fabric supported by wooden stakes, spaced appropriately to support the fence and the sediment it retains. Some versions include a wire backing for extra support. These fences are meant to slow down sediment-laden runoff, allowing solids to settle before the water filters through. Silt fences should be placed downslope to intercept low-velocity sheet flow and are effective for drainage areas up to 0.25 acres per 100 feet of fencing.
2. **Filter Sock** – Filter socks are tubes filled with biodegradable compost material, staked securely on the downslope side. Like silt fences, they allow sediment in runoff to settle out before water passes through the media and continues downstream.
3. **Construction Entrance/Exit** – Entry and exit points to the site from public roads must include stabilized pads made of coarse stone, as detailed in the construction plans. The rough surface helps dislodge soil from vehicle tires through vibration and friction as equipment moves over it.
4. **Concrete Washout Area** – A designated on-site zone used to rinse out concrete trucks and mixers after use. This area captures both solids and liquid waste, preventing pollutants from leaving the site and making cleanup easier.
5. **Erosion Control Blanket** – A temporary rolled product made from natural or synthetic fibers bound into a continuous mat. It's designed to control erosion and help vegetation take root while gradually degrading over time.

8. WASTE DISPOSAL

8.1 Erosion and Sediment Materials

Sediment collected behind silt fences or dikes will be redistributed on site and left to dry. Nearby paved roads at the site entrance will be swept as needed to remove any mud, debris, or stone tracked by construction vehicles. All dump trucks transporting material off-site must be covered with tarps.

8.2 Construction Waste Materials

All construction debris will be collected in a covered metal dumpster provided by a licensed waste management company. The container must comply with all applicable county and state regulations. It will be emptied regularly, following proper disposal procedures. The Owner will ensure all workers are trained on correct waste disposal practices, with signage posted on site to reinforce the policy. No solid waste may be discharged from the site through stormwater runoff.

8.3 Hazardous Wastes

All hazardous materials will be handled and disposed of in accordance with local, state, and manufacturer guidelines. The Owner will ensure all personnel are trained on proper handling procedures, and the policy will be clearly posted on site.

8.4 Sanitary Waste

All construction personnel are required to follow applicable state and local regulations regarding sanitation and septic systems. Temporary restrooms will be available on-site for the duration of construction and must be used by all workers. These facilities will be maintained by a licensed service provider.

9. MAINTENANCE PLAN

The following inspection and maintenance procedures will be followed to ensure erosion and sediment controls remain effective:

- All erosion and sediment control measures will be checked weekly and within 24 hours after any rainfall of 0.25 inches or more.
- If any control devices are found to be damaged or failing, repairs or corrective actions must begin immediately.
- Silt fences will be reviewed for sediment accumulation, breaches, or other signs of malfunction.
- Sediment must be cleared from control structures once it reaches half the height of the barrier.
- Stabilized entrances and exits will be checked for buildup that may block proper drainage through the rock.
- Roadways will be monitored for sediment tracked off-site by construction vehicles.
- Inspections will also include disturbed areas and exposed material storage zones for signs that pollutants could enter the drainage system. Covers must be installed, repaired, or replaced as needed, and berms may be constructed to contain runoff from these areas.
- Vegetated areas will be checked to ensure grass is healthy and well established. Final stabilization is considered complete when all areas are either paved or have at least 70% grass coverage. Irrigation, fertilization, and reseeding will be done as needed to reach this goal.
- All discharge points must be reviewed to verify that erosion controls are successfully protecting nearby water resources from significant sediment impacts.

10. MATERIALS MANAGEMENT PRACTICES

10.1 Guidelines

To minimize the risk of spills or unintentional exposure of materials to stormwater, the following material handling procedures will be implemented throughout construction:

The following housekeeping measures will be observed on site:

1. Only the amount of material necessary to complete tasks will be stored on-site.
2. Materials will be organized and stored in their appropriate containers, preferably under cover or within an enclosed area when feasible.
3. Products will remain in their original packaging with manufacturer labels intact.
4. Materials will not be combined unless specifically approved by the manufacturer.
5. When possible, containers will be fully emptied before being discarded.
6. All products will be used and disposed of according to manufacturer guidelines.
7. The site superintendent will perform daily inspections to ensure materials are being properly used and discarded.

These practices are intended to minimize risks associated with the materials listed below.

10.2 Petroleum Products and Fuels

All vehicles and equipment on-site will be routinely checked for leaks and maintained as part of a preventative maintenance schedule. Petroleum-based products will be stored in sealed, labeled containers in compliance with all applicable local and state regulations.

10.3 Paints

All containers must be kept tightly closed and properly stored when not in use. Surplus paint shall not be disposed of through the stormwater system and must be handled in accordance with local and state regulations.

10.4 Fertilizers

If fertilizer application is necessary, it will be limited to the minimum amount needed. All fertilizer products will be stored in an enclosed shed or trailer, and any opened bags must be kept in sealable plastic containers.

10.5 Concrete Trucks

Concrete trucks are prohibited from washing out or discharging excess concrete or rinse water anywhere on the project site.

The following spill response practices are intended to minimize the risks associated with handling and cleanup:

1. Cleanup procedures recommended by product manufacturers must be clearly posted, and all site personnel will be informed of both the procedures and the location of related supplies.
2. Spill response materials and equipment will be stored in the designated material storage area. Supplies may include items such as absorbents (e.g., kitty litter or sand), gloves, goggles, rags, brooms, dustpans, mops, and clearly labeled disposal containers.
3. Any spill must be addressed and cleaned up immediately upon detection.
4. The affected area must be well ventilated, and workers should use appropriate personal protective equipment to avoid contact with hazardous materials.
5. Spills involving hazardous or toxic substances must be promptly reported to the appropriate regulatory agencies.
6. Spill prevention procedures must be reviewed and updated as needed to help prevent similar incidents in the future.
7. The site superintendent will assign specific personnel responsible for spill cleanup. These individuals must receive appropriate training to perform their duties safely and effectively.

