Finch Solar, LLC
5 MW Community Solar Facility

Prepared by: Finch 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

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1.0 Introduction

Finch 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 26.6 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.

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 is currently pending supplemental review with Ameren. Pending approval of this Application and issuance of the necessary building permits, construction is projected to begin in May 2027. 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.

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 Finch Solar project is a proposed 5.00 MWac distributed energy resource facility located in Montgomery County, Illinois. The project has submitted an interconnection application to Ameren Illinois under Queue Position DER-54499. Supplemental review is expected to begin in February 2026. The project is planned to interconnect to Ameren's 34.5kV system near County Road 1125 E and State Route 127.

Power generated from the site will be delivered through Ameren's 34.5kV infrastructure, with anticipated interconnection facilities including a 3-wire meter, instrument transformers, meter cabinet, SCADA communication, and an Intellirupter with mapped communication to an existing Intellinode. Final feeder and downstream network segments will be confirmed during detailed engineering and final scoping.

All interconnection facilities will be designed and constructed in accordance with Ameren's published standards and final engineering requirements. A copy of the interconnection application is provided in Exhibit B.

2.3 Project Construction

Construction activities for the Finch 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	24–48

		trucks, and material deliveries	
Months 2–5	Fence installation, racking, module placement, and final access road work	30–44 total vehicles/day including material/equipment deliveries and personnel	80–120
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 Finch 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 May 6, 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 April 30, 2025, the Applicant submitted a formal EcoCAT request for the Finch 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 Finch 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 May 6, 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 assessment 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 Ameren's standards and final engineering requirements. The interconnection application and supporting feasibility study materials are included in Exhibit B. A fully executed Interconnection Agreement will be obtained prior to construction.

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 Finch 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. Finch 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 Finch Solar LLC is sold by Ironwood Projects.

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RENEWABLES

Exhibit A: Solar Farm Permit Application

APPLICANT & PROPERTY OWNER INFORMATION (Print or Type):

Applicant/Petitioner information: Finch 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 26, 2025 07:03 CDT) Date: 04/26/2025

Property Owner's Printed/Typed Name: Daniel Chappelear

Signature: Daniel Chappelear (Apr 25, 2025 17:03 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 26, 2025 07:03 CDT) Date: 04/26/2025

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-FinchCountyApplication

Final Audit Report 2025-04-26

Created:	2025-04-25
By:	Keith Morel (kmorel@ironwoodenergy.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAn5CBu_PZ9KfkOq6kjLel7TsW6d5L0INm

"2025.04.25-FinchCountyApplication" History

Document created by Keith Morel (kmorel@ironwoodenergy.com)
2025-04-25 - 8:23:29 PM GMT

Document emailed to Daniel Chappelear (chap_81@hotmail.com) for signature
2025-04-25 - 8:23:33 PM GMT

Email viewed by Daniel Chappelear (chap_81@hotmail.com)
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Document e-signed by Daniel Chappelear (chap_81@hotmail.com)
Signature Date: 2025-04-25 - 10:03:37 PM GMT - Time Source: server

Document emailed to Adrian Ortlieb (adrian.ortlieb@ironwoodenergy.com) for signature
2025-04-25 - 10:03:39 PM GMT

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Document e-signed by Adrian Ortlieb (adrian.ortlieb@ironwoodenergy.com)
Signature Date: 2025-04-26 - 12:03:26 PM GMT - Time Source: server

Agreement completed.
2025-04-26 - 12:03:26 PM GMT

IRONWOOD RENEWABLES

Exhibit B: Interconnection Application

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Level 2, Level 3 & Level 4
Interconnection Request Application Form
(Greater than 25 kW to 10 MVA or less)

Interconnection Customer Contact Information

Name: Hamilton Carrier

Mailing Address: 910 Harding St,

City: Lafayette State: LA Zip Code: 70503

Telephone (Daytime): (337) 889-3940 (Evening): (337) 889-3940

Facsimile Number: E-Mail Address: hcarrier@ironwoodenergy.com

Alternative Contact Information (if different from Customer Contact Information)

Name: Keith Morel

Mailing Address: 910 Harding St,

City: Lafayette State: LA Zip Code: 70503

Telephone (Daytime): 3378893940 (Evening): 3378893940

Facsimile Number: E-Mail Address: kmorel@ironwoodenergy.com

Facility Address (if different from above): County Road 1125 E,

City: Montgomery State: IL Zip Code: 62049

Electric Distribution Company (EDC) Serving Facility Site: Ameren Illinois

Electric Supplier (if different from EDC):

Account Number of Facility Site (existing EDC customers):

Inverter Manufacturer: SMA America Model: Sunny Highpower PEAK3 125-US

Equipment Contractor

Name: Adrian Ortlieb

Mailing Address: 910 Harding St,

City: Lafayette State: LA Zip Code: 70503

Telephone (Daytime): 3378893940 (Evening): 3378893940

Facsimile Number: E-Mail Address: adrian.ortlieb@ironwoodenergy.com

Electrical Contractor (if different from Equipment Contractor)

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Name: Piyusha Shinde

Mailing Address: 4735 Walnut St Suite 110, Boulder, CO 80301,

City: Boulder State: CO Zip Code: 80301

Telephone (Daytime): (346) 855-4433 (Evening): (346) 855-4433

Facsimile Number: E-Mail Address: interconnections@hyderenewables.com

License Number: 0

Electric Service Information for Customer Facility Where Generator Will Be Interconnected

Capacity: 84 (Amps) Voltage: 34500 (Volts)

Type of Service:

If 3 Phase Transformer, Indicate Type:

Primary Winding:

Secondary Winding:

Transformer Size: Impedance:

Line or Load Connected: Line Side

Intent of Generation

Net Meter (Unit will operate in parallel and will export power pursuant to Illinois Net Metering or other filed tariffs)

Note: Backup units that do not operate in parallel for more than 100 milliseconds do not need an interconnection agreement.

Generator& Prime Mover Information

ENERGY SOURCE (Hydro, Wind, Solar, Process Byproduct, Biomass, Oil, Natural Gas, Coal, Storage, etc.): Solar		
ENERGY CONVERTER TYPE (Wind Turbine, Photovoltaic Cell, Fuel Cell, Steam Turbine, etc.): Photovoltaic		
NAMEPLATE CAPACITY: 125 kW	NUMBER OF UNITS: 40	TOTAL EXPORT CAPACITY: 5,000 kW
GENERATOR TYPE (Check one): Inverter		

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Requested Procedure Under Which to Evaluate Interconnection Request[1]

Please indicate below which review procedure applies to the interconnection request. The review procedure used is subject to confirmation by the EDC.

Level 2 – Lab-certified interconnection equipment with an aggregate electric nameplate capacity not exceeding the specifications in Section 466.90(b)(2). Lab-certified is defined in Section 466.30. (Application fee is $100 plus $1.00 per kVA.)

Level 3 – Distributed energy resource facility does not export power. Nameplate capacity rating is less than or equal to 50 kW if connecting to area network or less than or equal to 10 MW if connecting to a radial distribution feeder. (Application fee amount is $500 plus $2.00 per kVA.)

Level 4 – Nameplate capacity rating is less than or equal to 10 MVA and the distributed energy resource facility does not qualify for a Level 1, Level 2 or Level 3 review, or the distributed energy resource facility has been reviewed but not approved under a Level 1, Level 2 or Level 3 review. (Application fee amount is $1,000 plus $2.00 per kVA, to be applied toward any subsequent studies related to this application.)

[1] **Note:** Descriptions for interconnection review categories do not list all criteria that must be satisfied. For a complete list of criteria, please refer to 83 Ill. Adm. Code 466, Electric Interconnection of Distributed Generation Facilities.

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Distributed Generation Facility Information

Commissioning Date: 11/15/2027
List interconnection components/systems to be used in the distributed generation facility that are lab-certified.

	Component/System	NRTL Providing Label & Listing
1.		
2.		
3.		
4.		
5.		

Please provide copies of manufacturer brochures or technical specifications.

Energy Production Equipment/Inverter Information:

Inverter

Rating: 125 kW Rating: _____ kVA
Rated Voltage: 480 Volts Rated Current: 151 Amps

System Type Tested: Yes

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

For Synchronous Machines:

Note: Contact EDC to determine if all the information requested in this section is required for the proposed distributed generation facility.

Manufacturer: _____

Model No.: _____ Version No.: _____

Submit copies of the Saturation Curve and the Vee Curve

Rotor Type: _____

Torque: _____ lb/ft Rated RPM: _____ Field Amperes: _____ at rated generator voltage and current and _____ % PF over-excited

Type of Exciter: _____

Output Power of Exciter: _____

Type of Voltage Regulator: _____

Locked Rotor Current: _____ Amps Synchronous Speed: _____ RPM

Winding Connection: _____ Min. Operating Freq./Time: _____

Generator Connection:

Direct-axis Synchronous Reactance: (Xd) _____ ohms

Direct-axis Transient Reactance: (X'd) _____ ohms

Direct-axis Sub-transient Reactance: (X'd) _____ ohms

Negative Sequence Reactance: _____ ohms

Zero Sequence Reactance: _____ ohms

Neutral Impedance or Grounding Resister (if any): _____ ohms

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

For Induction Machines:

Note: Contact EDC to determine if all the information requested in this section is required for the proposed distributed generation facility.

Manufacturer: _____

Model No.: _____ Version No.: _____

Locked Rotor Current: _____ Amps

Rotor Resistance (Rr): _____ ohms Exciting Current: _____ Amps

Rotor Reactance (Xr): _____ ohms Reactive Power Required: _____

Magnetizing Reactance (Xm): _____ ohms _____ VARs (No Load)

Stator Resistance (Rs): _____ ohms _____ VARs (Full Load)

Stator Reactance (Xs): _____ ohms

Short Circuit Reactance (X"d): _____ ohms

Phases:

Frame Size: _____ Design Letter: _____ Temp. Rise: _____ °C.

Limited Export and Non-Export Controls Information

Manufacturer: _____

Model Number: _____ M

Limited Export or Non-Export? Limited Export Non-Export

Control Type:

_____ Reverse Power Protection

_____ Relative Distributed Energy Resource Rating

_____ Limited Export Power Control Systems

_____ Directional Power Protection

_____ Minimum Power Protection

_____ Configured Power Rating

_____ Limited Export using mutually agreed-upon means

Export Capacity Value (in kW): _____

Control Power Setting: _____

Control Power Time Delay (if any): _____

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Additional Information For Inverter-Based Facilities

Inverter Information:

Manufacturer: SMA America Model: Sunny Highpower PEAK3 125-US

Type: Forced Commutated

Rated Output: 125 kW 480 Volts

Efficiency: 98.5 % Power Factor: 100 %

Inverter UL 1741 Listed: **Yes**

DC Source / Prime Mover:

Rating: 8121.6 kW Rating: 8121.6 kVA

Rated Voltage: 45.53 Volts

Open Circuit Voltage (if applicable): 53.61 Volts

Rated Current: 13.29 Amps

Short Circuit Current (if applicable): 14.08 Amps

Other Facility Information:

One Line Diagram attached: Yes

Plot Plan attached: Yes

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Battery Storage Facility Information (If Applicable)

Do the batteries share an inverter with a renewable energy system? ☐ Yes ☐ No

Does the applicant intend to have the batteries charged by the distribution grid? ☐ Yes ☐ No

System Manufacturer: _____

Model: _____

Battery Type: _____

Battery Charge/Discharge Rating (kW AC): _____

Maximum Battery Charge/Discharge Rate (kW AC per second): _____

Battery Energy Capacity (kWh): _____

Power Factor Settings Range: _____

Battery Storage Inverter Information

Energy System Manufacturer: _____ Model: _____ Type: ☐ Forced ☐ Commutated

Line Commutated Rated Output Watts: _____ Volts: _____ Efficiency: ____% Power Factor: ____%

Inverter IEEE 1547 / UL 1741 Listed: ☐ Yes ☐ No

Number of Inverters: _____ Total Capacity: _____ kW

DC Source / Prime Mover: _____ - Rating: _____ kW Rating: _____

kVA Rated Voltage: _____ Volts

Open Circuit Voltage (If Applicable): _____ Volts

Rated Current: _____ Amps

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Battery Operational Information

Backup – allows for partial or whole home transition to off-grid during a grid outage. ☐ Yes ☐ No

Solar Self-Powered – the battery will charge from the renewable energy source during normal operation and discharge to serve loads behind your meter. ☐ Yes ☐ No

Solar Non-Export – limits the export of energy to the grid to zero for both the battery and inverter, even if the battery system is fully charged and there is excess renewable source energy. ☐ Yes ☐ No

Time-Based Control (sometimes called time-of-use or TOU mode) – the battery charges during off-peak hours and discharges to serve onsite loads during on-peak hours. ☐ Yes ☐ No

Customer Signature

I hereby certify that all of the information provided in this Interconnection Request Application Form is true.

Applicant Signature: DocuSigned by: 46F140BE48D149E...

Title: _____ Date: 11/18/2024

An application fee is required before the application can be processed. Please verify that the appropriate fee is included with the application:

Amount: _____

EDC Acknowledgement

Receipt of the application fee is acknowledged and this interconnection request is complete.

EDC Signature: _____ Date: _____

Printed Name: _____ Title: _____

(Source: Amended at 46 Ill. Reg. 9666, effective May 26, 2022)

Docusign Envelope ID: B53D4A65-B035-46BE-BA98-D3181AFAF2D1

Ameren Illinois

Application for Net Metering Services

(Please fill out separate applications for each proposed net metering location.)

Customer Name Hamilton Carrier

Mailing Address 910 Harding St

City Lafayette State LA Zip Code 70503

Daytime Phone Number (337) 889-3940

Address of proposed net metering location (if different from above)

County Road 1125 E,

City Montgomery, IL Zip Code 62049

Ameren Account Number:

Name Plate Capacity Rating of Existing/Proposed Generator: 5,000 kW AC

Has generator already been installed? No

Please place a check mark next to the fuel source of the existing/proposed generator:

_____ Solar

_____ Wind

_____ Agricultural Residues

_____ Livestock Manure

_____ Landscape Trimmings

_____ Hydroelectric

_____ Untreated and Unadulterated Wood Wastes

_____ Other (please specify)

_____ Dedicated Crops Grown for Electricity Production (please specify crop) _____

_____ Anaerobic Digestion of Livestock or Food Processing Waste

_____ Fuel Cell or Microturbine Powered by Renewable Fuels

Solar

For customers served under Delivery Service rate DS-1 or DS-2, please select your Annual Period Anniversary Month: **October**

DocuSigned by:
46F140BE48D149E...

11/18/2024

Customer Signature Date

Please mail the completed application to: Ameren Illinois Net Metering Coordinator

10 Executive Dr – Mail Code 910

Collinsville, IL 62234

For questions regarding application contact Net Metering Coordinator at: renewablesillinois@ameren.com

IRONWOOD
RENEWABLES

Exhibit C: Solar Farm Development Permit Plans

IRONWOOD RENEWABLES

APPLICANT: IRONWOOD RENEWABLES, LLC
PROJECT NAME: FINCH 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

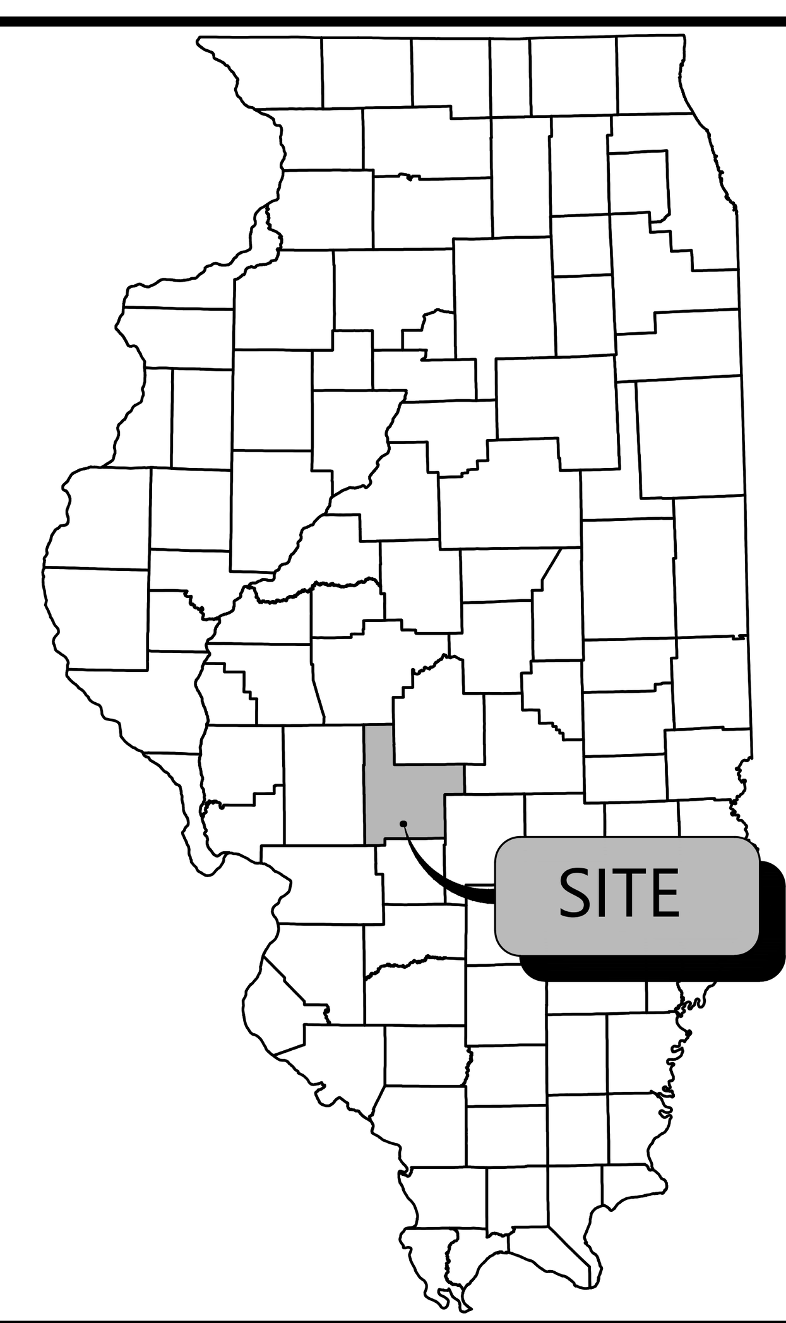
THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER (NW1/4SE1/4) OF SECTION THIRTY-SIX (36), TOWNSHIP EIGHT (8) NORTH, RANGE FOUR (4) WEST OF THE THIRD PRINCIPAL MERIDIAN, MONTGOMERY COUNTY, ILLINOIS.