11. INSPECTIONS

Qualified personnel must conduct inspections of disturbed areas that have not yet reached final stabilization, all structural control measures, and all vehicle entry/exit points at least once every seven calendar days and within 24 hours following any storm event producing 0.25 inches or more of rain (or an equivalent snowfall). "Qualified personnel" refers to individuals knowledgeable in erosion and sediment control practices—such as a licensed professional engineer or another trained individual capable of evaluating site conditions that could affect stormwater quality, as well as the performance of implemented control measures.

All disturbed areas and material storage zones exposed to precipitation must be inspected for signs—or the likelihood—of pollutants entering the stormwater system. Erosion and sediment controls identified in the SWPPP must be checked to confirm they are functioning properly. When accessible, discharge locations must be reviewed to verify that control measures are effectively minimizing impacts to receiving waters. Access points to the site must also be inspected for signs of sediment tracking onto public roads or adjacent areas.

If any deficiencies or potential pollution sources are identified during inspections, the SWPPP must be updated accordingly. Revisions to control measures or site practices must be implemented as soon as practicable, but no later than seven calendar days following the inspection.

A detailed inspection report must be prepared and retained with the SWPPP. This report must include the inspection scope, the name(s) and qualifications of the inspector(s), inspection dates, observations on SWPPP implementation, and any corrective actions taken. These records must be kept for at least three years following the expiration or termination of permit coverage.

If a violation of the SWPPP is identified—whether during a required or voluntary inspection—the permittee must submit an "Incidence of Noncompliance" (ION) report to the Agency within five (5) days. This report must be completed on official Agency forms and include: the cause of the violation, steps taken to correct and prevent recurrence, any resulting environmental impacts, and the signature of a responsible party. The completed ION must be submitted to the address specified on the form.

12. FINAL MAINTENANCE

The contractor is responsible for maintaining all erosion and sediment control measures shown in this plan until the site has been fully stabilized, ensuring they continue to function as intended.

All temporary erosion and sediment control best management practices (BMPs) must be removed within 30 days of achieving final site stabilization or once they are no longer needed. Any sediment collected by these measures will be removed and stabilized on-site. Any ground disturbed during the removal of BMPs or associated vegetation must be permanently stabilized as soon as feasible.

Once the site has reached final stabilization and all stormwater discharges associated with construction activities have ceased, the permittee must submit a completed *Notice of Termination (NOT)*. For the purposes of this plan, final stabilization means that all disturbed soil areas have been permanently stabilized and all temporary controls have been removed—or are scheduled for removal at the appropriate time—or that all construction-related discharges covered under the NPDES general permit have been eliminated. The NOT must be signed by an authorized representative and submitted to the Agency at the address listed on the form.

Attachment 1 – SWPPP Preparation Certification Form

SWPPP Preparer's Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature Date

Name:	Michael Keith, P.E.
Title:	Project Manager
Company Name:	Atwell, LLC
Address:	1250 E. Diehl Rd. Suite 300
City, State:	Naperville, IL
Phone Number:	630.281.8424

Attachment 2 – Owner's Certification Form

Owner's Certification

(to be duplicated and signed by the owner)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature ______________________________ Date ____________

Name: ______________________________

Title: ______________________________

Company Name: ______________________________

Address: ______________________________

City, State: ______________________________

Phone Number: ______________________________

Attachment 3 – Contractor’s Certification Form

Contractor's Certification

(to be duplicated and signed by each contractor or subcontractor)

This SWPPP must clearly identify, for each measure identified within the SWPPP, the contractor(s) or subcontractor(s) that will implement each measure. All contractor(s) and subcontractor(s) identified in the SWPPP must sign the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

____

Signature   Date

Name: ______________________________________

Title: ______________________________________

Company Name: ______________________________________

Address: ______________________________________

City, State: ______________________________________

Phone Number: ______________________________________

Attachment 4 – Aerial Map

LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

EXISTING CULVERT

EXISTING WETLAND (LIKELY NON-REGULATED)

EXISTING WATERCOURSE (CENTERLINE)

EXISTING WATERCOURSE (TOP OF BANK)

NOTE: THIS ILLUSTRATION IS AN APPROXIMATE DEPICTION OF THE WETLANDS THAT APPEAR TO BE LOCATED ON THE SUBJECT PROPERTY AS DELINEATED BY ATWELL ON FEBRUARY 18TH, 2025. USACE HAS THE FINAL AUTHORITY ON THE EXTENT OF REGULATED WETLANDS, LAKES, AND STREAMS IN THE STATE OF ILLINOIS.

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTIONS: 36
TOWN, RANGE: T08N, R04W;
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

CLIENT
ATTICUS SOLAR
HILLSBORO TOWNSHIP,
MONTGOMERY COUNTY, IL
WETLAND LOCATION MAP

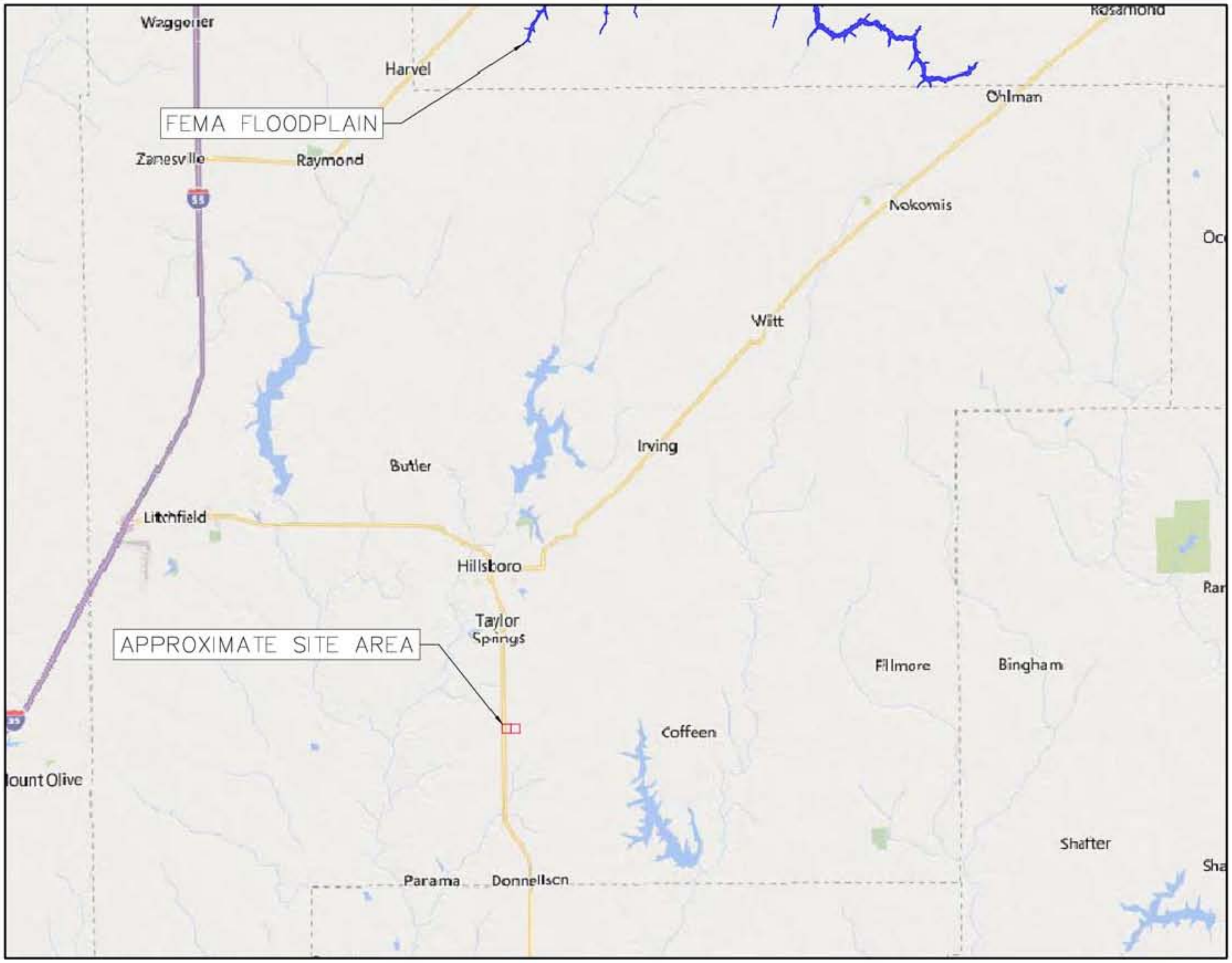
DATE 02/19/2025

REVISIONS

SCALE: 1"=150'
DR. NF CH. BS
P.M. BS
BOOK —
JOB 24009016
SHEET NO. 01

CAD FILE: 24009016-WLM.DWG

Attachment 5 – Location Map



LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

FEMA FLOODPLAIN

NOTE: NO FEMA FLOODPLAIN DATA AVAILABLE FOR MONTGOMERY COUNTY, ILLINOIS.

811 Know what's below. Call before you dig.

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SECTIONS: 36
TOWN, RANGE: T08N, R04W,
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, MICHIGAN

CLIENT
ATTICUS SOLAR
HILLSBORO TOWNSHIP, MONTGOMERY COUNTY, MI
FEMA FLOODPLAIN MAP

DATE 04/23/2025

REVISIONS

0 3750' 7500'
SCALE: 1"=7500'