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

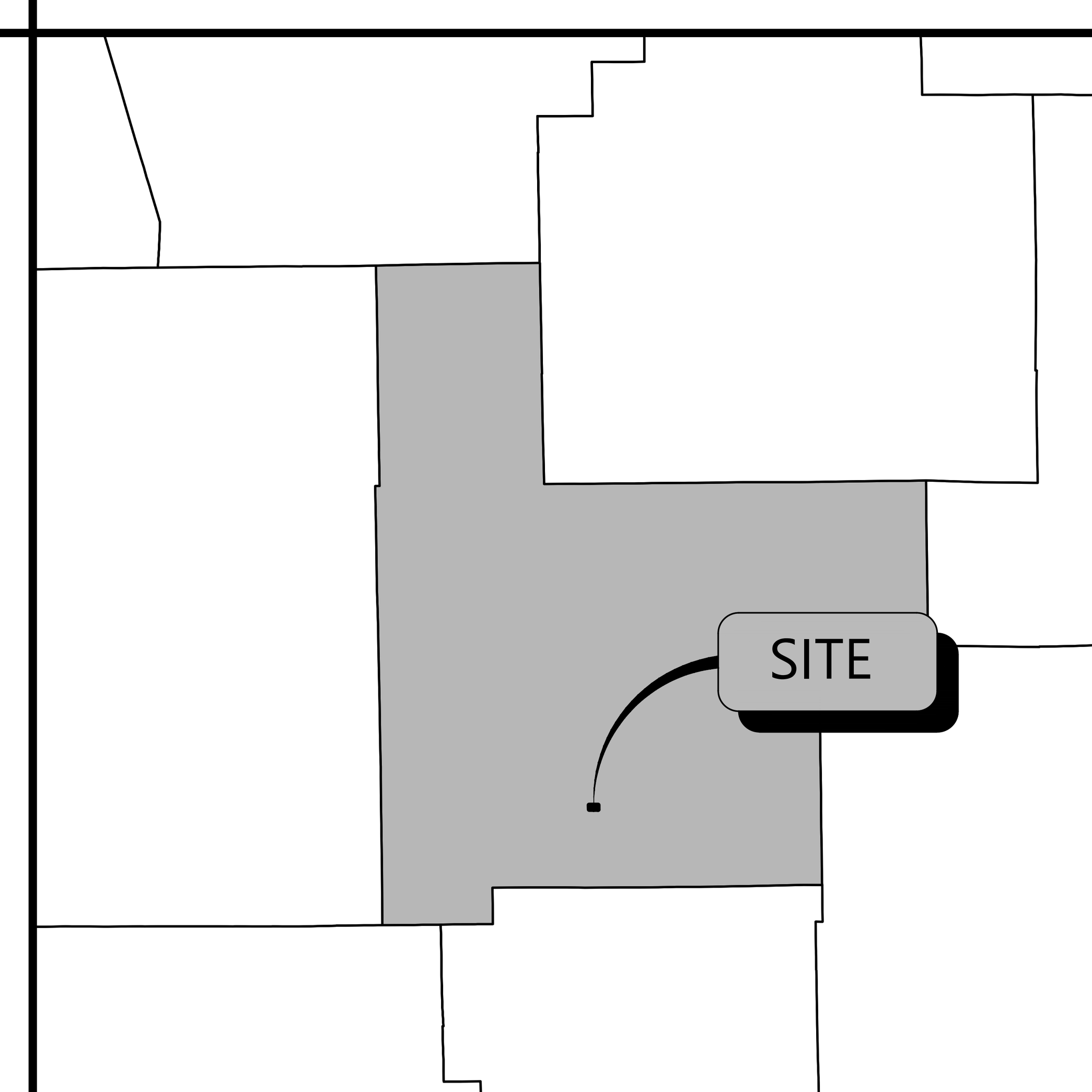
MICHAEL B. KEITH, P.E.
LICENSE NO. 062-066723
EXP. 11/30/2025

062-066723 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

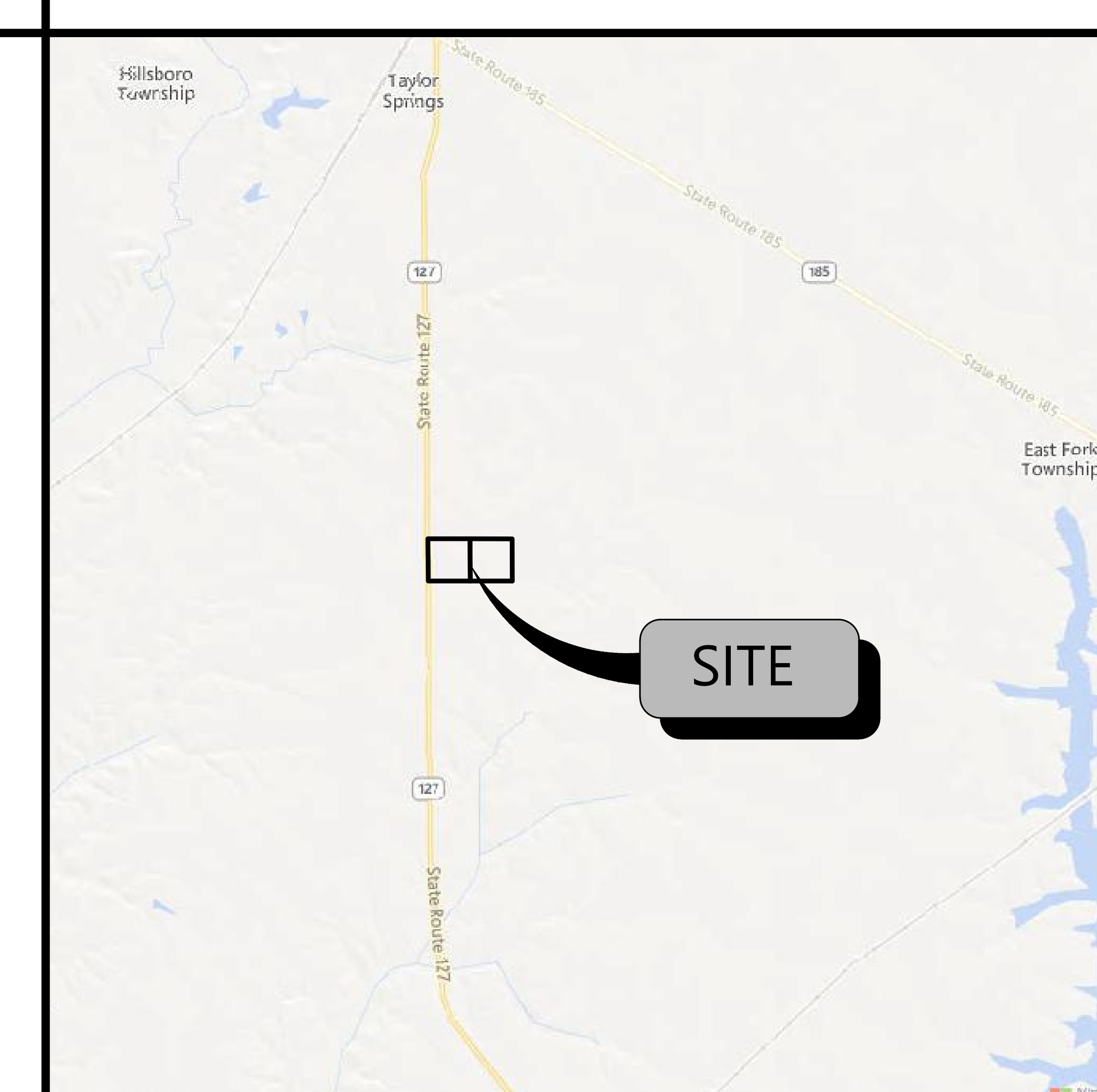
05/12/2025
DATE



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.

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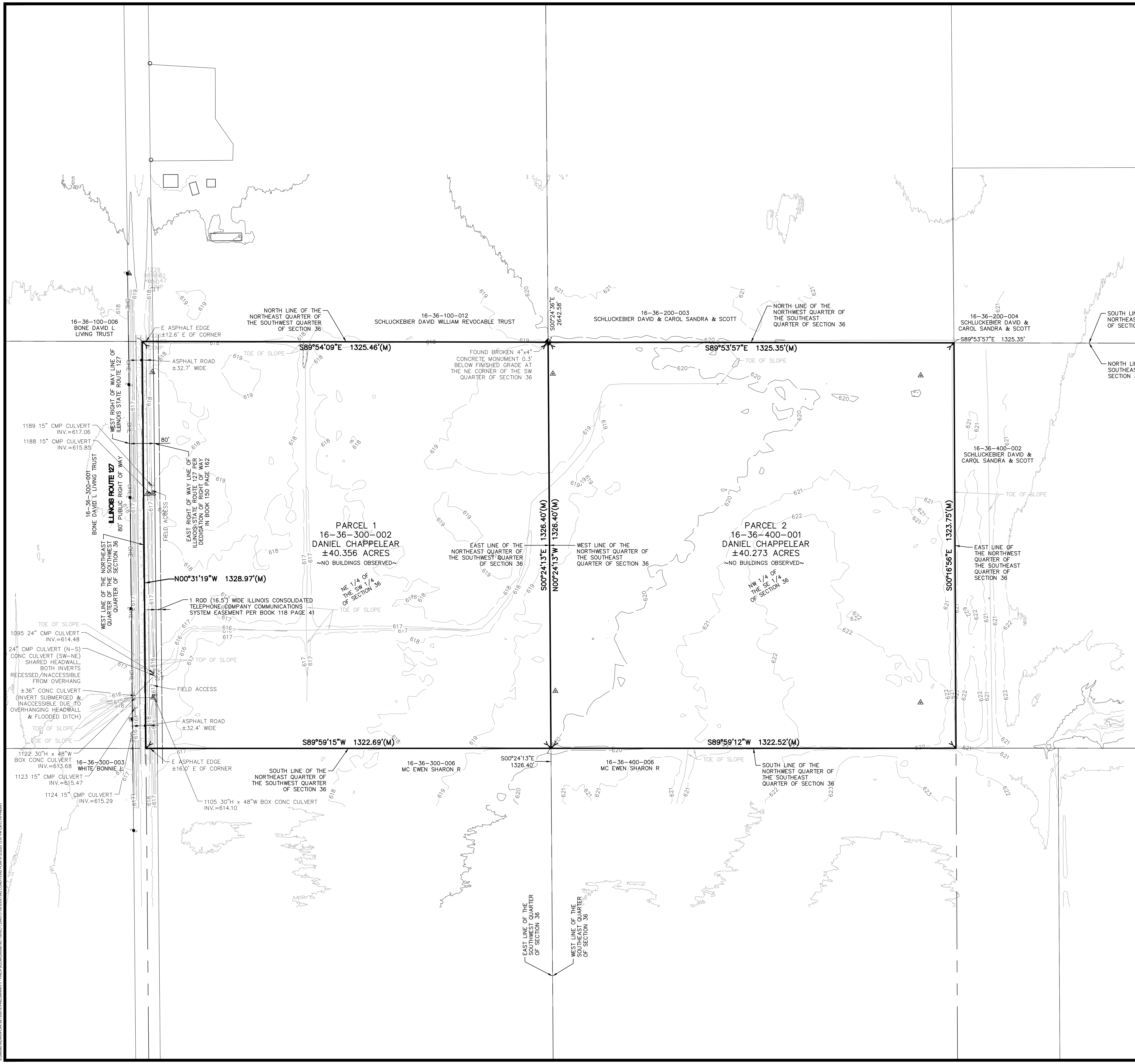
866.850.4200 www.atwell.com
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563
630.577.0800
DESIGN FIRM #184005876-0010

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

ATTRIBUTE
IRONWOOD RENEWABLES, LLC
FINCH 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
- FOUND IRON ROD
- SET IRON ROD
- FOUND PK NAIL
- FOUND MONUMENT
- EXISTING SIGN
- EXISTING BOLLARD
- EXISTING TREE
- 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
- EXISTING TELEPHONE RISER
- EXISTING TELEPHONE MANHOLE
- EXISTING TELEPHONE MARKER
- EXISTING TRAFFIC SIGNAL
- EXISTING ELECTRIC TRANSFORMER
- EXISTING ELECTRIC BOX
- EXISTING ELECTRIC METER
- EXISTING ELECTRIC MARKER
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- 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 BY 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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NAPERVILLE, IL 60563
630.577.0800
DESIGN FIRM #184005876-0010

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

ATTRIBUTE
IRONWOOD RENEWABLES, LLC
FINCH SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS

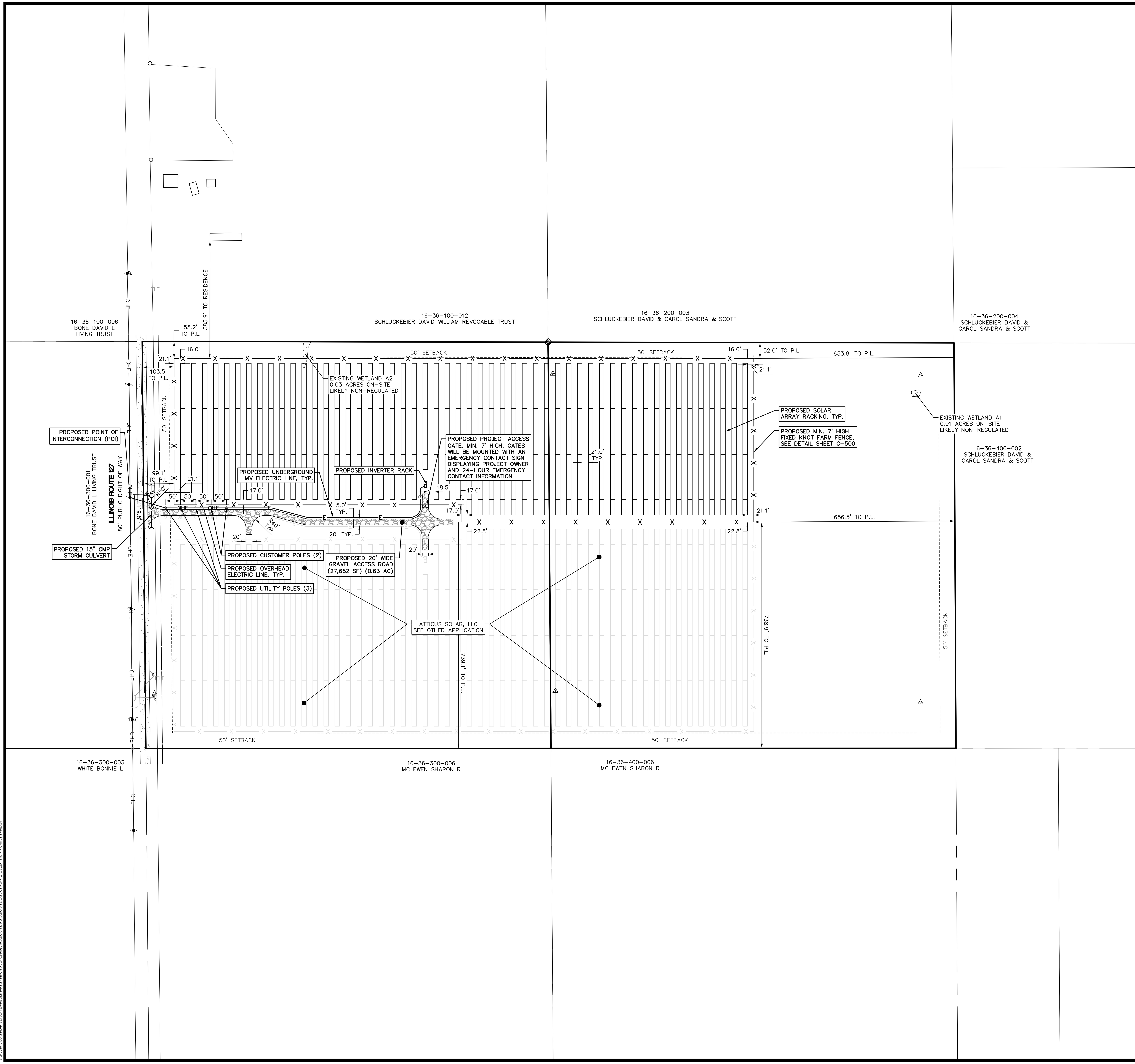
EXISTING CONDITIONS PLAN

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-100



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:	± 25.3 ACRES
FENCED AREA:	± 22.0 ACRES
PROPOSED IMPERVIOUS AREA:	± 0.64 ACRES
FEMA FLOOD HAZARD:	NOT IN FLOOD ZONE PER FHBM MAP #1709920008A DATED 01/09/1981.

SOLAR ZONING SETBACKS	REQUIRED	PROPOSED
FRONT (WEST):	50'	99.1'
SIDE (NORTH):	50'	52.0'
SIDE (SOUTH):	50'	738.9'
REAR (EAST):	50'	653.8'
NEAREST EDGE OF NON-PARTICIPATING RESIDENCE	150'	383.9'

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.

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DESIGN FIRM #184005876-0010

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

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

NOT FOR CONSTRUCTION

DATE MAY 12, 2025

REVISIONS

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1" = 150 FEET

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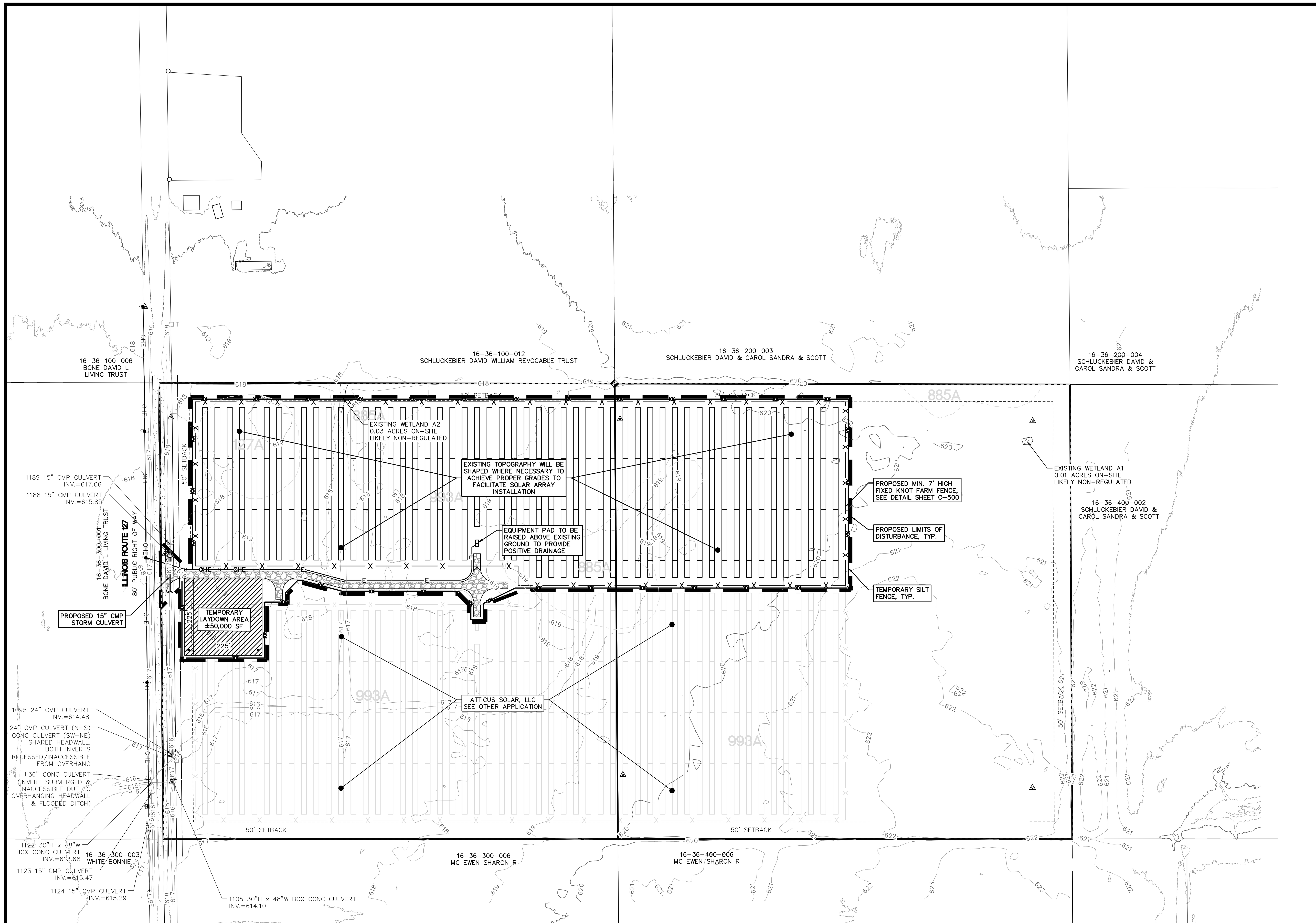
SHEET NO. C-200	



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- 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: ± 26.6 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	86

- 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	0.01
C	PASTURE; GOOD	74	1.64
C/D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	1.50
C/D	PASTURE; GOOD	80	3.06
D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	52.13
D	PASTURE; GOOD	80	21.20
–	EXISTING IMPERVIOUS AREA	98	0.44
–	PROPOSED IMPERVIOUS AREA	98	0.64
		COMBINED CN= 86	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.