DR. ZE	CH. BS
P.M. DB	
BOOK ---	
JOB 25001794	
SHEET NO. 01	

CAD FILE: 24009016-FEMA.DWG

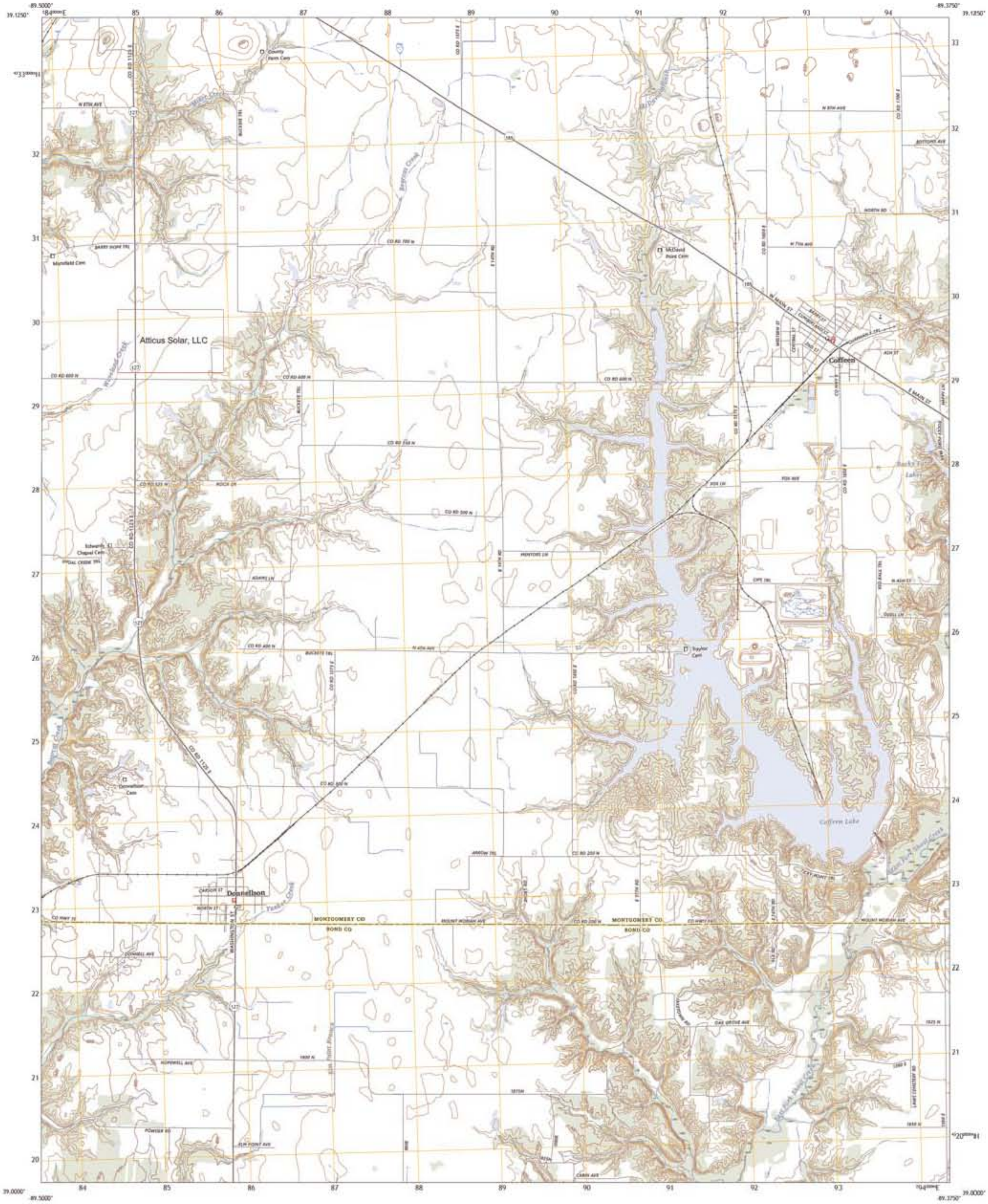
Attachment 6 – USGS Map

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
US Topo

COFFEEN QUADRANGLE
ILLINOIS
7.5-MINUTE SERIES



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 16S
This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands.

Imagery .... NAIP, July 2019 - July 2019
Roads .... U.S. Census Bureau, 2016 - 2017
Names .... GNIS, 2008 - 2021
Hydrography .... National Hydrography Dataset, 2006 - 2022
Contours .... National Elevation Dataset, 2022
Boundaries .... Multiple sources; see metadata file 2021 - 2022
Public Land Survey System .... BLM, 2020
Wetlands .... FWS National Wetlands Inventory Not Available

UTM GRID AND 2023 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard.

QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Butler
2 Hillsboro
3 Bald Knob
4 Sorento North
5 Fillmore
6 Sorento South
7 Greenville
8 Mulberry Grove

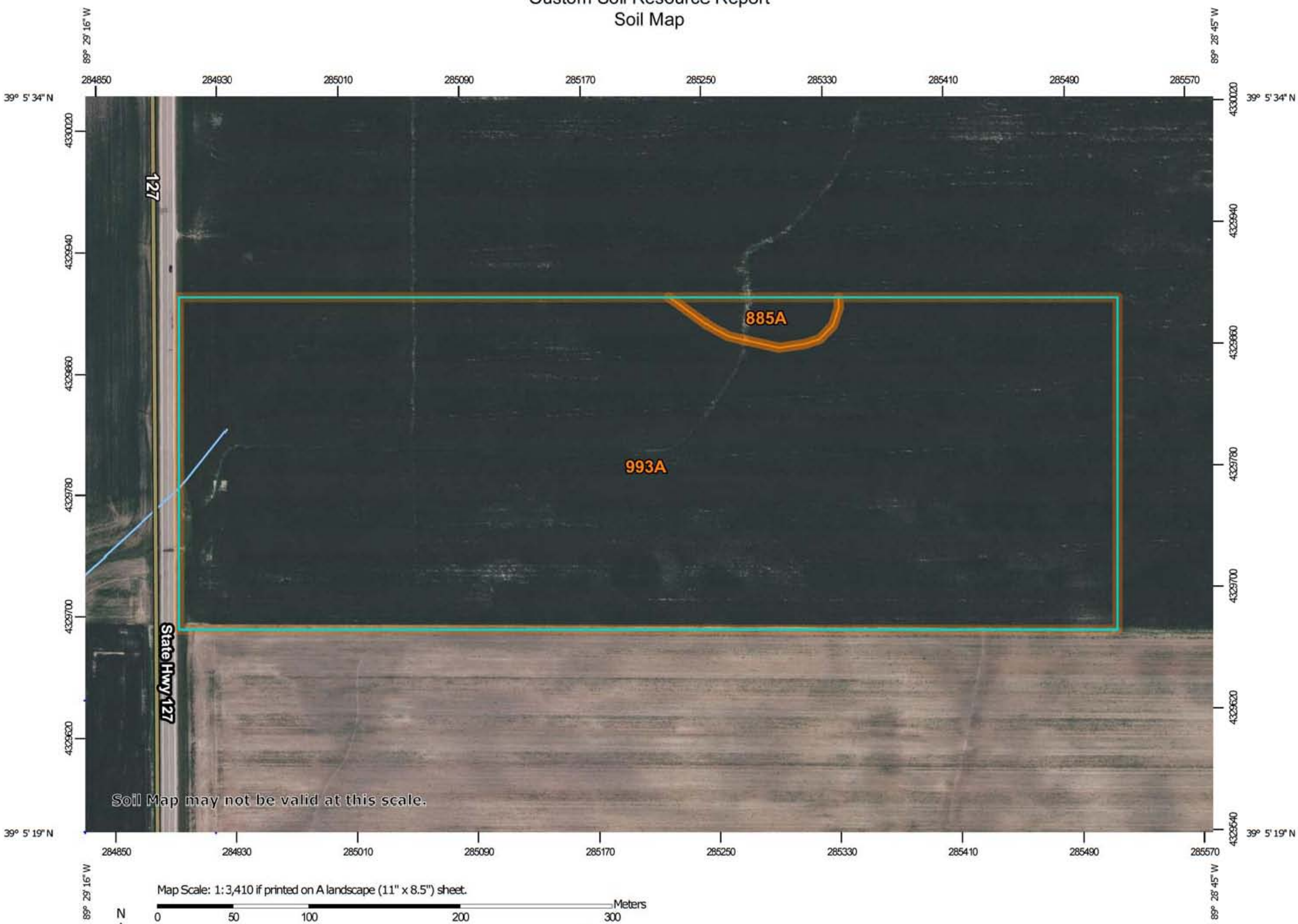
ADJOINING QUADRANGLES

ROAD CLASSIFICATION
Expressway
Secondary Hwy
Ramp
Local Connector
Local Road
4WD
Interstate Route
US Route
State Route