S:\24009016\DWG\PLAN SETS\SITE-PRELIMINARY\1 - FINCH SOLAR\24009016C-300-G-1.DWG C-300 GRADING PLAN 5/12/2025 12:58 PM CAITLYN PREAST

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FINCH SOLAR, LLC
HILLSBORO, MONTGOMERY COUNTY, IL
SOLAR FARM DEVELOPMENT PERMIT PLANS
GRADING PLAN

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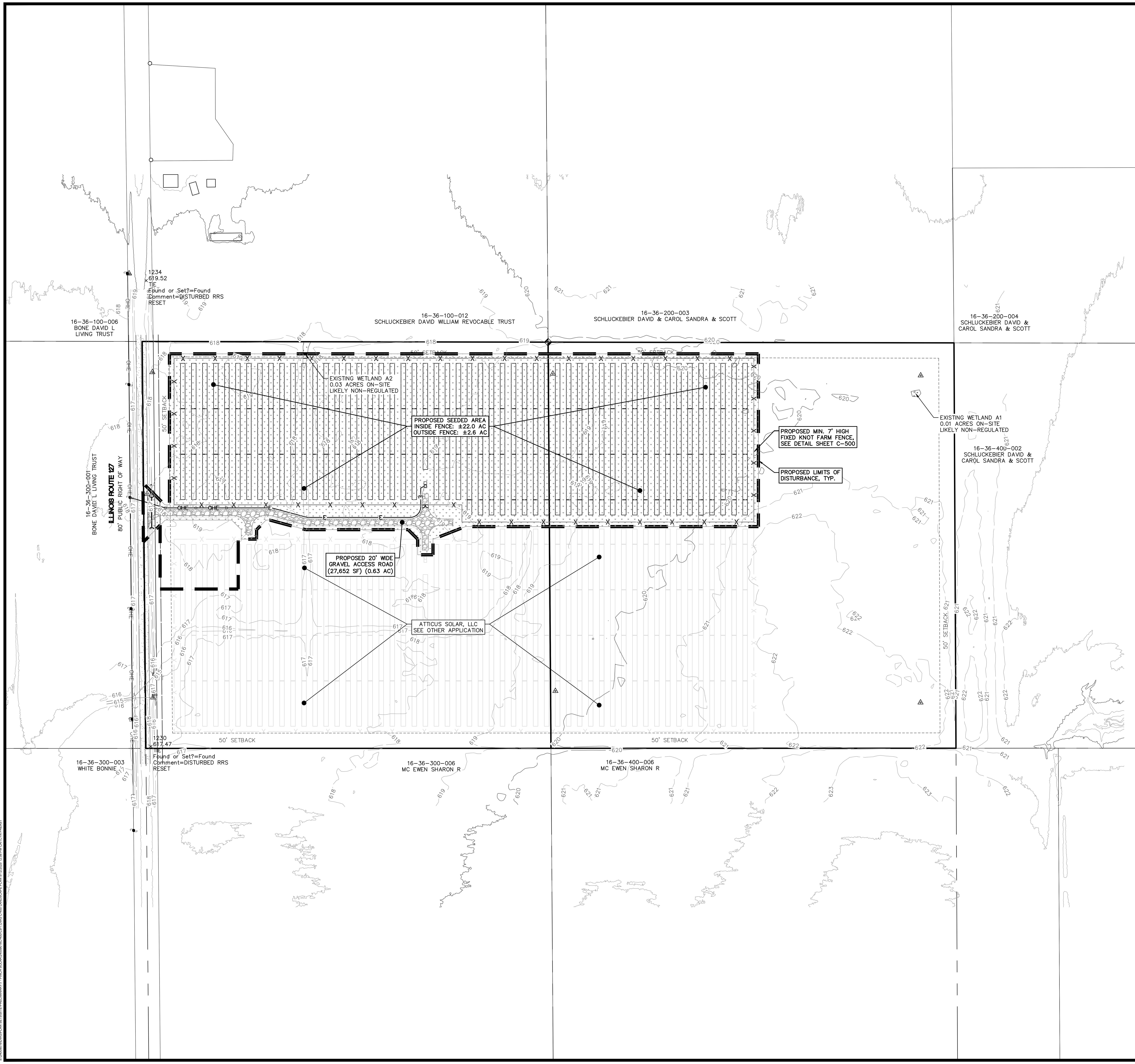

LEGEND

- BOUNDARY LINE
- EXISTING ROW
- BOUNDARY ADJACENT LINE
- SECTION LINE
- EXISTING EASEMENT LINE
- EXISTING CONTOUR (680 / 679)
- PROPOSED CONTOUR (680 / 679)
- EXISTING SETBACK LINE
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- EXISTING UNDERGROUND TELEPHONE
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- 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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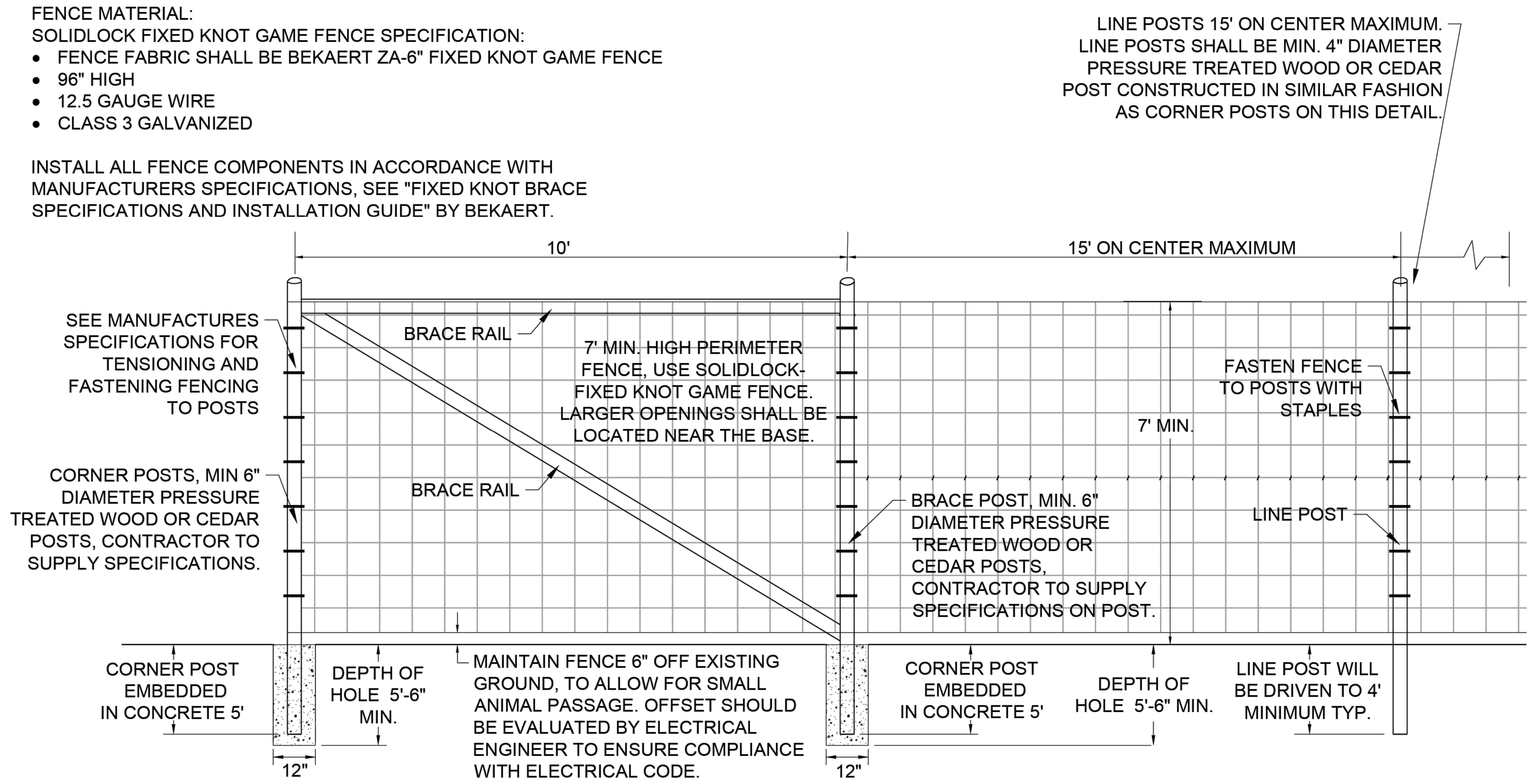
SHEET NO.
C-400

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

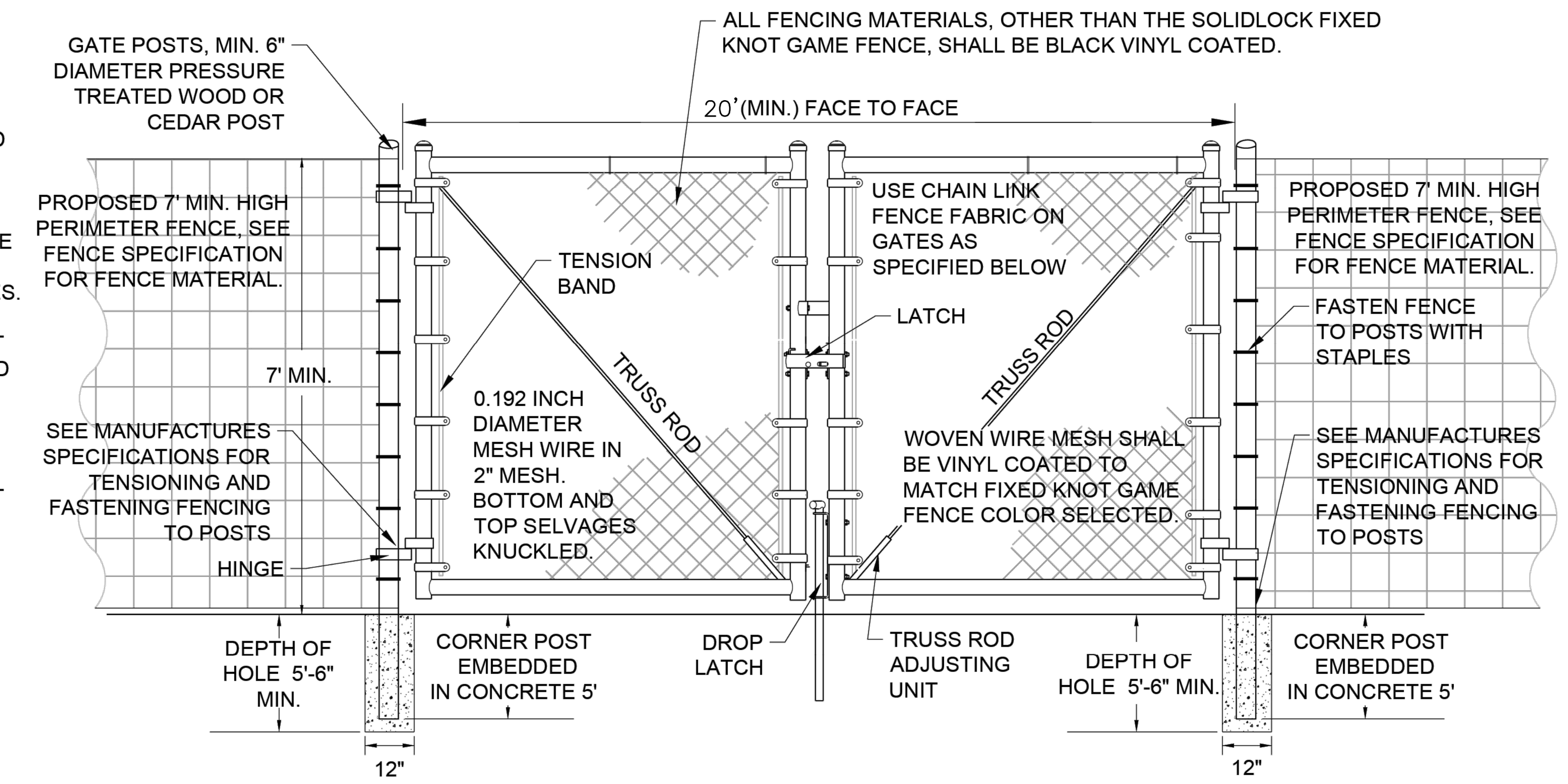
NOT TO SCALE

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

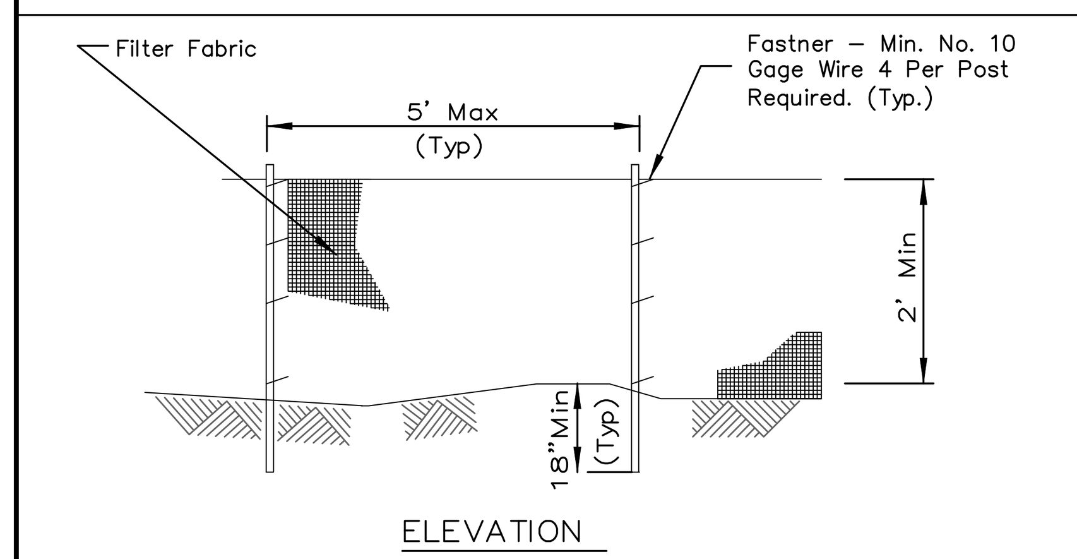
1. PAINT ALL GALVANIZED PIPE AND FITTINGS TO MATCH SOLIDLOCK FIXED KNOT GAME FENCE. PAINT SHALL BE SUITABLE FOR USE ON GALVANIZED SURFACES.
2. EMERGENCY CONTACT SIGN SHALL BE PLACED ON THE GATE, WHICH IDENTIFIES THE PROJECT OWNER AND PROVIDES A 24-HOUR EMERGENCY CONTACT PHONE NUMBER.

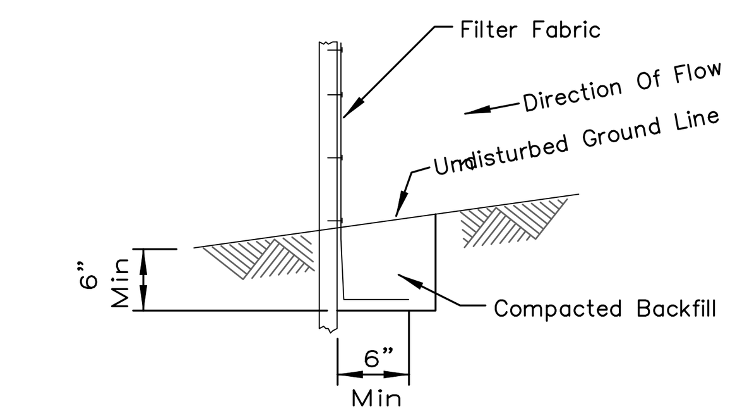


DOUBLE SWING GATE

NOT TO SCALE

SILT FENCE PLAN





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 at 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 3-16-2012
Approved ______ Date ______		

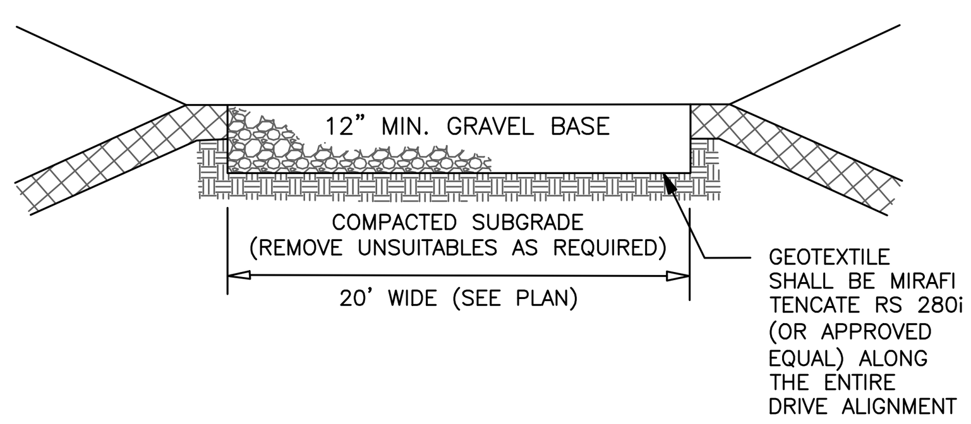
MAINTENANCE:

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.

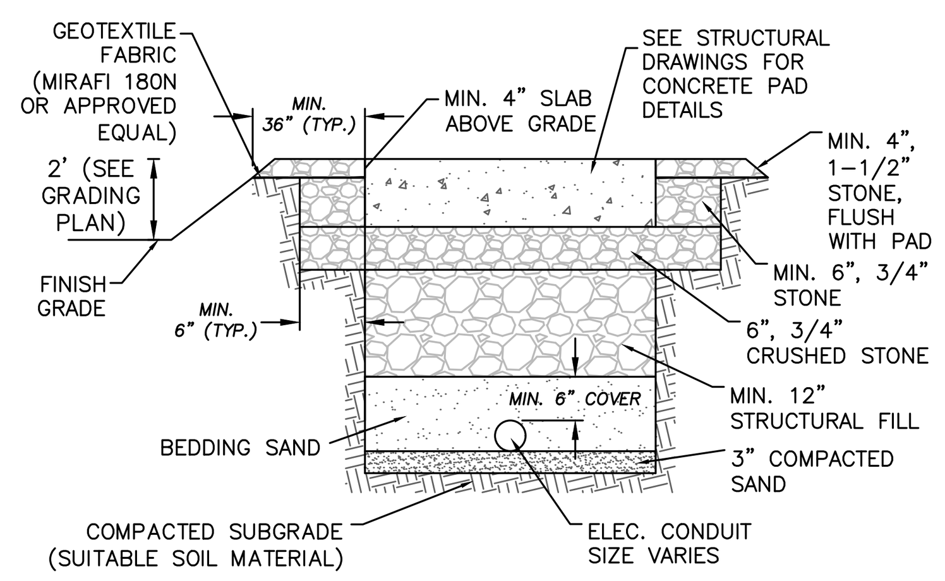


NOTES:

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.

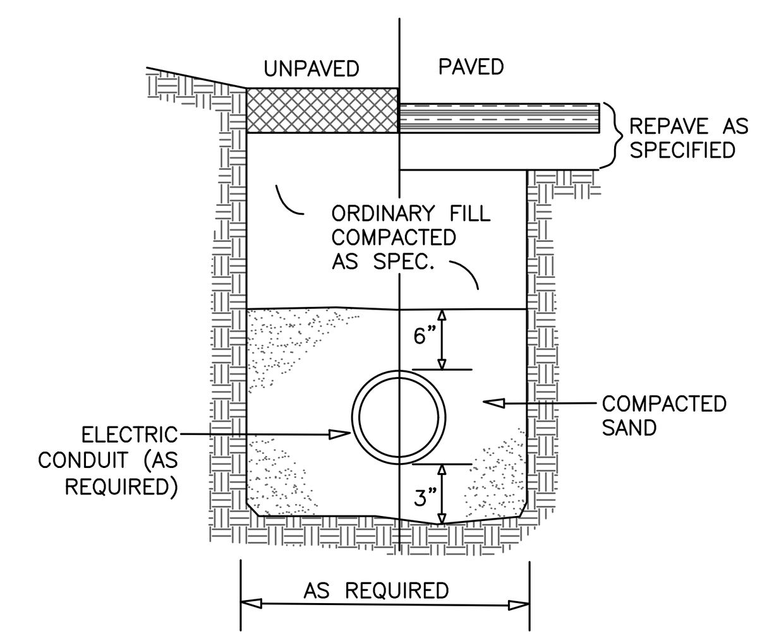
ACCESS DRIVE CROSS SECTION

NOT TO SCALE



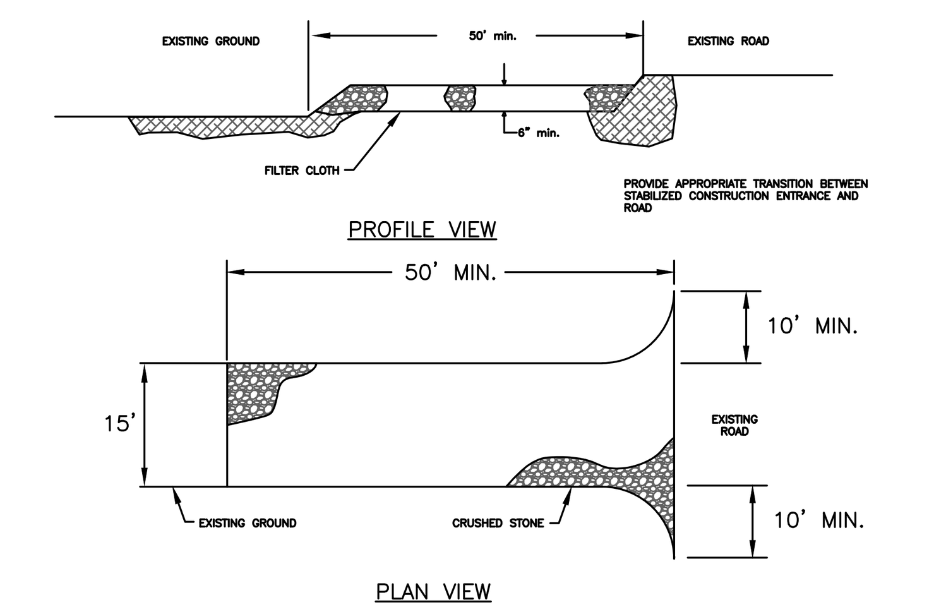
EQUIPMENT FOUNDATION DETAIL

NOT TO SCALE



ELECTRIC CONDUIT TRENCH

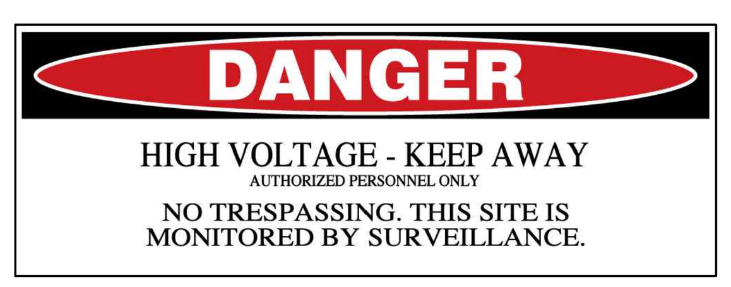
NOT TO SCALE



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



TYPICAL "DANGER" WARNING SIGN

NOT TO SCALE

TYPICAL EMERGENCY CONTACT SIGN

NOT TO SCALE

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.