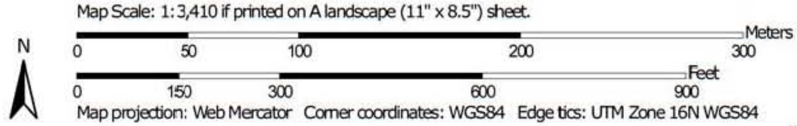
COFFEEN, IL
2024

Attachment 7 – NRCS Soil Report

Soil Map



Map Scale: 1:3,410 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Illinois
Survey Area Data: Version 21, Aug 21, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	0.6	1.9%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	33.1	98.1%
Totals for Area of Interest		**33.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Montgomery County, Illinois

885A—Virden-Fosterburg silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1vs0t
Elevation: 340 to 1,000 feet
Mean annual precipitation: 37 to 45 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 170 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Virden and similar soils: 50 percent
Fosterburg and similar soils: 40 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Virden

Setting

Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loess

Typical profile

H1 - 0 to 15 inches: silt loam
H2 - 15 to 74 inches: silty clay loam
H3 - 74 to 80 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R114XB902IN - Wet Upland Prairie
Hydric soil rating: Yes

Description of Fosterburg

Setting

Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loess

Typical profile

H1 - 0 to 13 inches: silt loam
H2 - 13 to 20 inches: silty clay loam
H3 - 20 to 41 inches: silty clay loam
H4 - 41 to 71 inches: silty clay loam
H5 - 71 to 80 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Sodium adsorption ratio, maximum: 13.0
Available water supply, 0 to 60 inches: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

Minor Components

Piasa

Percent of map unit: 3 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

993A—Cowden-Piasa silt loams, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tbs0
Elevation: 330 to 840 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Cowden and similar soils: 50 percent
Piasa and similar soils: 48 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cowden

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 8 inches: silt loam
Eg - 8 to 19 inches: silt loam
Btg - 19 to 50 inches: silty clay loam
Cg - 50 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 17 to 21 inches to abrupt textural change
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D
Ecological site: R113XY903IL - Wet Upland Prairie
Hydric soil rating: Yes

Description of Piasa

Setting

Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Interfluve, dip, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over silty pedisediment

Typical profile

Ap - 0 to 8 inches: silt loam
Eng - 8 to 12 inches: silt loam
Btng - 12 to 48 inches: silty clay loam
2BCng - 48 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 11 to 14 inches to natric
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.01 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

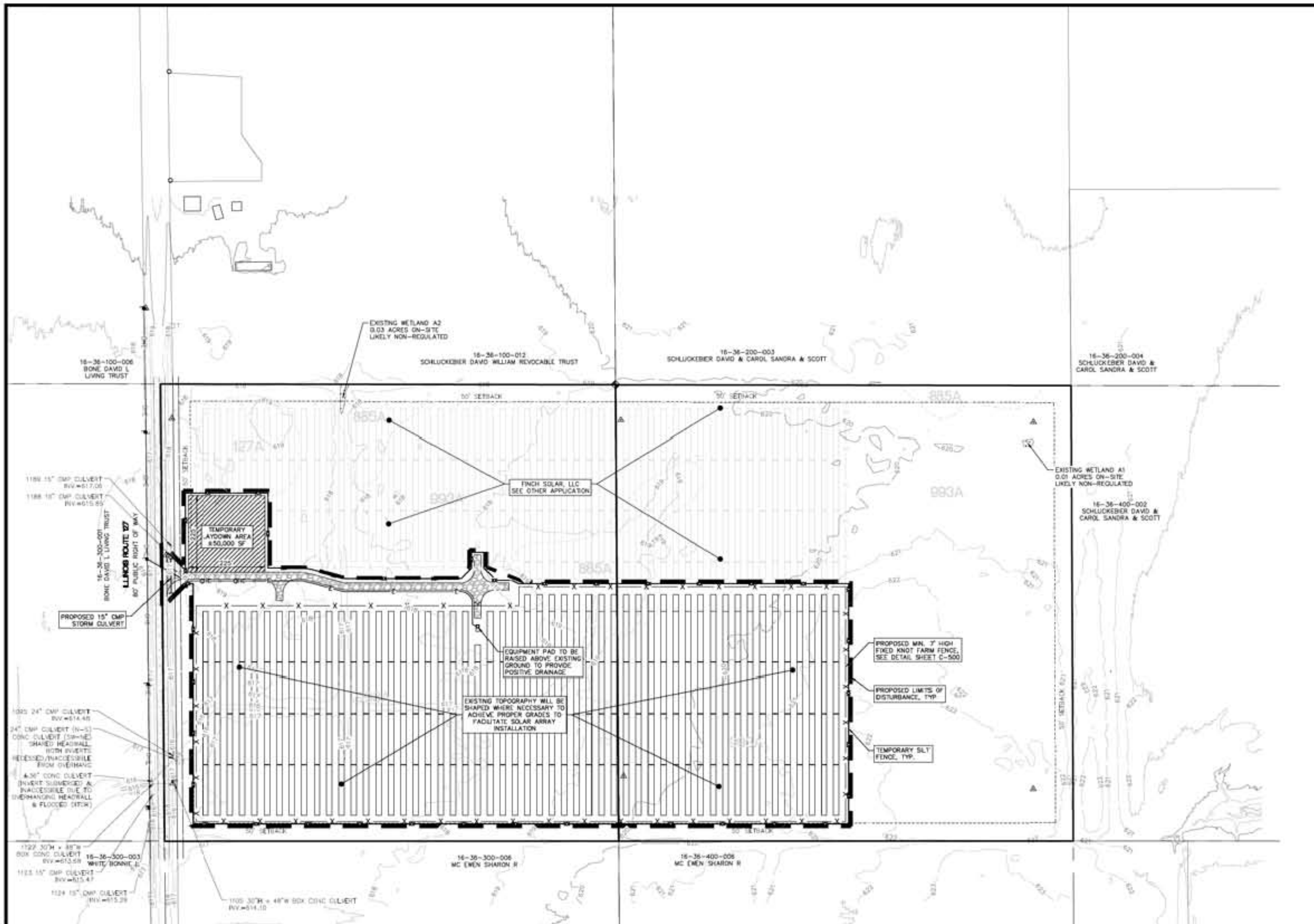
Minor Components

Darmstadt

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R113XY902IL - Natric Till Plain Savanna
Hydric soil rating: No