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ATWELL
866.850.4200 www.atwell.com
1250 EAST DIEHL ROAD, SUITE 300
NAPERVILLE, IL 60563
630.577.0800
DESIGN FIRM #184005876-0010

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

ATTRIBUTE
IRONWOOD RENEWABLES, LLC
FINCH 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

FINCH 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

Finch 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 Illinois State Route 127
- 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.

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	Finch 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 Finch 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)	4,835	LF	$3.85	$18,614.75	27,076	$0.09	$2,436.84	$16,177.91	
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				$36,190.59			$2,436.84	$33,753.75	
Racking and Module Removal									
Pile Removal	2,200	EACH	$8.00	$17,600.00	1,155,000	$0.04	$43,312.50	($25,712.50)	Assumes W10x35 I-beams at 15' long = 525 lbs. each @ $0.0375/lb
Assembly Removal	512	EACH	$60.00	$30,700.80	76,752	$0.04	$2,878.20	$27,822.60	Assumes 150 lbs. each @ $0.0375/lb
PV Module Removal	12,792	EACH	$1.25	$15,990.00		$2,110,680.00	$2,110,680.00	($2,094,690.00)	Assumes 75% of original value ($220 original value)
PV Module Haul Off	409	TON	$45.00	$18,420.48			$0.00	$18,420.48	
Sub-Total				$82,711.28			$2,156,870.70	($2,074,159.42)	
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				**$282,455.38**			**$2,361,141.26**	**($2,078,685.88)**	

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 B Keith

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

4/30/25

Exp. 11/30/25

IRONWOOD RENEWABLES

Exhibit E: Agricultural Impact Mitigation Agreement (AIMA)

STANDARD AGRICULTURAL IMPACT MITIGATION AGREEMENT
between
Finch 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).

Finch 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 Finch 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

Clay Nordsiek

By Clay Nordsiek, Deputy General Counsel

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

5/6, 2025

Finch Solar, LLC

By Adrian Ortlieb

910 Haring St.
Lafayette, LA 70503

Address

January 13th, 2025

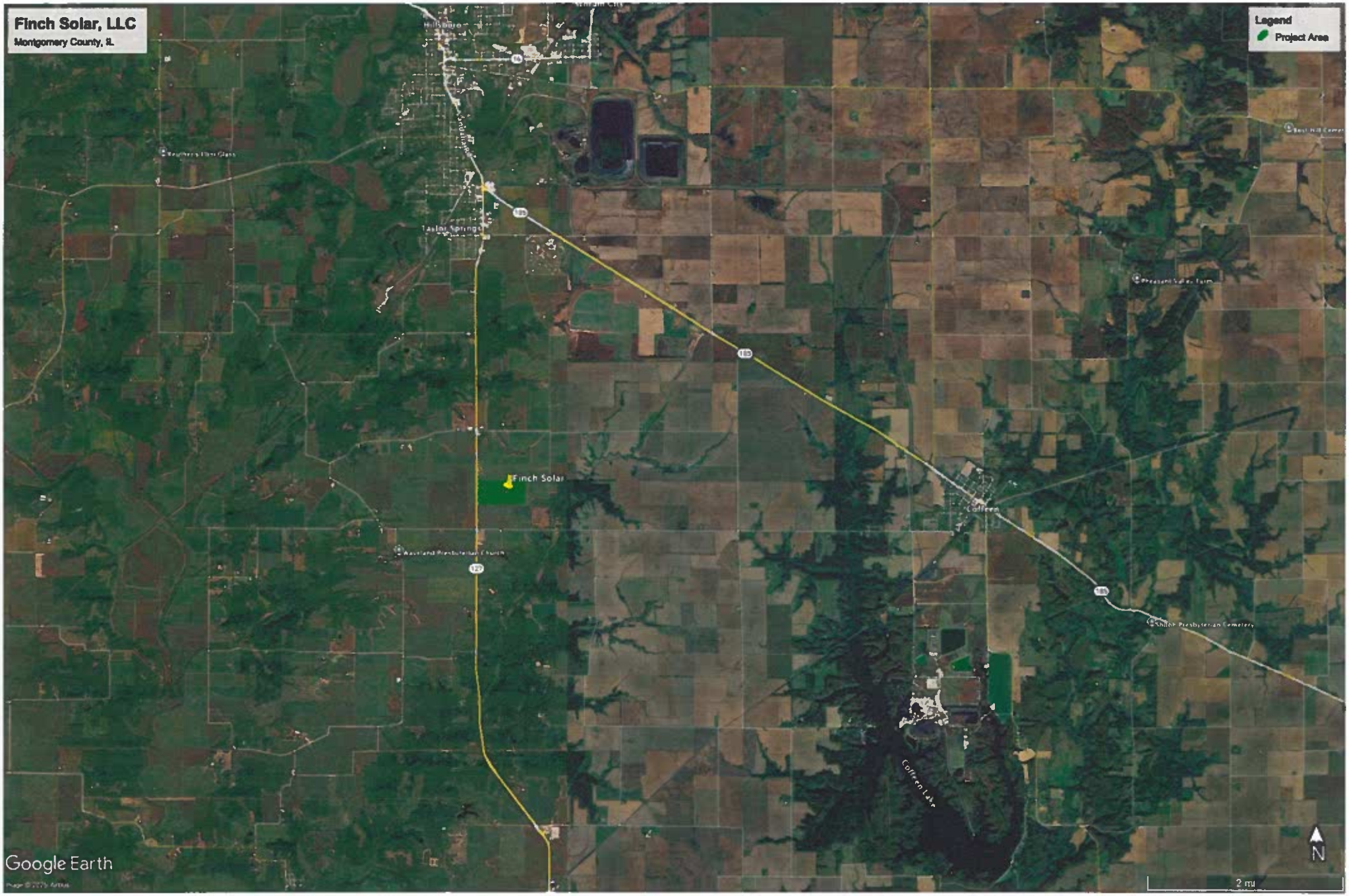
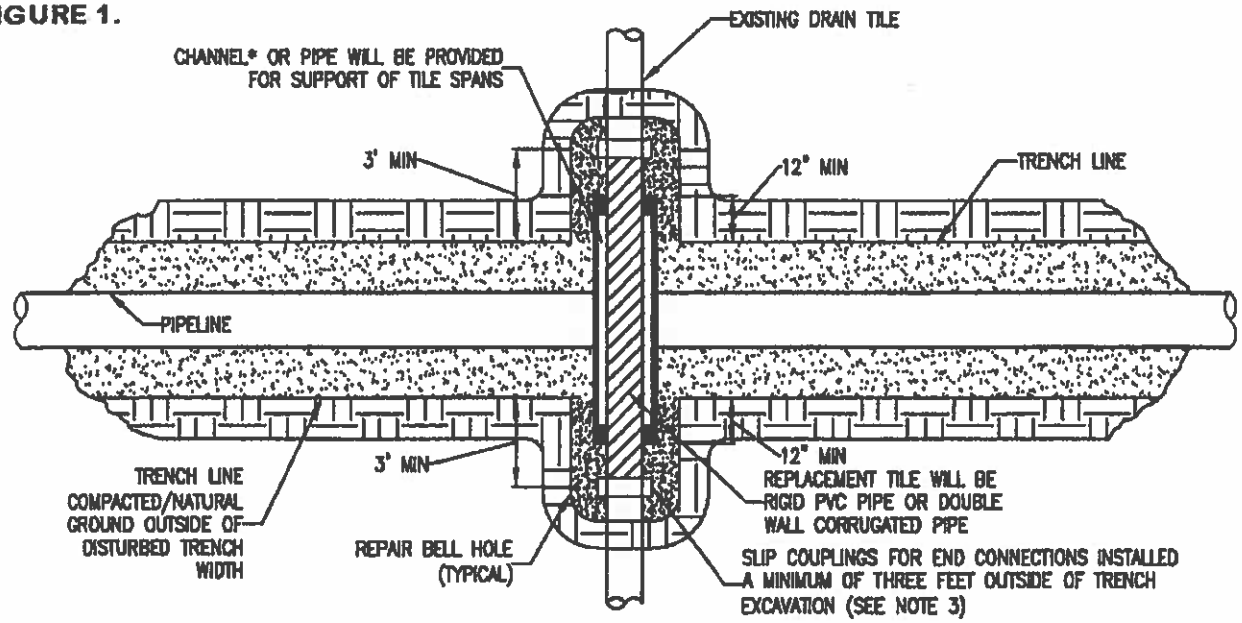
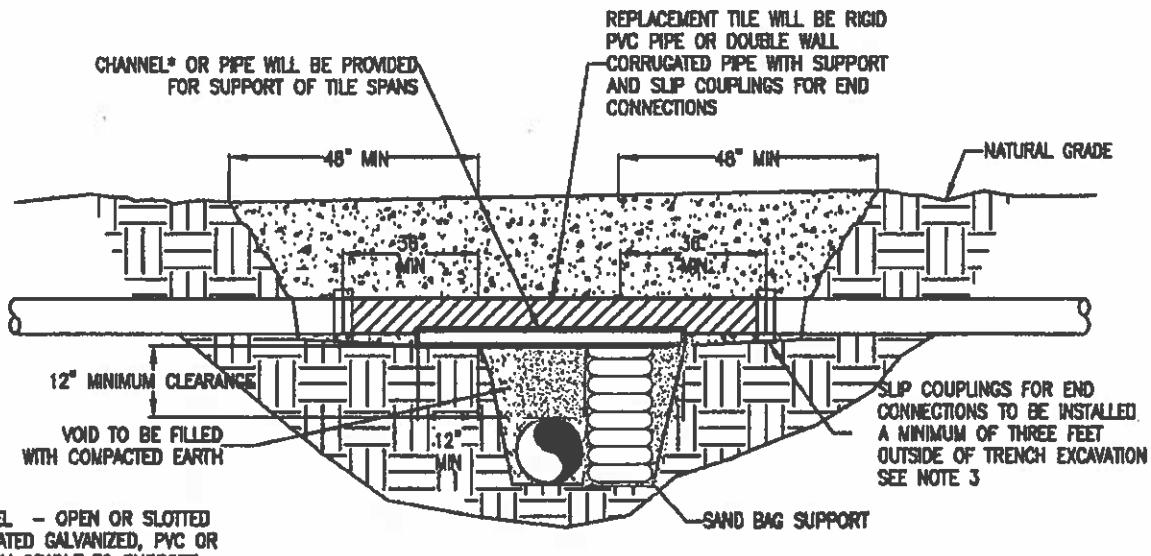

Finch Solar, LLC
Montgomery County, IL
Legend
Project Area
Taylor Springs
Finch Solar
Coffeen
Coffeen Lake
Google Earth
N
2 mi

FIGURE 1.



PLAN
N.T.S.



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

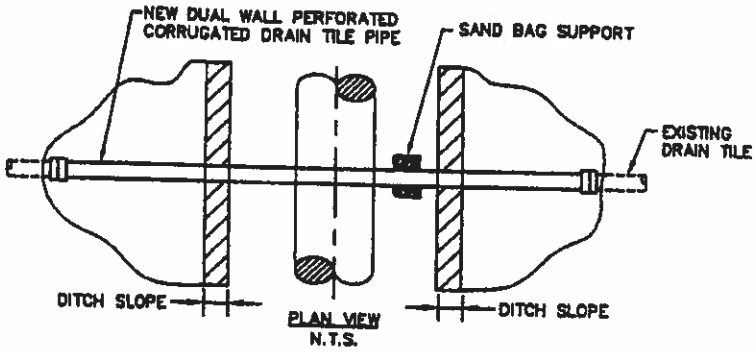
CROSS SECTION
N.T.S.

NOTE:

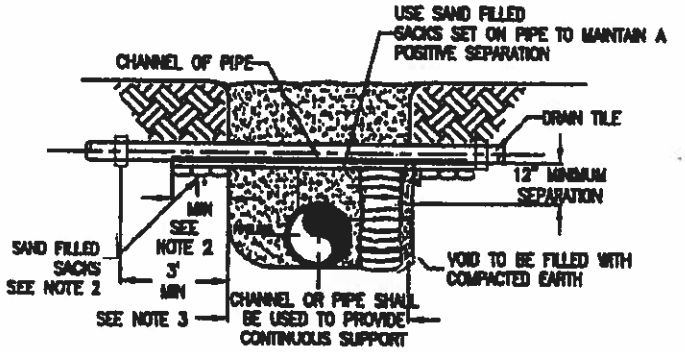
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR 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.

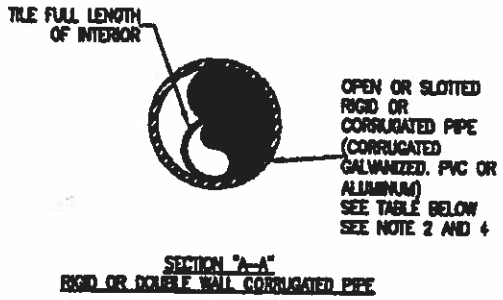
TEMPORARY DRAIN TILE REPAIR

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.
6"-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

IRONWOOD RENEWABLES

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

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Applicant: Finch Solar, LLC
Contact: Keith Morel
Address: 910 Harding St
Lafayette, LA 70503

Project: Finch Solar, LLC
Address: Illinois State Route 127, Hillsboro

IDNR Project Number: 2512508
Date: 04/30/2025

Description: Community Solar Project

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.

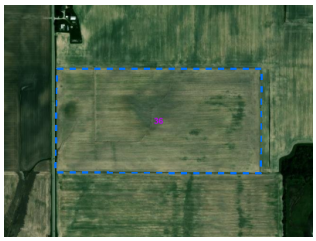
Consultation is terminated. This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented 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.

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

EcoCAT Receipt

Project Code 2512508

APPLICANT	DATE
Finch Solar, LLC Keith Morel 910 Harding St Lafayette, LA 70503	4/30/2025

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: Finch Solar, LLC

Project Code: 2025-0093317

Location: Montgomery County, Illinois

Date: May 6, 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 May 6, 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 May 6, 2025)
- USFWS Midwest Region “No Effect” Determination Guidance
- Project Site Map & Description

5. Conclusion

This memo documents that the Finch 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: Finch Solar, LLC

Date: May 6, 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: 05/06/2025 21:31:45 UTC
Project Code: 2025-0093317
Project Name: Finch 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: 2025-0093317
Project Name: Finch Solar, LLC
Project Type: Power Gen - Solar
Project Description: 5 MW community solar farm.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.091661349999995,-89.48245052283663,14z

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: Keith Morel
Address: 910 Harding St.
City: Lafayette
State: LA
Zip: 70503
Email kmorel@ironwoodenergy.com
Phone: 3378893940

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

Gmail Keith Morel <kmorel@ironwoodenergy.com>

Request for SHPO Review Determination Letter-Finch Solar

2 messages

Keith Morel <kmorel@ironwoodenergy.com> Thu, Mar 13, 2025 at 8:27 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.

--

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-Finch SHPO Cover Letter.pdf
142K

Finch Solar Aerial.pdf
5899K

April 1998 Aerial of Project Area (Finch Solar).pdf
4444K

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

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

Keith Morel <kmorel@ironwoodenergy.com> Thu, Mar 13, 2025 at 9:37 AM

Illinois Department of Natural Resources
JB Pritzker, Governor • Natalie Phelps Finnie, Director
One Natural Resources Way • Springfield, Illinois 62702-1271
www.dnr.illinois.gov

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

PLEASE REFER TO: SHPO LOG #001031325

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

IRONWOOD RENEWABLES

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

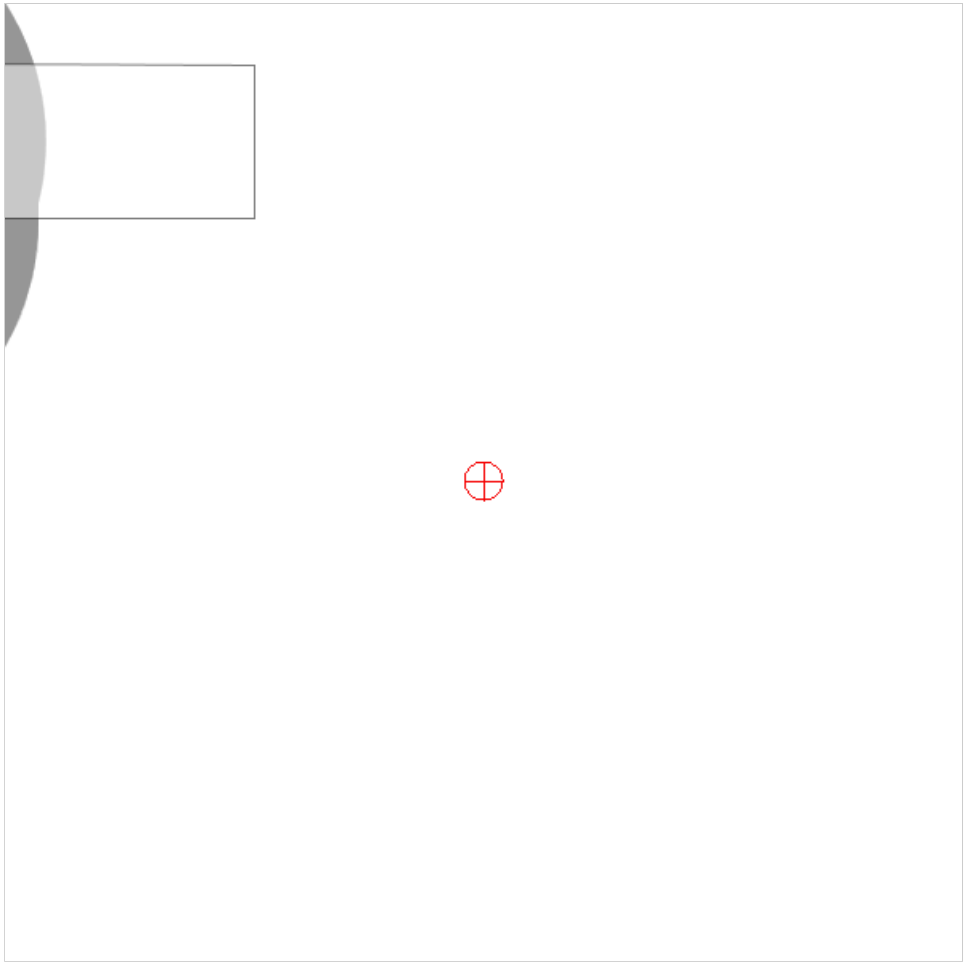
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport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