Attachment 8 – C-300 Grading Plan and Construction Details

NOT FOR CONSTRUCTION



LEGEND

- BOUNDARY LINE
- EXISTING ROW
- BOUNDARY ADJACENT LINE
- SECTION LINE
- EXISTING EASEMENT LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SETBACK LINE
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING UNDERGROUND TELEPHONE
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC LINE
- EXISTING UNDERGROUND ELECTRIC LINE
- PROPOSED UNDERGROUND ELECTRIC LINE
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- PROPOSED LIMITS OF DISTURBANCE
- EXISTING DRAIN TILE
- EXISTING ASPHALT
- EXISTING WETLAND
- PROPOSED GRAVEL ACCESS DRIVE
- TEMPORARY SILT FENCE
- APPROXIMATE LIMITS OF EXISTING SOIL TYPE

STORMWATER SUMMARY

PARCEL AREA:	± 80.6 ACRES
DISTURBED AREA:	± 33.7 ACRES
PROPOSED IMPERVIOUS AREA:	± 0.64 ACRES
AVERAGE EXISTING SOIL RATING:	D

	EXISTING CONDITIONS	PROPOSED CONDITIONS
COVER:	STRAIGHT ROW CROPS	PASTURE/MEADOW
CN FOR SITE:	89	85

- THE DRAINAGE AREA WILL NOT BE ALTERED BETWEEN THE EXISTING CONDITIONS AND THE PROPOSED CONDITIONS.
- THE DIFFERENCE BETWEEN THE TIME OF CONCENTRATION OF THE EXISTING CONDITIONS AND THE PROPOSED CONDITIONS WILL BE NEGLIGIBLE.
- DUE TO THE LARGE REDUCTION IN THE CURVE NUMBER BETWEEN THE EXISTING AND PROPOSED CONDITIONS, THE PROPOSED RUNOFF WILL BE REDUCED, THUS CAUSING NO NEGATIVE IMPACTS ON THE DOWNSTREAM TRIBUTARY AREAS.
- NO DETENTION WILL BE REQUIRED FOR THE PROPOSED DEVELOPMENT.

GRADING, DRAINAGE AND UTILITY NOTES:

1. UNDERGROUND UTILITIES WERE COMPILED FROM AVAILABLE RECORD PLANS OF UTILITY COMPANIES AND PUBLIC AGENCIES, ARE APPROXIMATE AND ASSUMED. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "811" OR EQUIVALENT AND THE OWNER TO ACCURATELY LOCATE UNDERGROUND UTILITIES. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL BE DONE UNTIL UTILITY COMPANIES AND THE OWNER ARE PROPERLY NOTIFIED IN ADVANCE.
2. ALL SITE WORK SHALL MEET OR EXCEED THE SITE WORK SPECIFICATIONS TO BE PREPARED FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED.
3. ALL WORK PERFORMED AND ALL MATERIALS FURNISHED SHALL CONFORM WITH THE LINES, GRADES AND OTHER SPECIFIC REQUIREMENTS OR SPECIFICATIONS FOR THE PROJECT AS SHOWN ON THE PLANS.
4. THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER AND ENGINEER FOR RESOLUTION.
5. CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION.
6. THE CONTRACTOR SHALL REMOVE ALL NON-BIODEGRADABLE EROSION CONTROL BARRIERS AFTER RE-VEGETATION OF DISTURBED AREAS.
7. WETLANDS ARE TO REMAIN UNDISTURBED. NO ENCROACHMENT PERMITTED UNLESS NOTED ON PLANS.
8. PITCH EVENLY BETWEEN SPOT GRADES.
9. THE CONTRACTOR SHALL SCHEDULE HIS WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PONDING. SPECIFICALLY, ALLOW WATER TO ESCAPE WHERE PROPOSED CURB MAY RETAIN RUNOFF PRIOR TO APPLICATION OF THE FINISH SUBGRADE AND/OR SURFACE PAVING. PROVIDE TEMPORARY POSITIVE DRAINAGE AS REQUIRED.
10. EXISTING SITE SURFACE DRAINAGE PATTERNS WILL BE MAINTAINED.

SOIL LEGEND

SOIL TYPE	SOIL GROUP	SOIL NAME
127A	C	HARRISON SILT LOAM, 0 TO 2 PERCENT SLOPES
885A	C/D	VIRDEN-FOSTERBURG SILT LOAMS, 0 TO 2 PERCENT SLOPES
993A	D	COWDEN-PIASA SILT LOAMS, 0 TO 2 PERCENT SLOPES

EXISTING CURVE NUMBER

SOIL RATING	COVER DESCRIPTION	CN (TR-55 TABLE 2-2)	AREA
C	ROW CROPS; STRAIGHT ROW (SR) GOOD	85	1.65
C/D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	4.56
D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	73.97
–	IMPERVIOUS AREAS	98	0.44
		COMBINED CN= 89	80.63

PROPOSED CURVE NUMBER

SOIL RATING	COVER DESCRIPTION	CN (TR-55 TABLE 2-2)	AREA
C	ROW CROPS; STRAIGHT ROW (SR) GOOD	85	1.59
C	PASTURE; GOOD	74	0.06
C/D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	3.59
C/D	PASTURE; GOOD	80	0.97
D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	41.37
D	PASTURE; GOOD	80	31.96
–	EXISTING IMPERVIOUS AREA	98	0.44
–	PROPOSED IMPERVIOUS AREA	98	0.64
		COMBINED CN= 85	80.63