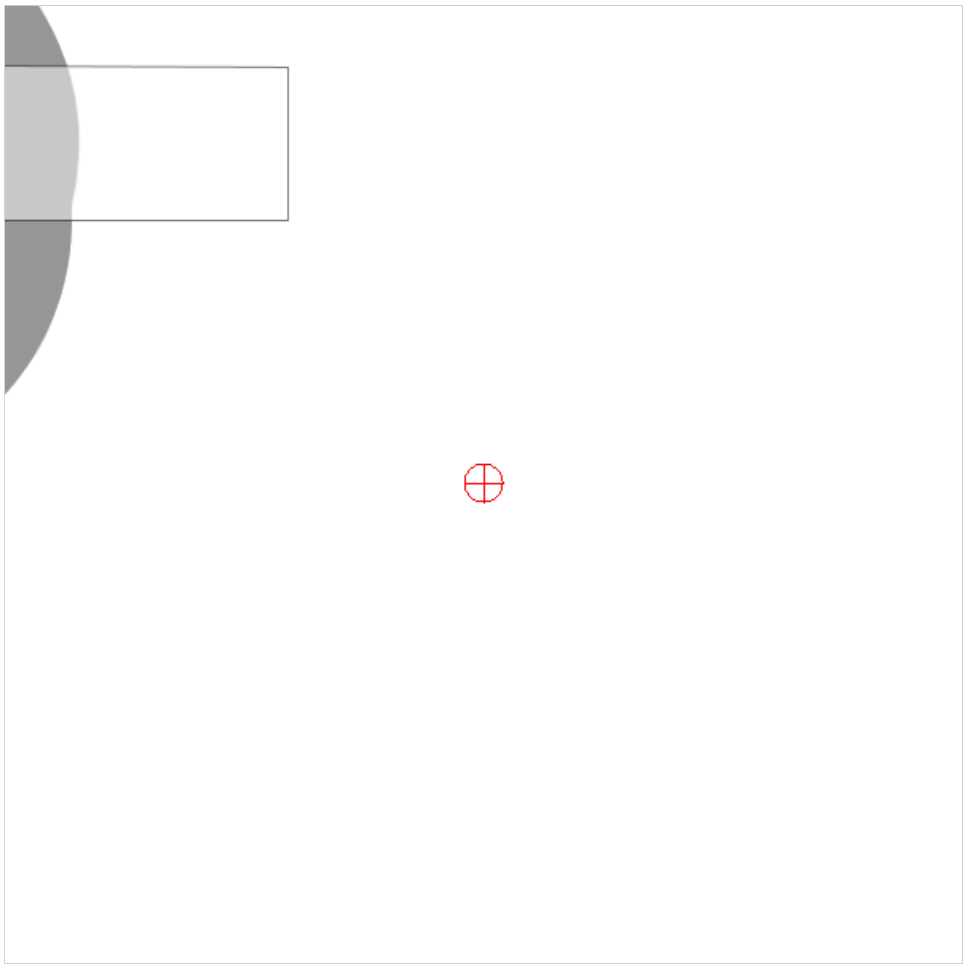
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport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

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

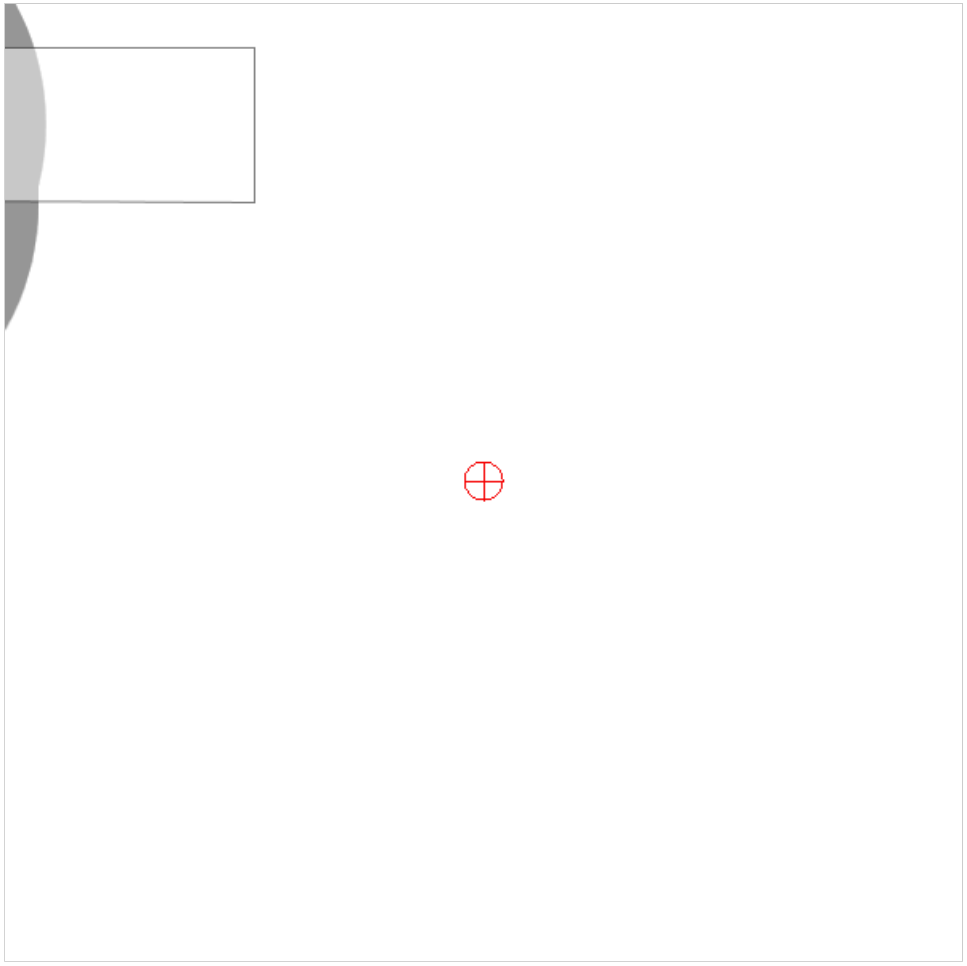
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport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

- 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 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.

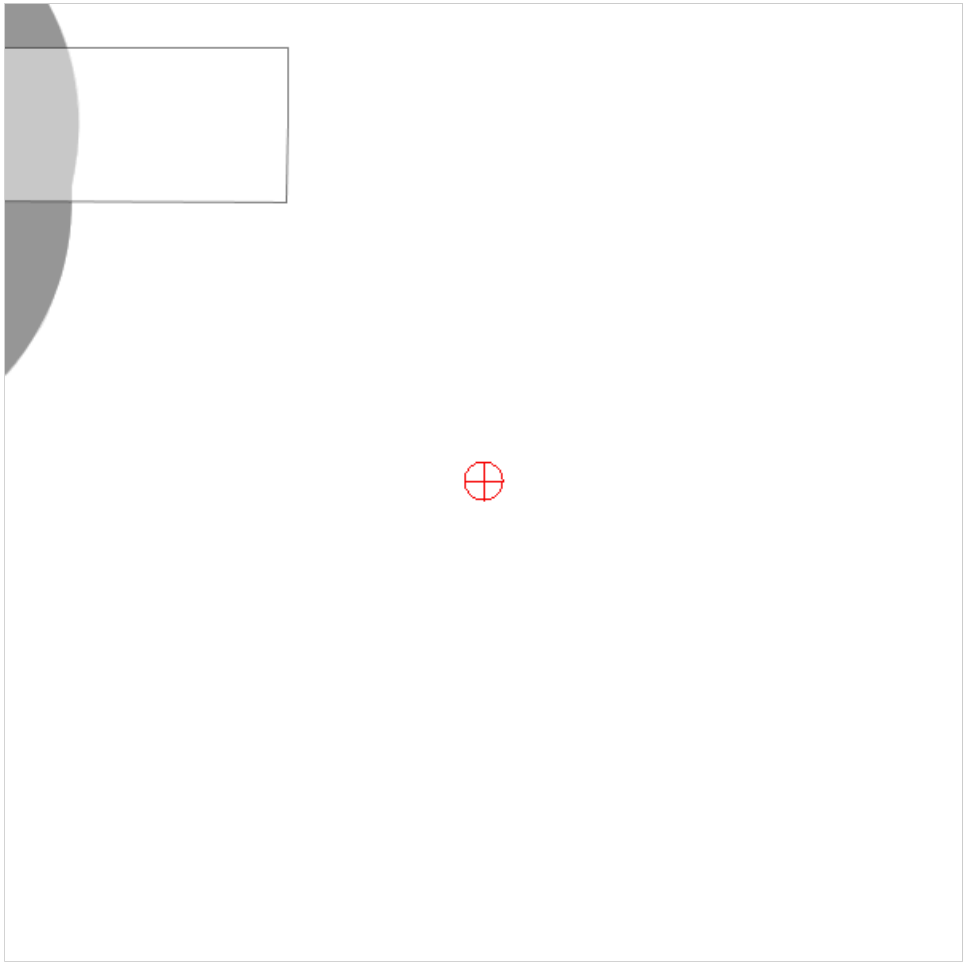
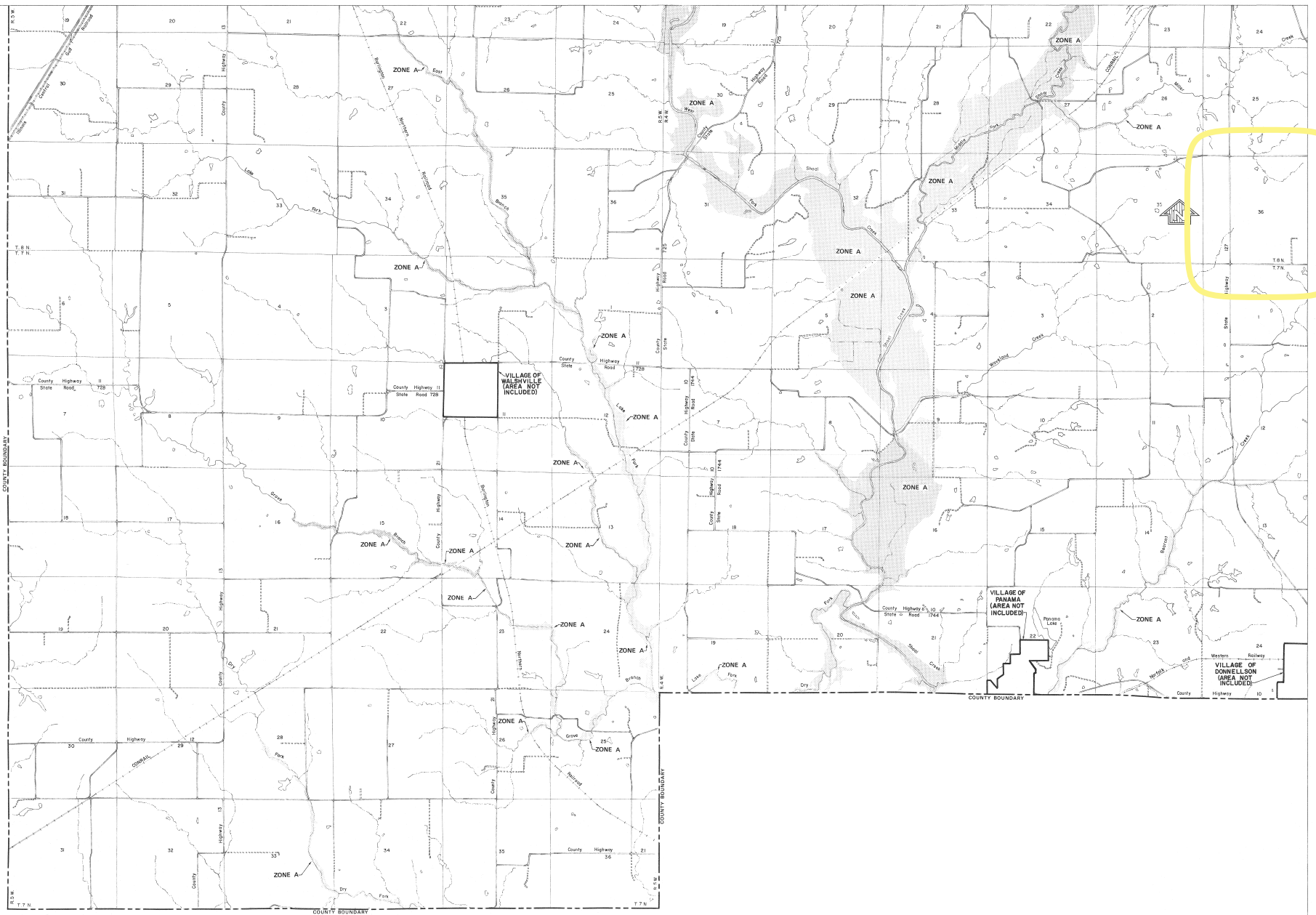


Exhibit J: FEMA



KEY TO SYMBOLS

SPECIAL FLOOD HAZARD AREA — ZONE A

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

TO DETERMINE IF FLOOD INSURANCE IS AVAILABLE IN THIS COMMUNITY, CONTACT YOUR INSURANCE AGENT OR CALL THE NATIONAL FLOOD INSURANCE PROGRAM AT (800) 638-6620, OR (800) 424-8872.

APPROXIMATE SCALE IN FEET
2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FHBM

FLOOD HAZARD BOUNDARY MAP

MONTGOMERY COUNTY, ILLINOIS

UNINCORPORATED AREA

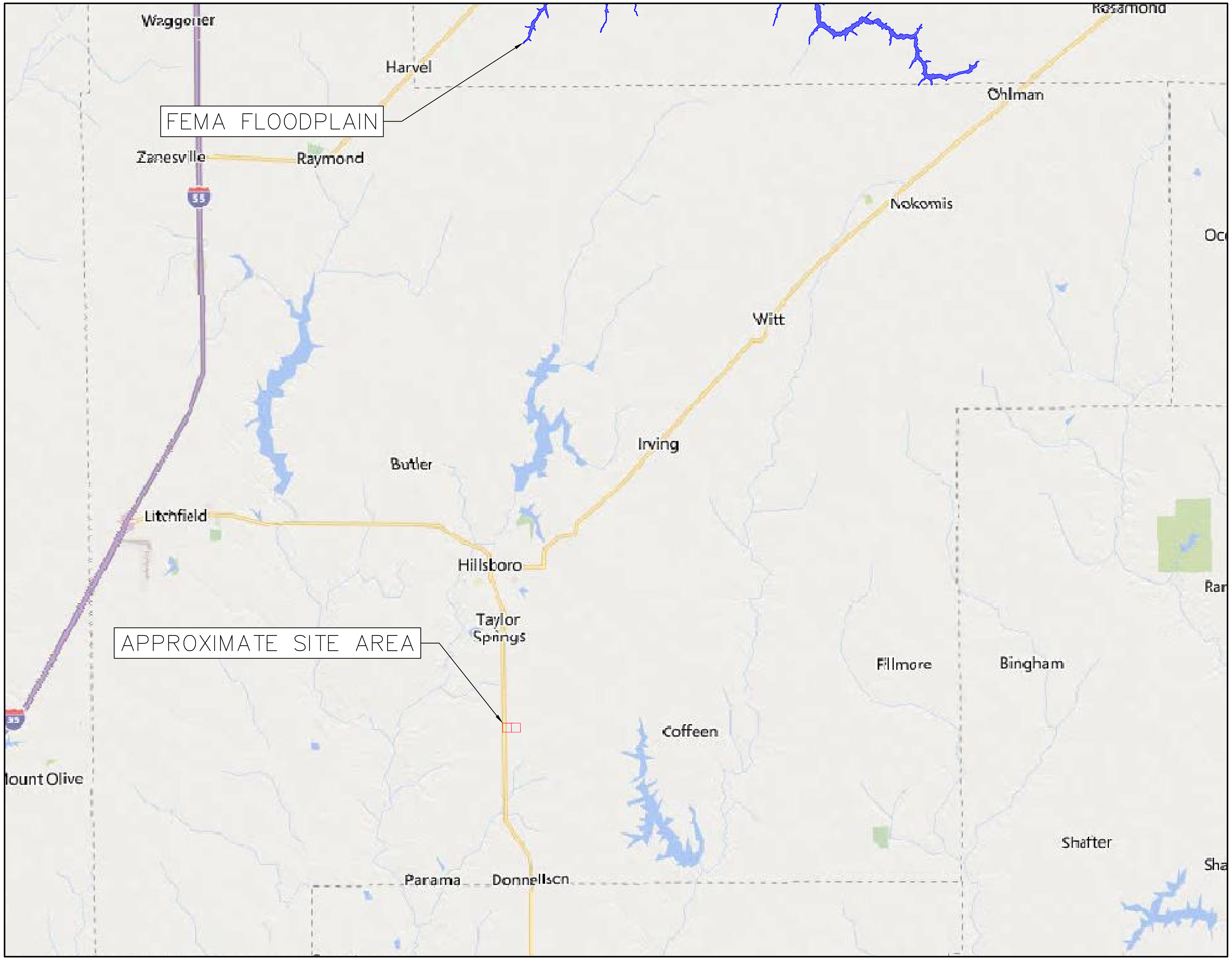
PANEL 8 OF 9

(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.

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.

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248.447.2000

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

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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

IRONWOOD RENEWABLES

Exhibit K: Health and Safety Studies

WHITE PAPER

Health and Safety Impacts of Solar Photovoltaics

By Tommy Cleveland
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.

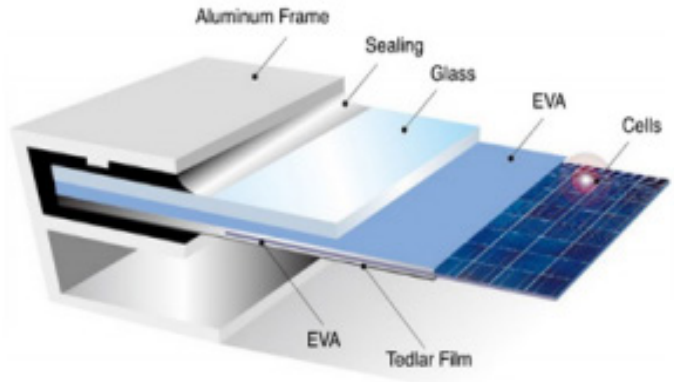

Figure 2: Components of crystalline silicon panels. The vast majority of silicon panels consist of a glass sheet on the topside with an aluminum frame providing structural support. Image Source: www.riteksolar.com.tw

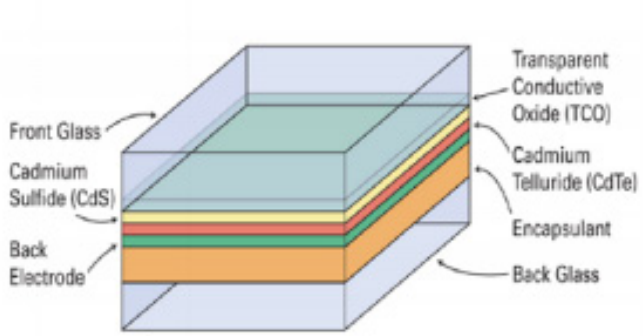

Figure 3: Layers of a common frameless thin-film panel (CdTe). Many thin film panels are frameless, including the most common thin-film panels, First Solar's CdTe. Frameless panels have protective glass on both the front and back of the panel. Layer thicknesses not to scale. Image Source: www.homepower.com

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 (SiO2) 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 superheated 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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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.

- Type of PV Technology Used: 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.
- Design Wind Speed: 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.

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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.