EROSION CONTROL AND SEDIMENTATION NOTES:

1. AN EROSION CONTROL BARRIER SHALL BE INSTALLED AS INDICATED IN THE PLAN PRIOR TO THE COMMENCEMENT OF DEMOLITION OR CONSTRUCTION OPERATIONS.
2. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES DURING ENTIRE CONSTRUCTION PERIOD.
3. ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
4. ALL STOCKPILE AREAS SHALL BE LOCATED WITHIN LIMIT OF WORK LINE AND STABILIZED TO PREVENT EROSION.
5. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
6. SITE ELEMENTS TO REMAIN MUST BE PROTECTED FOR DURATION OF PROJECT.
7. ALL TOPSOIL ENCOUNTERED WITHIN THE LIMITS OF THE PROPOSED PERMANENT AND TEMPORARY GRAVEL ROADS, EQUIPMENT PAD AREA, AND AREAS OF CUT AND FILL SHALL BE STRIPPED AS NEEDED AND STOCKPILED FOR REUSE. EXCESS TOPSOIL SHALL BE DISPOSED OF ON SITE AS DIRECTED BY OWNER. TOPSOIL PILES SHALL REMAIN SEGREGATED FROM EXCAVATED SUBSURFACE SOIL MATERIALS.
8. ADDITIONAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.
9. ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADS.
10. TEMPORARY DIVERSION DITCHES, PERMANENT DITCHES, CHANNELS, EMBANKMENTS, AND ANY DENUDED SURFACE WHICH WILL BE EXPOSED FOR AN EXTENDED PERIOD OF TIME SHALL BE STABILIZED AS REQUIRED.
11. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION TO ENSURE THAT CHANNELS, DITCHES, AND PIPES ARE CLEAR OF DEBRIS AND THAT THE EROSION CONTROL BARRIERS ARE INTACT.
12. DUST SHALL BE CONTROLLED AS NEEDED BY SPRINKLING OR OTHER APPROVED METHODS AS NECESSARY, OR AS DIRECTED BY THE OWNER OR REPRESENTATIVE.
13. CARE SHALL BE EXERCISED SO AS TO PREVENT ANY UNSUITABLE MATERIAL FROM MIGRATING OUTSIDE THE LIMIT OF WORK.
14. ADDITIONAL EROSION CONTROL SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR REPRESENTATIVE.
15. CLEAN AND MAINTAIN EROSION CONTROL BARRIER AS REQUIRED DURING CONSTRUCTION OPERATIONS TO ENSURE ITS CONTINUED FUNCTIONALITY.
16. OVERALL SITE DEVELOPMENT WILL MAINTAIN EXISTING TOPOGRAPHY AND STORM WATER DRAINAGE PATTERNS.
17. THE OVERALL DEVELOPMENT WILL BE RE-SEEDED AS NEEDED TO DEVELOP A PERMANENT VEGETATIVE COVER AS INDICATED ON THE LANDSCAPE PLAN. COVER CROP OR OTHER TEMPORARY STABILIZATION WILL BE IMPLEMENTED IN THE INTERIM.
18. NO CONSTRUCTION ACTIVITIES AS PART OF THE SITE DEVELOPMENT SHALL OCCUR WITHIN ANY DELINEATED WETLANDS OR WETLAND BUFFERS, AS REQUIRED BY THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES.
19. TOPOGRAPHIC INFORMATION IS BASED ON COUNTY AVAILABLE GIS INFORMATION.
20. ALL DRAIN TILES SHALL BE FIELD ADJUSTED TO AVOID THE SOLAR PANEL PILES. ANY DAMAGE TO THE DRAIN TILES SHALL BE REPAIRED. THE CONTRACTOR SHALL ENSURE ALL DRAIN TILES ARE CARRYING WATER AS INTENDED, ENSURING THAT NO UPSTREAM FLOODING WILL OCCUR DUE TO THE CONSTRUCTION OF THIS SITE.

811 Know what's below. Call before you dig.

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ATTRIBUTE: IRONWOOD RENEWABLES, LLC
ATTICUS SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
GRADING PLAN

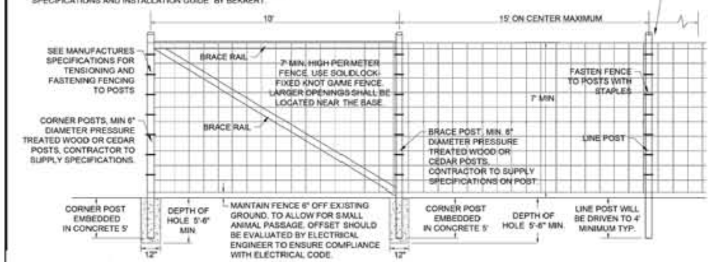
SECTION 36
TOWN 8 NORTH, RANGE 4 WEST
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

DATE: MAY 12, 2025
SCALE: 1" = 150 FEET
DR. C.M.P. CH. M.S.
P.M. M. KEITH
JOB 24000016
SHEET NO. C-300

NOT FOR CONSTRUCTION

FENCE MATERIAL:
SOLIDLOCK FIXED KNOT GAME FENCE SPECIFICATION
- FENCE FABRIC SHALL BE BEKAERT ZA-8' FIXED KNOT GAME FENCE
- 96" HIGH
- 12.5 GAUGE WIRE
- CLASS 3 GALVANIZED