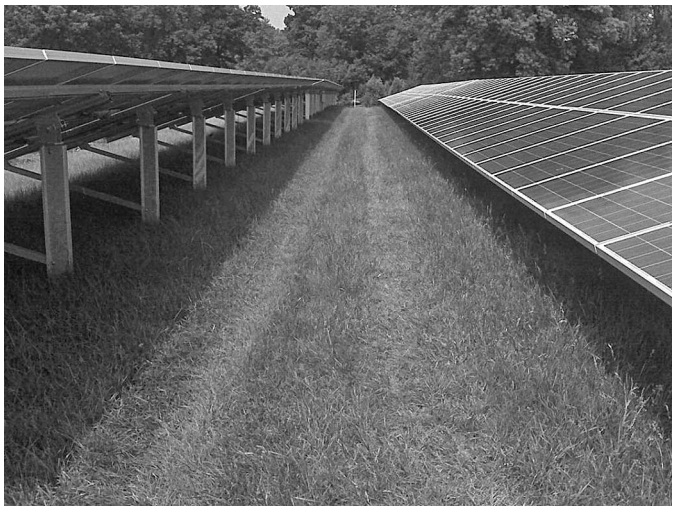

Fig. 1. Maintenance or "spacer" section between two rows of solar panels (photo by John E. Showler, reprinted with permission)

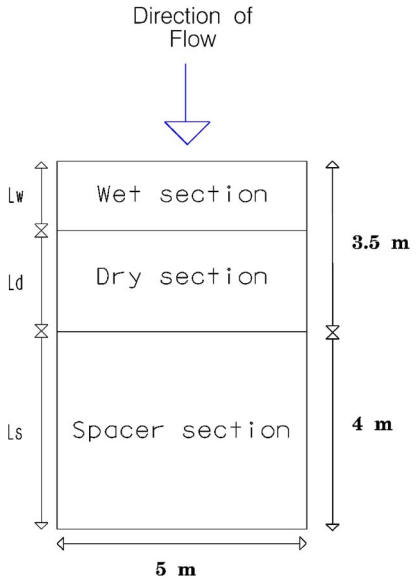

Fig. 2. Wet, dry, and spacer sections of a single cell with lengths *Lw*, *Ls*, and *Ld* with the solar panel covering the dry section

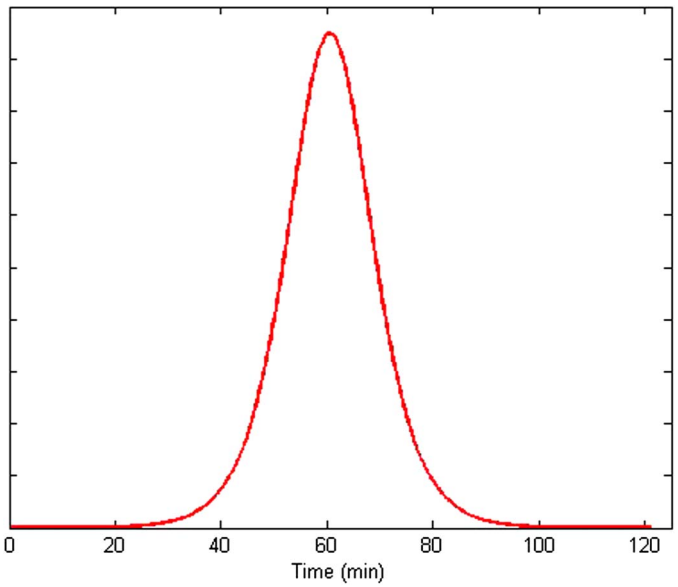

Fig. 3. Dimensionless hyetograph of 2-h Type II storm

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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

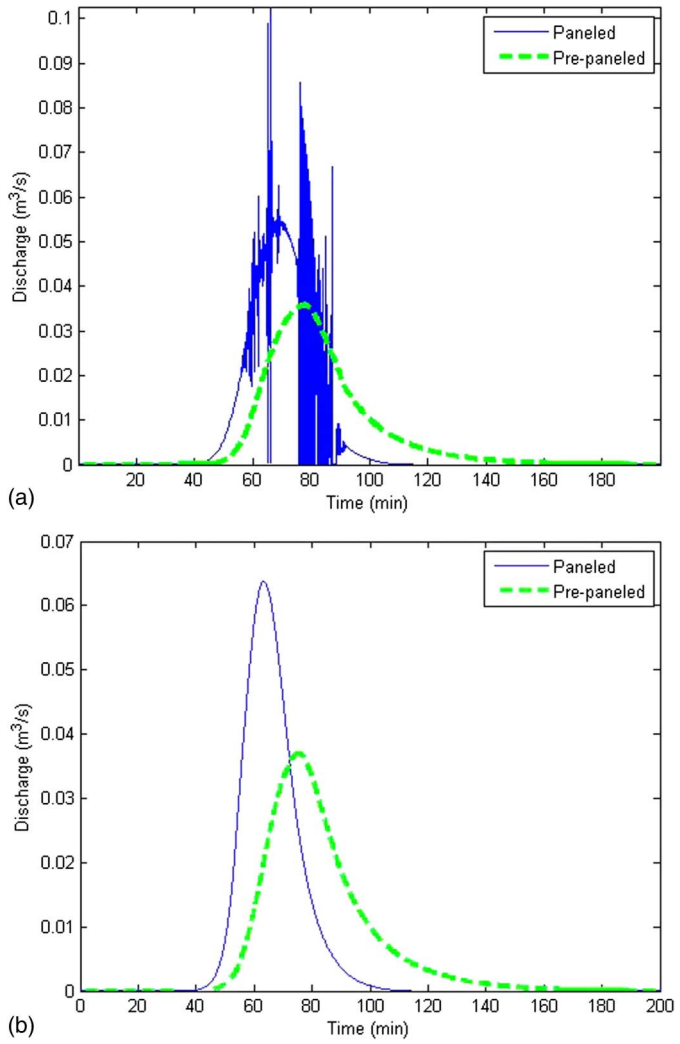

Fig. 4. Hydrograph with time increment of (a) 12 s; (b) 3 s with Manning's n for bare ground

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.

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 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.

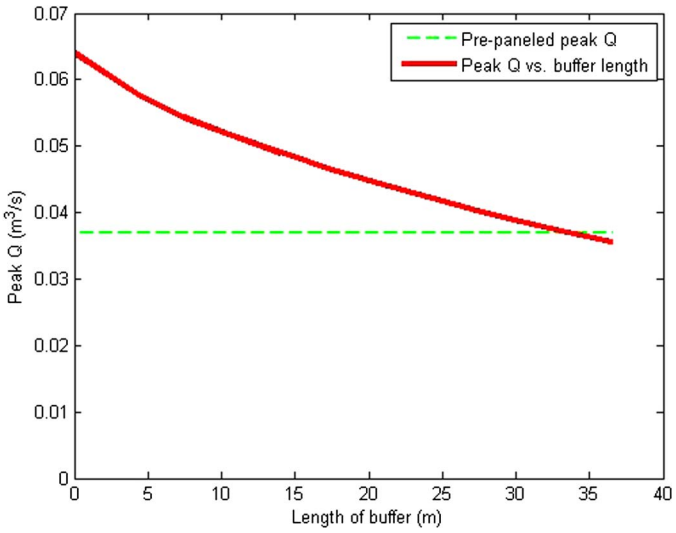

Fig. 6. Peak discharge over gravel compared with buffer length

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.
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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
Environmental Technician
Environmental Services Group

Don Berninger
Project Manager
Environmental Services Group

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

REFERENCES

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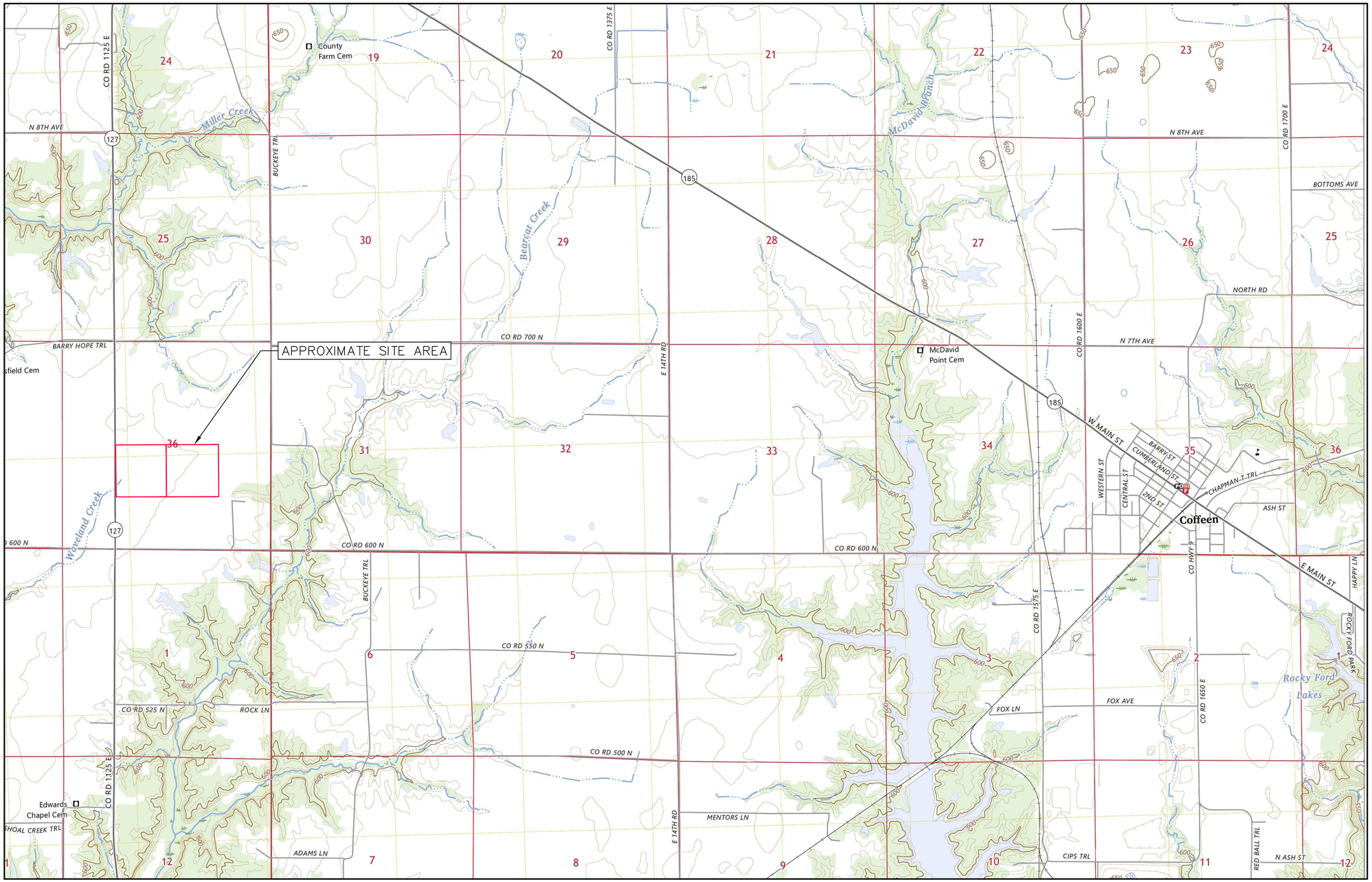

LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

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MONTGOMERY COUNTY, ILLINOIS

CLIENT
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HILLSBORO TOWNSHIP,
MONTGOMERY COUNTY, IL

SITE LOCATION MAP

DATE 02/20/2025

REVISIONS

SCALE: 1"=750' (0, 375', 750')

DR. NF	CH. BS
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SHEET NO. 01	

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LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

EXISTING WETLAND (LIKELY NON-REGULATED)

EXISTING WATERCOURSE (CENTERLINE)

EXISTING WATERCOURSE (TOP OF BANK)

EXISTING CULVERT

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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WETLAND LOCATION MAP

DATE 02/19/2025

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SCALE: 1"=150'

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P.M. BS	
BOOK --	
JOB 24009016	
SHEET NO. 01	

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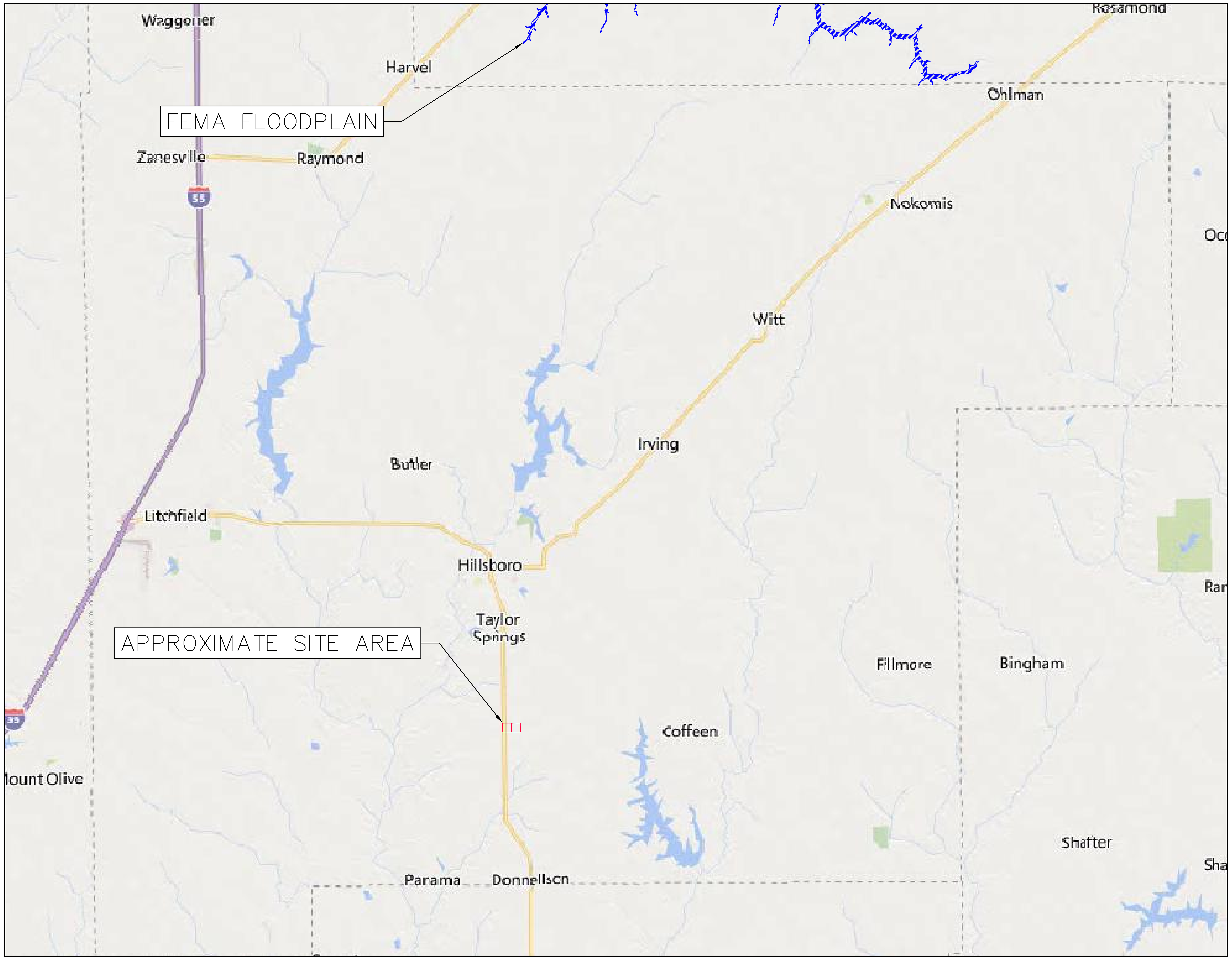

LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

FEMA FLOODPLAIN

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

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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

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.

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:
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)	%	Redox Features Color (moist)	%	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)	%	Redox Features Color (moist)	%	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 ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	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.			
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)	%	Redox Features Color (moist)	%	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 _____	**Is the Sampled Area within a Wetland?** **Yes ✓** **No _____**
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	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)	%	Redox Features Color (moist)	%	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 ___

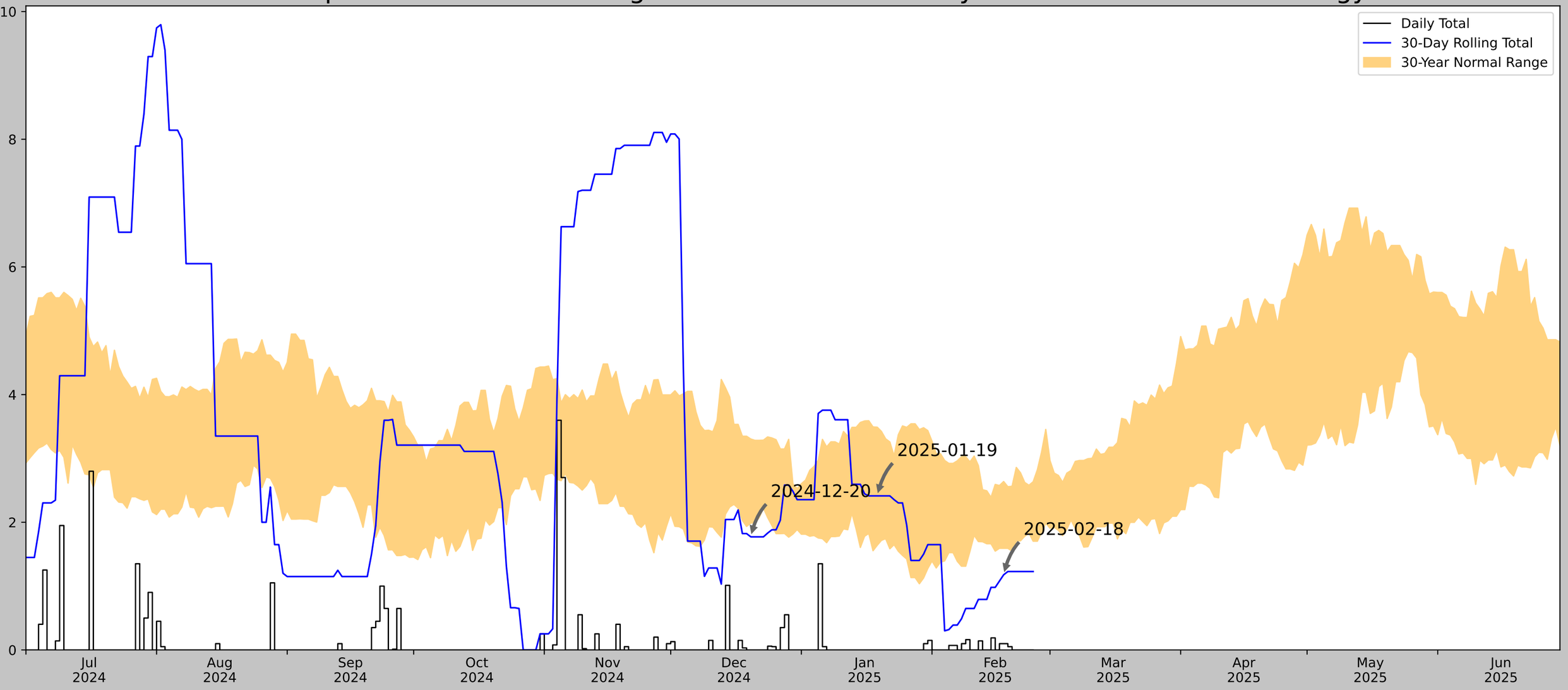
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

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

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

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

IRONWOOD RENEWABLES

Exhibit M: Structural Engineer's Geotechnical Assessment

May 15, 2025

Adrian Ortlieb
Ironwood Renewables, LLC
PO Box 51794
Lafayette, Louisiana 70505
Via e-mail: adrian.ortlieb@ironwoodenergy.com

Finch Solar – Suitability of Subsurface Conditions for Photovoltaic Facility Development
Hilsboro, Illinois

Dear Adrian:

ANS Geo is pleased to provide this letter to Ironwood Renewables, LLC to provide our engineering evaluation for the suitability of the subsurface (geotechnical) conditions at the Finch Solar project site in Hilsboro, Illinois to support a proposed photovoltaic facility.

1.0 Background

We understand that the project is expected to generate 5 MWac, and will consist of 35 fenced-in, buildable acres. Given the project development falls under the definition of a "Commercial Solar Energy Facility (CSEF)", as defined in the Montogomery County Ordinance, under *Section F. Principle Uses*, Item 2. Solar Farms requires the following:

> *b. Foundation: A qualified engineer shall certify that the foundation and design of the solar panels racking, and support is within accepted professional standards, given local soil and climate condition.*

2.0 Evaluation of 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), and the USDA's Natural Resources Conservation Service (NRCS). 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 loam, and 1.0% Virden-Fosterburg silt loams. 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.

As referenced in the NRCS Report, while potential concerns may be identified by the publicly-available data, site-specific detailed engineering studies such as a geotechnical investigation will provide further information to manage the potential concerns of corrosion, shallow excavation, and the required embedment of post-supported solar racking and modules. Notwithstanding, ANS Geo has performed a high-level engineering evaluation to determine the suitability of the site to support photovoltaic development. We have summarized our considerations in **Table 1** below.

Table 1: Hazard Summary Table

Potential Hazard	Comment
Ponding	It is anticipated that fine-grained soils (predominantly silt/clay and some amount of sand) will be encountered across the project site. The presence of low permeability fine-grained material on site, as typical with any development, will necessitate stormwater and precipitation to be managed by proper civil/site design. This, however, does not pose a fatal flaw for development of this site as drainage, vegetation, and other site features can be properly designed by an experienced civil engineer.
Depth to Saturated Zone	A static groundwater table is not expected within the shallow depths of where excavations will be made for site structures. Therefore, it is not anticipated that extensive groundwater dewatering or the pumping or removal of groundwater for the construction and operation of this project will be required.
Shrink Swell (Expansive Soils)	Given ANS Geo's experience with other projects in Montogomery County and surrounding areas, and observed soil conditions from the USGS "Swelling Clays Map of the Conterminous US", it is our professional opinion that the native on-site soils will exhibit low shrink/swell potential.
Frost Action/Ad-Freeze Stresses	Due to the location of the project, the likelihood for frost action will need to be considered for foundation design for the proposed facility. However, this is a typical consideration for all structures, including photovoltaic facilities, in this project region. This consideration will be accommodated by embedding support piles to below the frost depth, to counter-act ad-freeze, as well as embedding shallow foundations below frost depth.
Low Strength Soils	ANS Geo does not anticipate low-strength soils at the project site. Should soil properties be softer than desired, proper engineering measures can be taken for foundation design, such as increasing the depth of the support posts for racking and module support.
Corrosion of Steel	While the NRCS Report indicates corrosion of steel is a potential concern, this potential concern is very easily mitigated by the use of additional sacrificial steel to accommodate the planned service life of the facility and buried foundation components, and/or the use of galvanization on buried, ferrous metal steel components. If corrosion is of concern, a minimum zinc coating thickness in accordance with ASTM Standard A123 can be followed to ensure piles can meet design loads throughout project lifetime.
Corrosion of Concrete	Based on our experience in the project region, we do not expect a large concentration of sulfates in the soil or groundwater. Therefore, we do not anticipate any impact to the proposed facility with respect to the corrosion of buried concrete.
Slope Failure	The project site is relatively flat to gentle-sloping topography with an approximate average 0 – 5% slope; therefore, no slope failure is expected.
Earthquake – Seismicity	The project area is mapped within a low-hazard zone based on the USGS "2023 Long-term National Seismic Hazard Map"; therefore, seismicity is not expected to be a concern for the proposed site development.

3.0 Certification of Suitability

Through our review of the available Natural Resource Inventory (NRI) Report for the project site, ANS Geo's site-specific assessment, and our experience in the vicinity of the project and throughout the State of Illinois for similar projects and subsurface conditions, it is ANS Geo's professional opinion that there are no fatal flaws for the development of this site as a photovoltaic project. Therefore, in **ANS Geo's opinion, the specific soils and subsurface conditions at the site can support the proposed solar equipment and appurtenances, given local soil, subsurface and climate conditions.**

4.0 Qualifications of Preparer and Firm

ANS Geo, Inc. is a consulting engineering, material testing, and special inspection firm founded in 2005. We specialize in civil, geotechnical, structural, and construction engineering, and maintain two in-house, full-service soil material testing laboratories. We also offer geophysical investigations for geohazards such as karst, bedrock mapping, and sinkhole evaluation, as well as construction monitoring, special inspections, and materials testing.

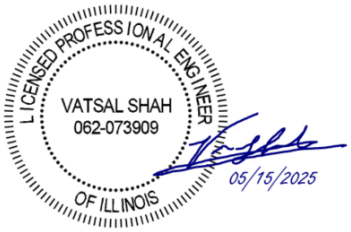
ANS Geo has supported over 110 renewable energy projects in the State of Illinois, with projects ranging from less than one megawatt in size to over 100 MW. In addition, ANS Geo has completed geotechnical (subsurface) investigations for over 47 GW of solar, battery store, and on-shore wind renewables projects across the US. Our experience spans 46 states, and we have covered all seven US regions including the Pacific Northwest, West, South West, Mid-West, Mid-Atlantic, and Northeast.

5.0 Limitations

It should be noted that this evaluation is not intended to replace a conventional geotechnical investigation, proper engineering evaluation, and design. While regional subsurface mapping provides general and useful information about the expected subsurface conditions and geohazard risks, a site-specific investigation must be conducted to confirm the assumptions, and expected conditions match the information provided in this document. The information presented within our study is based on limited information reviewed from online databases, geologic maps, and our historic investigations and experience in the vicinity of the project area. Should the size, intent, or other configuration of this project change, or new information become available, ANS Geo should be given the opportunity to update this document, as appropriate.

We sincerely appreciate the opportunity to support Ironwood Renewables with the Finch Solar project. Should you have any questions regarding our evaluation, please do not hesitate to contact me.

Yours Truly,



05/15/2025

Vatsal Shah, PE, Ph.D, PP, D.GE, F.NSPE
Principal Engineer
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o: (908) 754-8800 c: (908) 208-9362

Mario Colecchia, PE, SE
Structural Consultant

Exhibit N: Vegetation Management Plan

Vegetation Management Plan for

Finch Solar, LLC

Prepared May 2025 by:

Natural Resource Services

Contents

1. Finch Solar, LLC Vegetation Management Plan (VMP) Overview

1.1. Site Developer

Ironwood Renewables
910 Harding Street
LaFayette, LA 70503
337.889.394

1.2. Site Address

State Route 127
Hillsboro, Montogomery 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 Finch Solar project is a 5MW AC project planned for approximately 22 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. Two small wetlands have been delineated within the parcel boundary outside of the fenced areas. No vegetative screening or stormwater basins are planned at this time.

1.5. VMP Use and Objectives

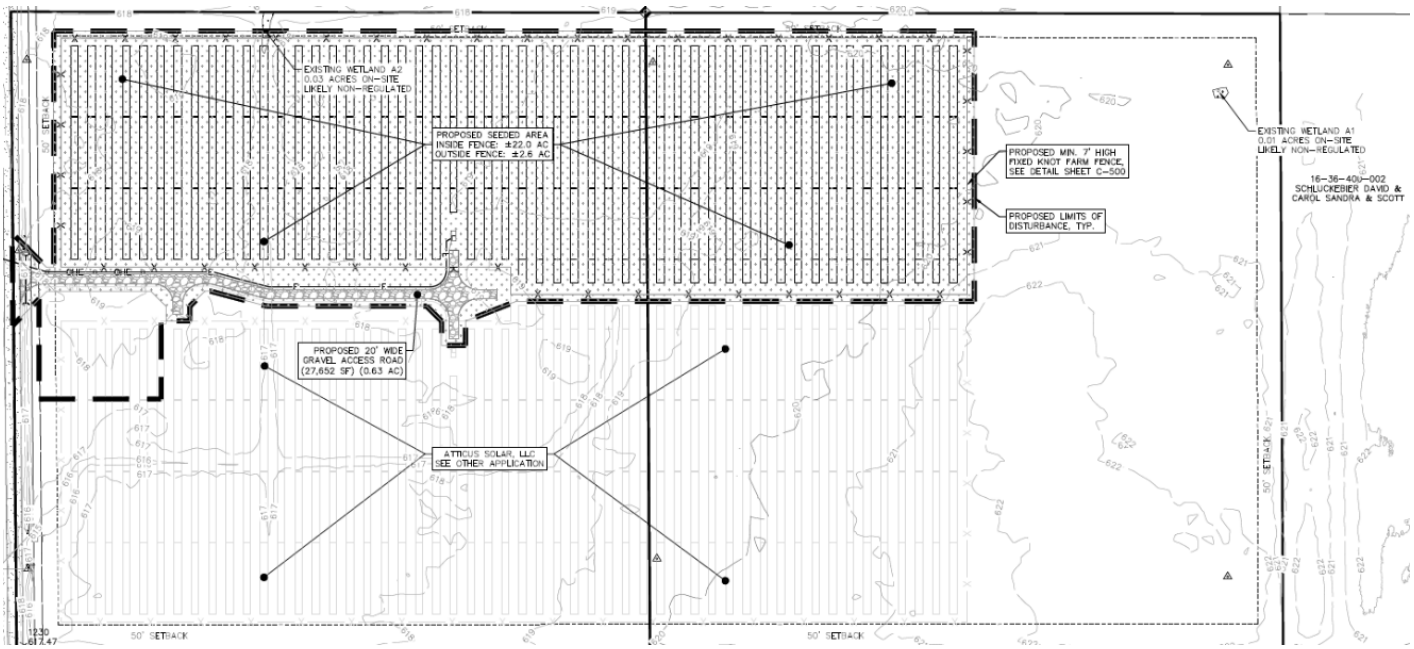
The VMP was written to provide a brief overview and description of the project and to act as a guide for vegetation installation and management. It has been custom-written based on information known at the time of writing. The VMP should be treated as a living document and adjusted as additional information 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 Finch 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 1125 E. Agricultural fields surround the Finch Solar project as well as a forest to the east of the site. The GPS coordinates for Finch Solar are 39.093105, -89.486741.

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 the aerial photos. A review of the soils on the USDA/NRCS Web Soil Survey shows moderately well drained and poorly drained soils, with about 79.7% of the site ecologically classified as Cowden-Piasa silt loams, 14% as Virden-Fosterburg silt loam, and 6.3% as Harrison 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 2nd 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

Finch 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 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

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: 107

Meets Preliminary Pollinator Standards - 85
Provides Exceptional Habitat - 110 and higher

Owner: Finch Solar, LLC
Vegetation Consultant: Natural Resource Services, Inc
Project Location: Hillsboro Township, IL
Project Size: 22 **acres**
Final Seeding Date: 2028

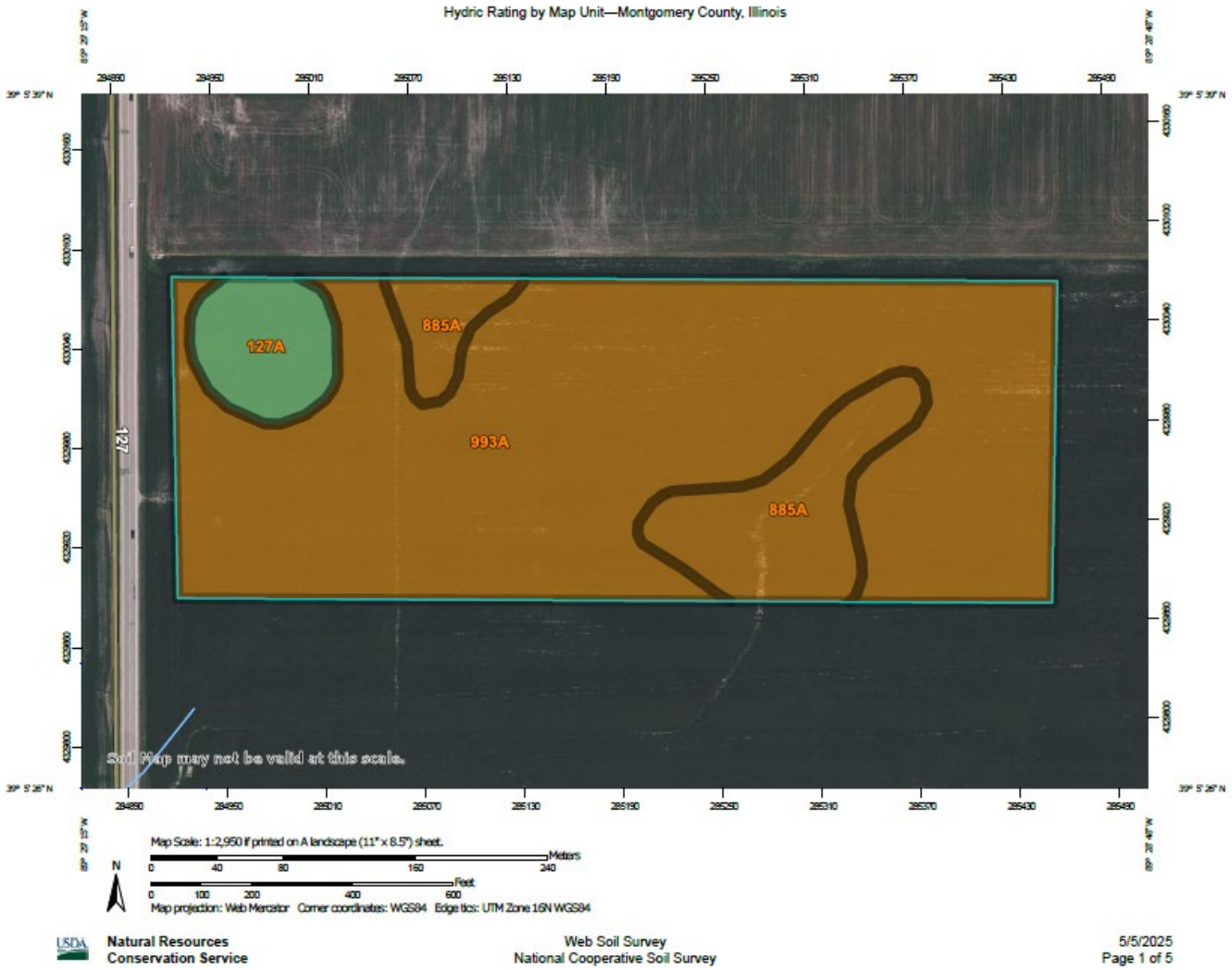
This form is designed (with the help of the Solar Site Pollinator Guidelines found on IDNR's website) to guide owners or managers of solar sites to meet the requirements to be able to claim a site is pollinator friendly according to the "Pollinator Friendly Solar Site Act (525 ILCS 55)". This form is 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

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Natural Resource Services

10. Soils Maps



Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
127A	Harrison silt loam, 0 to 2 percent slopes	10	1.6	6.3%
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	93	3.6	14.0%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	98	20.4	79.7%
Totals for Area of Interest			**25.6**	**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

Exhibit P: Roadway Coordination Correspondence

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: Finch 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 Finch Solar, LLC (collectively, the "Applicant"), intends to submit a Solar Farm Development Permit Application to Montgomery County for the proposed Finch 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 26.6 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 2027 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
Finch Solar, LLC

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: Finch 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 Finch Solar, LLC (collectively, the "Applicant"), intends to submit a Solar Farm Development Permit Application to Montgomery County for the proposed Finch 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 26.6 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 2027 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
Finch Solar, LLC

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

Finch Solar, LLC

State Route 127, Hillsboro, Montgomery County, Illinois 62049

Prepared by:
Ironwood Renewables, LLC
910 Harding St.
Lafayette, LA 70503

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	Finch Solar, LLC State Route 127, Hillsboro Montgomery County, Illinois 62049

2. SITE DESCRIPTION

2.1 Project Description

The 26.6-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), Virden-Fosterburg silt loams (885A), and Harrison silt loam (127A), all with 0–2% slopes. These soils are predominantly poorly drained, with 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

Finch 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.

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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

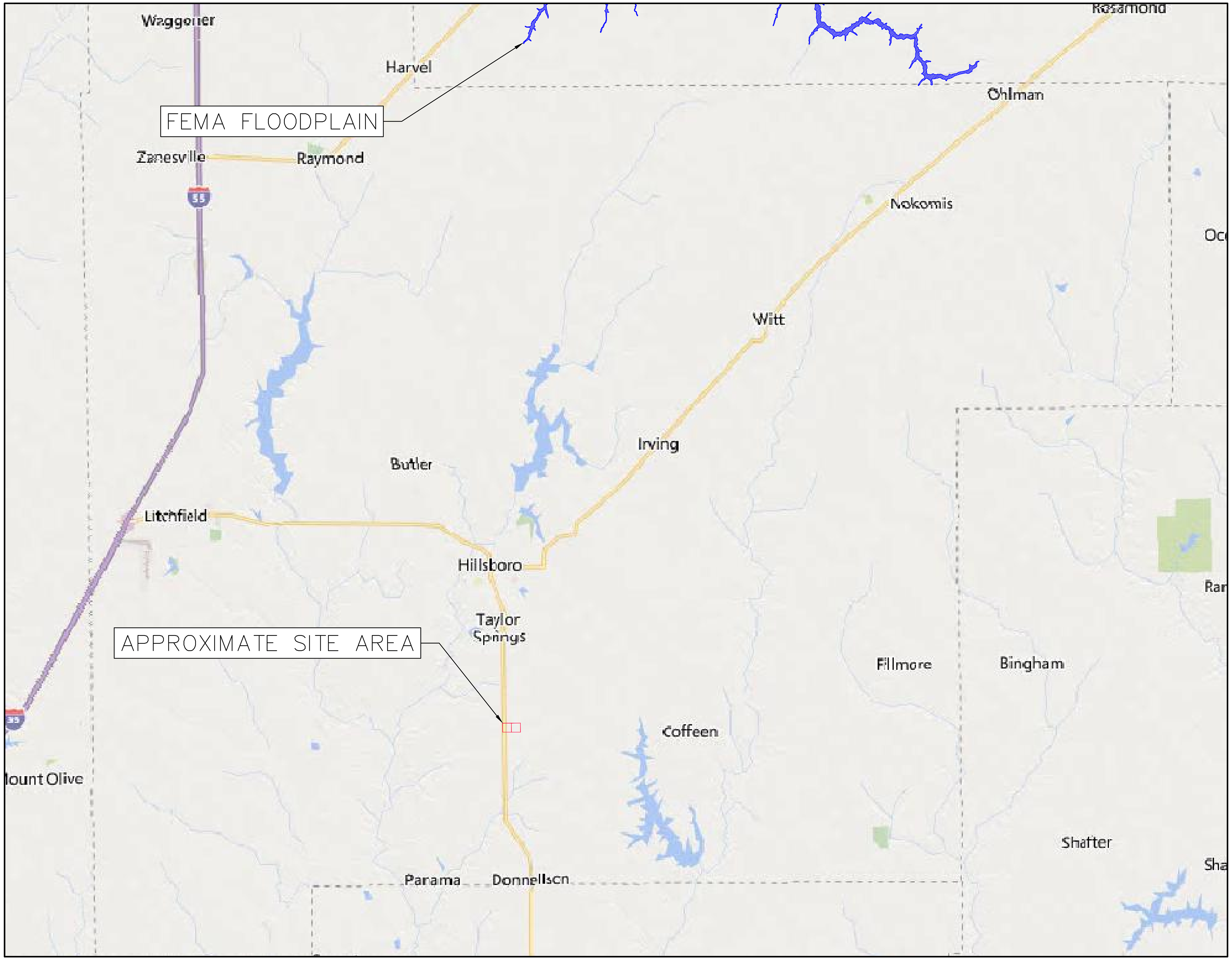
SCALE: 1"=150'

DR. NF	CH. BS
P.M. BS	
BOOK --	
JOB 24009016	
SHEET NO. 01	

CAD FILE: 24009016-WLM.DWG

G:\24000s\24009016\GIS\MXD\24009016-WLM.mxd 2/20/2025 3:37:14 PM NICHOLAS FERRERO

Attachment 5 – Location Map



LEGEND

APPROXIMATE SITE AREA (± 79.44 ACRES)

FEMA FLOODPLAIN

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

Know what's below. Call before you dig.

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248.447.2000

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

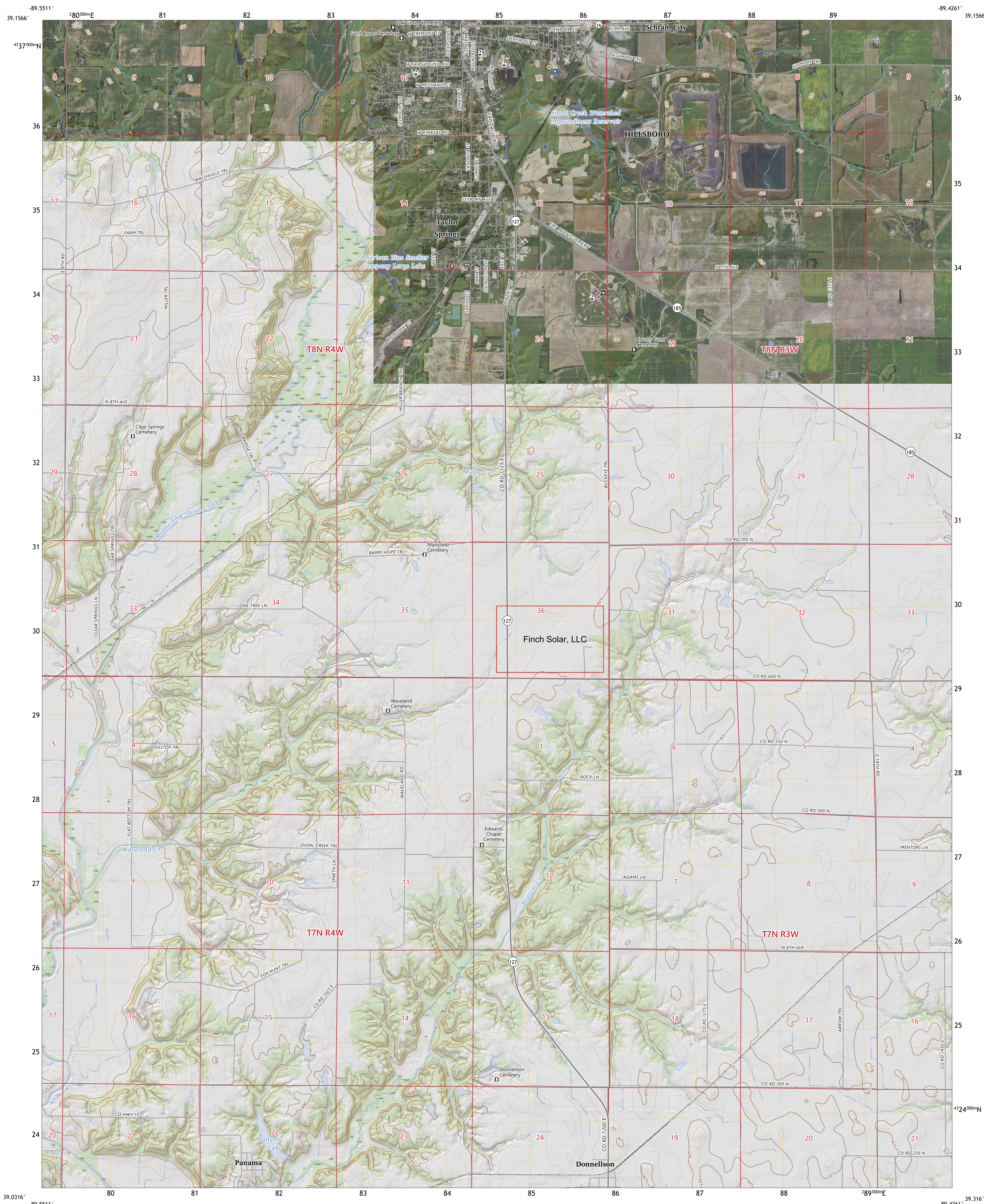
Attachment 6 – USGS Map

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map OnDemand Topo

7.5-MINUTE TOPO QUADRANGLE
ILLINOIS - CUSTOM EXTENT
7.5-MINUTE TOPO



-89.5511°
39.1566°
-89.4261°
39.1566°
Schram City
HILLSBORO
Taylor Springs
Oak Grove Cemetery
Saint Agnes Cemetery
Shoal Creek Watershed Impoundment Reservoir
American Zinc Smelter Company Large Lake
County Farm Cemetery
Clear Springs Cemetery
Mansfield Cemetery
Waveland Cemetery
Edwards Chapel Cemetery
Donnellson Cemetery
Middle Fork Shoal Creek
Miller Cr
Waveland Cr
Bearcat Cr
Panama Lake
Panama
Donnellson
Finch Solar, LLC
T8N R4W
T8N R3W
T7N R4W
T7N R3W
WALSHVILLE TRL
FARM TRL
E 8TH RD
MILLER TRL
N 8TH AVE
RED BRIDGE TRL
CLEAR SPRINGS TRL
CLEAR SPRINGS LN
LONE TREE LN
BARRY HOPE TRL
MILLER BRANCH TRL
BROADWAY ST
HILLTOP TRL
FLAT BOTTOM TRL
SHOAL CREEK TRL
SPAETH LN
WAVELAND RD
FOX HUNT TRL
CO RD 1025 E
CO HWY 10
CO RD 1125 E
BUCKEYE TRL
CO RD 700 N
CO RD 600 N
CO RD 550 N
E 14TH RD
ROCK LN
CO RD 500 N
MENTORS LN
ADAMS LN
N 4TH AVE
CO RD 1275 E
ARROW TRL
CO RD 1450 E
CO RD 300 N
CO RD 1200 E
CO RD 250 N
N 9TH AVE
CO RD 1375 E
185 MONTGOMERY
FILLMORE TRL
ASHMORE TRL
KLAR AVE
SCHOOL ST
E TREMONT ST
W TREMONT ST
W FAIRGROUND AVE
W MECHANIC ST
W KINKEAD RD
SEYMOUR AVE
JEFFERSON ST
S MAIN ST
ROUNTREE ST
HILLTOP DR
VANDALIA RD
VANDALIA ST
SUMMIT ST
SEYBORN AVE
OLD BUS LINE RD
WEST ST
PARK ST
LIVINGSTON ST
EAST ST
SPRING ST
ONDEY CT
39.0316°
-89.5511°
39.316°
-89.4261°

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

Data is provided by The National Map (TNM), is the best available at the time of map generation, and includes data content from supporting themes of Elevation, Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover, and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC) Metadata for additional source data information.