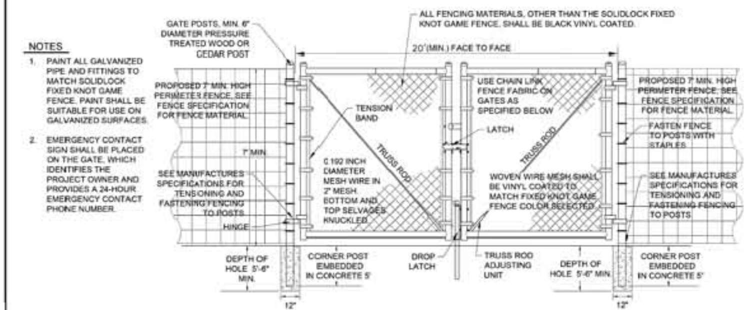
INSTALL ALL FENCE COMPONENTS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. SEE "FIXED KNOT BRACE SPECIFICATIONS AND INSTALLATION GUIDE" BY BEKAERT



TYPICAL FIXED KNOT GAME FENCE
NOT TO SCALE

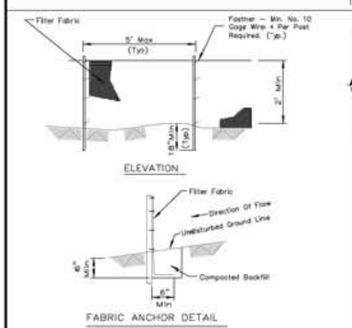
NOTES
1. ADDITIONAL BRACING MAY BE REQUIRED ON LONGER FENCE RUNS. CONTRACTOR TO ADD ADDITIONAL BRACING WHEN CONTRACTOR OBSERVES CORNER POST DEFLECTION DURING FENCE TENSIONING/FASTENING.
2. FABRIC TO BE FASTENED TO POSTS WITH STAPLES APPROVED BY THE ENGINEER.

NOTES
1. PAINT ALL GALVANIZED PIPE AND FITTINGS TO MATCH SOLIDLOCK FIXED KNOT GAME FENCE. PAINT SHALL BE SUITABLE FOR USE ON GALVANIZED SURFACES.
2. EMERGENCY CONTACT SIGN SHALL BE PLACED ON THE GATE, WHICH IDENTIFIES THE PROJECT OWNER AND PROVIDES A 24-HOUR EMERGENCY CONTACT PHONE NUMBER.



DOUBLE SWING GATE
NOT TO SCALE

SILT FENCE PLAN

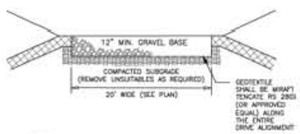


FABRIC ANCHOR DETAIL

NOTES:
1. Temporary sediment fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilizations.
2. Filter fabric shall meet the requirements of materials specification 592 Geotextile Table 1 or 2, Class I with equivalent opening size of lease 30! for nonwoven and 40 for woven.
3. Fence posts shall be either standard steel posts or wood post with minim cross sectional area of 3.0 sq. in.

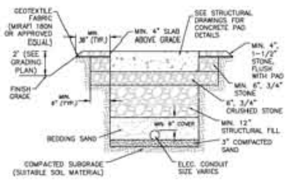
REFERENCE		STANDARD DWG. NO.
Project ______		IUM-620A
Designed ______ Date ______		SHEET 1 OF 2
Checked ______ Date ______		DATE 5-16-2012
Approved ______ Date ______		

MAINTENANCE:
SILT FENCE SHALL BE REMOVED ONCE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.
SILT FENCE SHALL BE INSPECTED NO LESS FREQUENTLY THAN EVERY WEEK DURING CONSTRUCTION. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE FENCE STILL IS NECESSARY, THE FABRIC OR THE ENTIRE SYSTEM SHALL BE REPLACED PROMPTLY.
SEDIMENT DEPOSITS MUST BE REMOVED WHEN THE LEVEL OF DEPOSITION REACHES APPROXIMATELY ONE-HALF THE HEIGHT OF THE SILT FENCE.
ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, A SEEDBED PREPARED AND THE SITE VEGETATED.

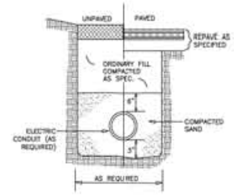


NOTES:
1. REMOVE TOPSOIL AND ALL UNSUITABLE MATERIAL AS REQUIRED AND REPLACE WITH GRAVEL.
2. ACCESS DRIVES TO SLOPE IN THE DIRECTION OF THE EXISTING GRADE AT A MINIMUM OF 2.0% DRIVEWAY SHALL BE GRADED TO ALLOW STORMWATER TO SHEET ACROSS IT AND TO PREVENT PUDDLING.

ACCESS DRIVE CROSS SECTION
NOT TO SCALE



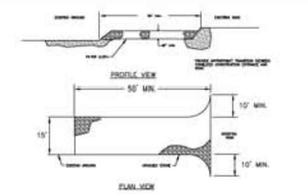
EQUIPMENT FOUNDATION DETAIL
NOT TO SCALE



ELECTRIC CONDUIT TRENCH
NOT TO SCALE

TYPICAL "DANGER" WARNING SIGN
NOT TO SCALE

TYPICAL EMERGENCY CONTACT SIGN
NOT TO SCALE



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 8 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE PROPOSED ENTRANCE.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARDS THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE SURFACE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO EXISTING ROAD. THIS MANY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO EXISTING ROAD SHALL BE REMOVED IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

811
Know what's below. Call before you dig.

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ATTRIBUTE: IRONWOOD RENEWABLES, LLC
ATTICUS SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
DETAILS

SECTION 36
TOWN 8 NORTH, RANGE 4 WEST
HILLSBORO TOWNSHIP
MONTGOMERY COUNTY, ILLINOIS

DATE: MAY 12, 2025
REVISIONS
SCALE: N.T.S.
DR. C.M.P. | CH. M.S.
P.M. M. KEITH
JOB 24009016
SHEET NO. C-500

Attachment 9 – BMP Installation Log

BMP INSTALLATION LOG

Project: Atticus Solar, LLC

Location: State Route 127 Hillsboro, Montgomery County, IL 62049

BMP Name	Date Installed	Description of BMP Installed	Responsible Party

Attachment 10 – Amendment Log

AMENDMENT LOG

Project: Atticus Solar, LLC

Location: State Route 127 Hillsboro, Montgomery County, IL 62049

Amendment No.	Date	Description of Amendment