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. Temporal changes may have occurred since these data were collected and some data may no longer represent actual surface conditions.

Learn About The National Map: https://nationalmap.gov

MN GN
2½° 44 MILS
1°34′ 28 MILS
UTM GRID AND 2025 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000 - m Square ID
BJ
Grid Zone Designation
16S

SCALE 1:24 000

KILOMETERS 1 0.5 0 1 2
METERS 1000 500 0 1000 2000
MILES 1 0.5 0 1
FEET 1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
CONTOUR SMOOTHNESS = Medium

ILLINOIS

QUADRANGLE LOCATION

Butler	Hillsboro
Sorento North	Coffeen

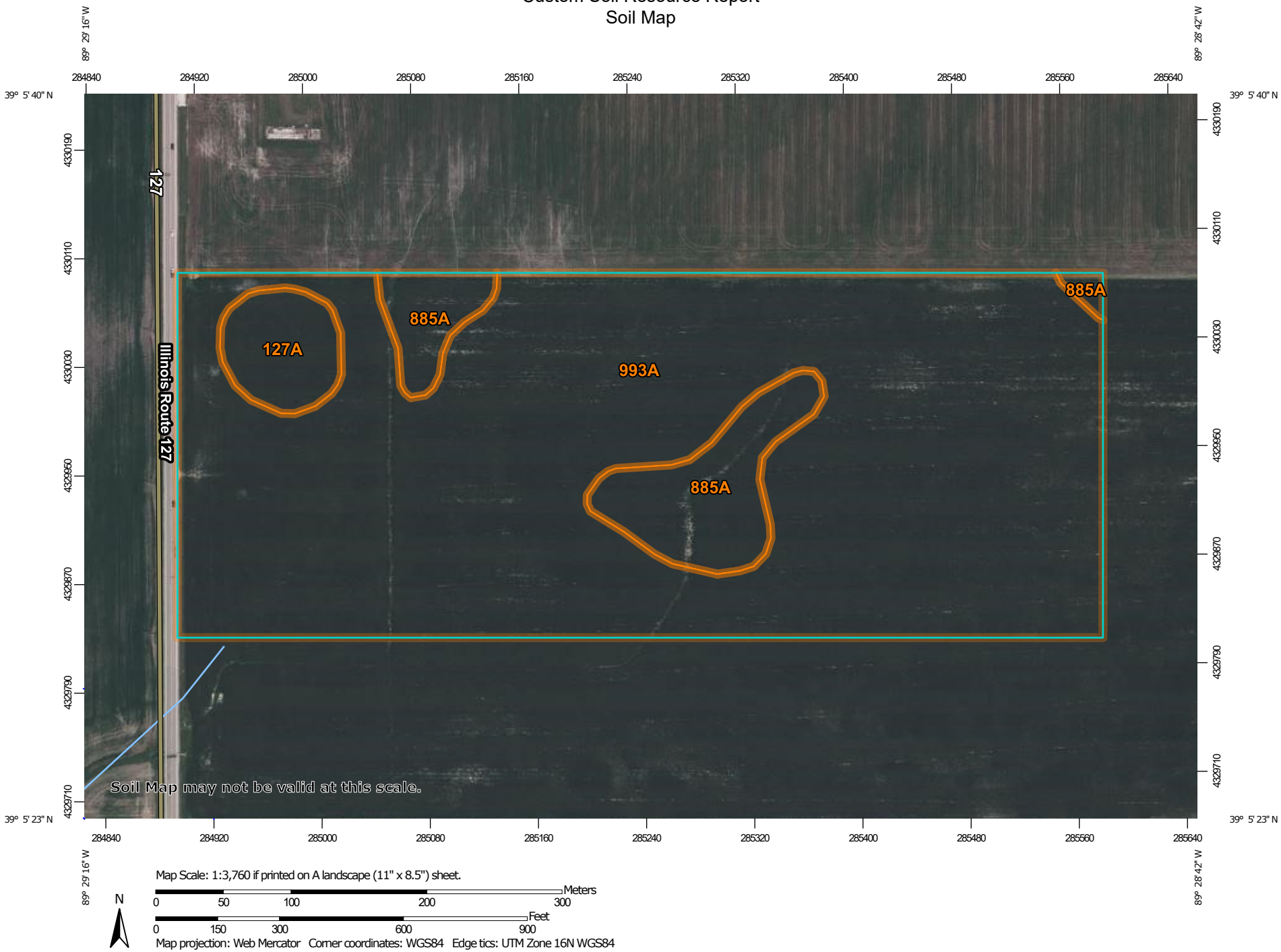
ADJOINING QUADRANGLES

ROAD CLASSIFICATION
Expressway — Local Connector
Secondary Hwy — Local Road
Ramp — 4WD
Interstate Route — US Route — State Route

7.5-MINUTE TOPO, IL
2025

Attachment 7 – NRCS Soil Report

Custom Soil Resource Report
Soil Map



Map Scale: 1:3,760 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

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
127A	Harrison silt loam, 0 to 2 percent slopes	1.7	3.6%
885A	Virden-Fosterburg silt loams, 0 to 2 percent slopes	4.2	9.3%
993A	Cowden-Piasa silt loams, 0 to 2 percent slopes	39.8	87.1%
Totals for Area of Interest		**45.6**	**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

127A—Harrison silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 316wr
Elevation: 340 to 1,200 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 190 to 225 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Harrison and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harrison

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over pedisediment over paleosol developed in till

Typical profile

Ap - 0 to 15 inches: silt loam
Bt1 - 15 to 45 inches: silty clay loam
2Bt2 - 45 to 67 inches: silty clay loam
3Btg - 67 to 79 inches: clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
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 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: R108XB005IL - Loess Upland Prairie
Hydric soil rating: No

Minor Components

Virden

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

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

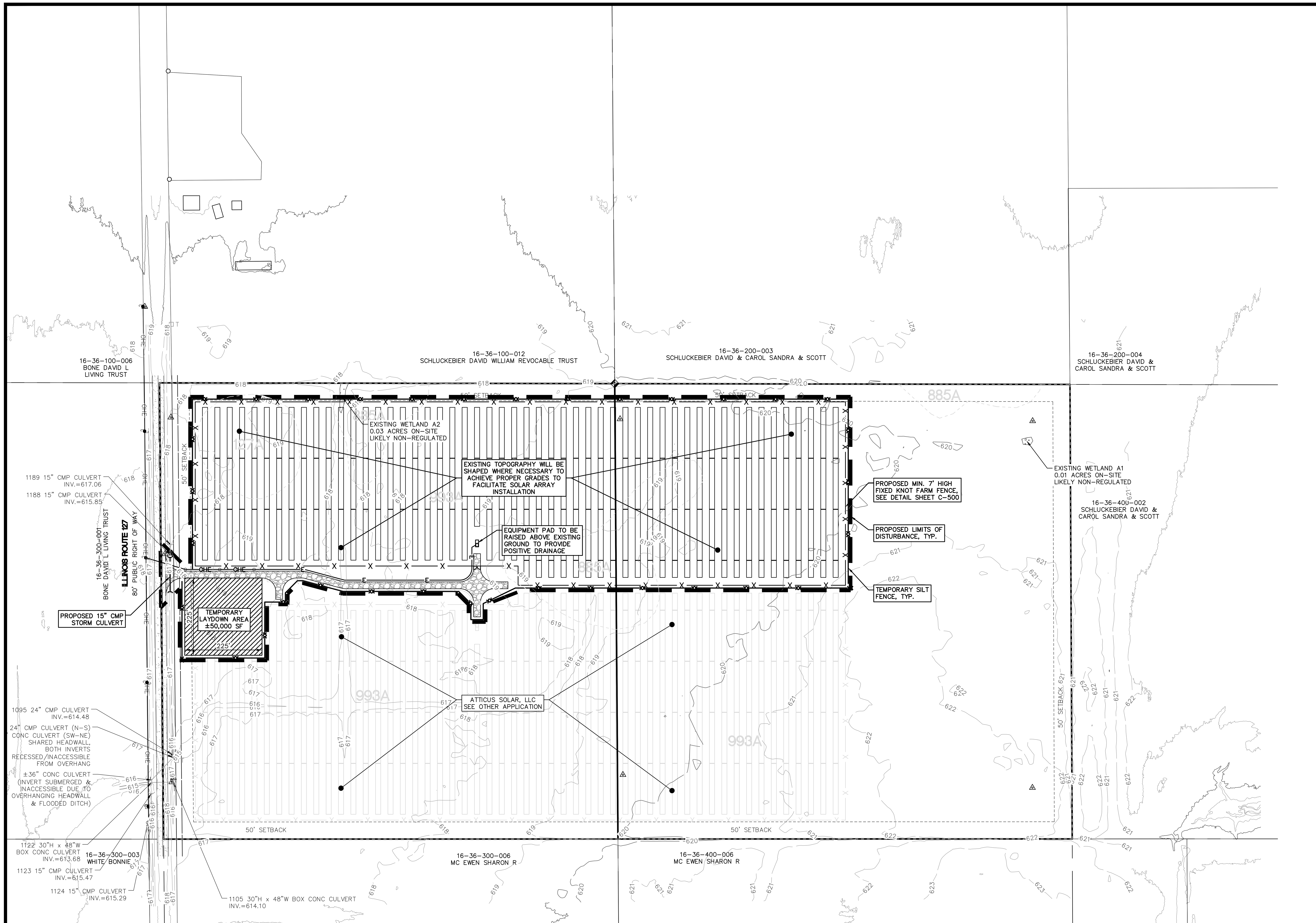
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

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



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.

S:\24009016\DWG\PLAN SETS\SITE-PRELIMINARY\1 - FINCH SOLAR\24009016C-300-G-1.DWG C-300 GRADING PLAN 5/12/2025 12:58 PM CAITLYN PREAST

LEGEND

- BOUNDARY LINE
- EXISTING ROW
- BOUNDARY ADJACENT LINE
- SECTION LINE
- EXISTING EASEMENT LINE
- EXISTING CONTOUR (680 / 679)
- PROPOSED CONTOUR (680 / 679)
- 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: ± 26.6 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	86

- 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	0.01
C	PASTURE; GOOD	74	1.64
C/D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	1.50
C/D	PASTURE; GOOD	80	3.06
D	ROW CROPS; STRAIGHT ROW (SR) GOOD	89	52.13
D	PASTURE; GOOD	80	21.20
–	EXISTING IMPERVIOUS AREA	98	0.44
–	PROPOSED IMPERVIOUS AREA	98	0.64
		COMBINED CN= 86	80.63

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

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

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

NOT FOR CONSTRUCTION

DATE MAY 12, 2025
REVISIONS

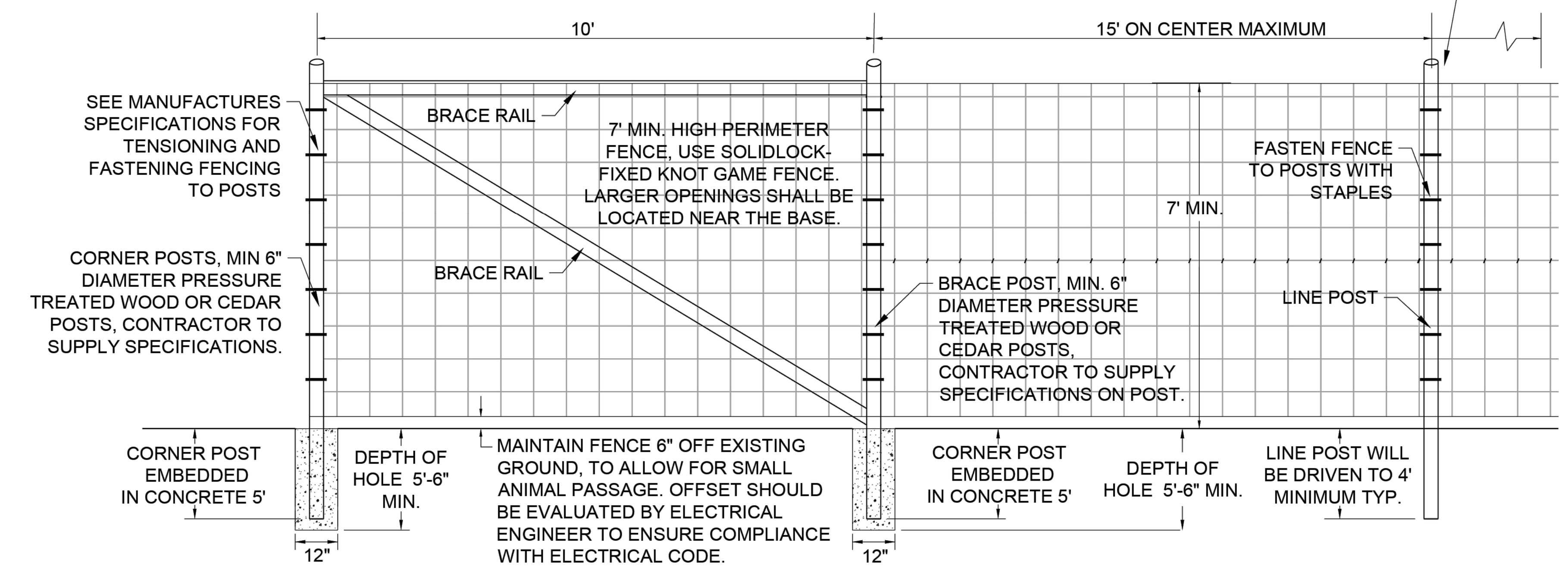
SCALE 0 75 150
1" = 150 FEET

DR. C.M.P. CH. M.S.
P.M. M. KEITH
JOB 24009016
SHEET NO. C-300

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.

LINE POSTS 15' ON CENTER MAXIMUM. LINE POSTS SHALL BE MIN. 4" DIAMETER PRESSURE TREATED WOOD OR CEDAR POST CONSTRUCTED IN SIMILAR FASHION AS CORNER POSTS ON THIS DETAIL.

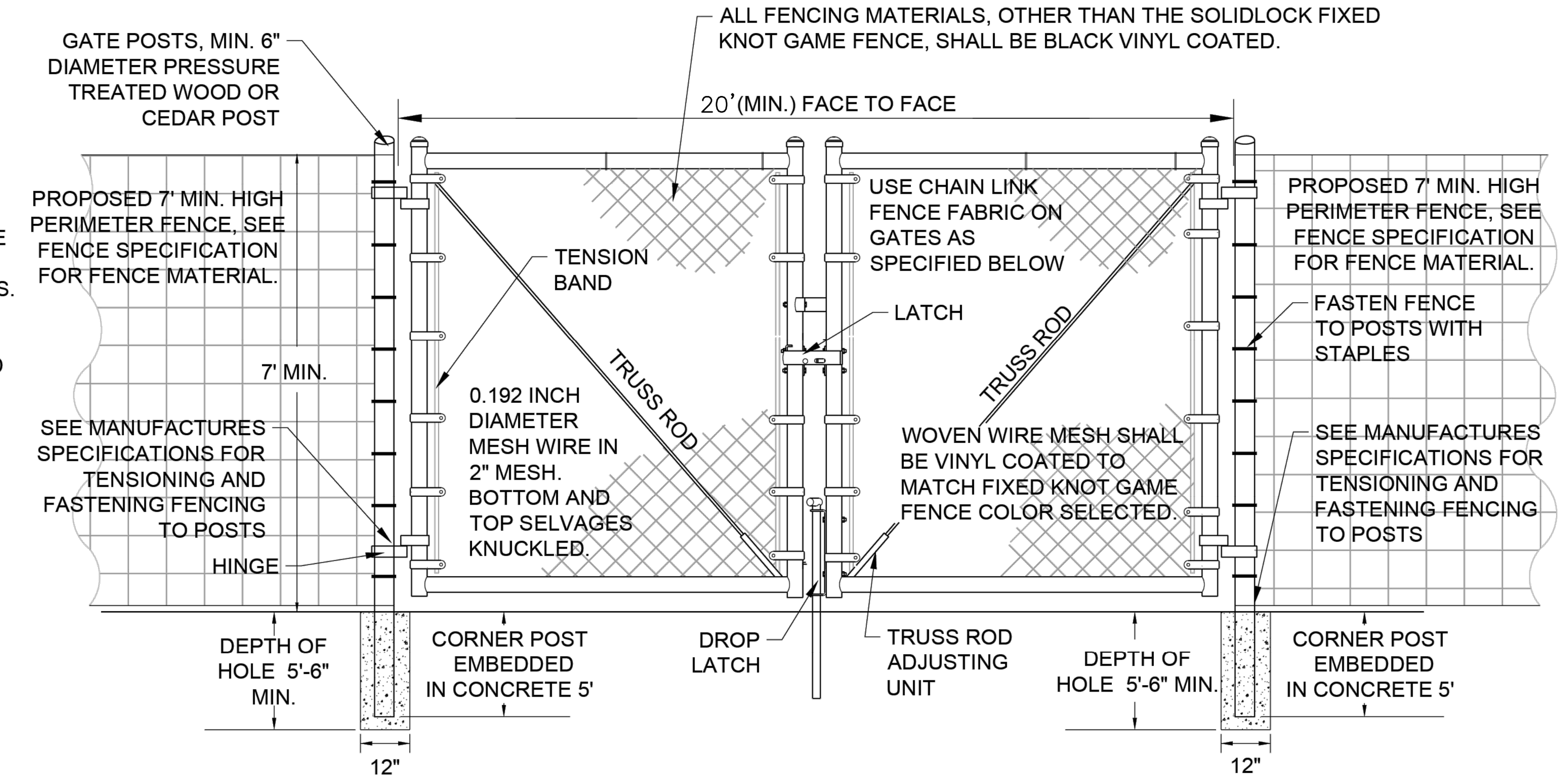


TYPICAL FIXED KNOT GAME FENCE

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.

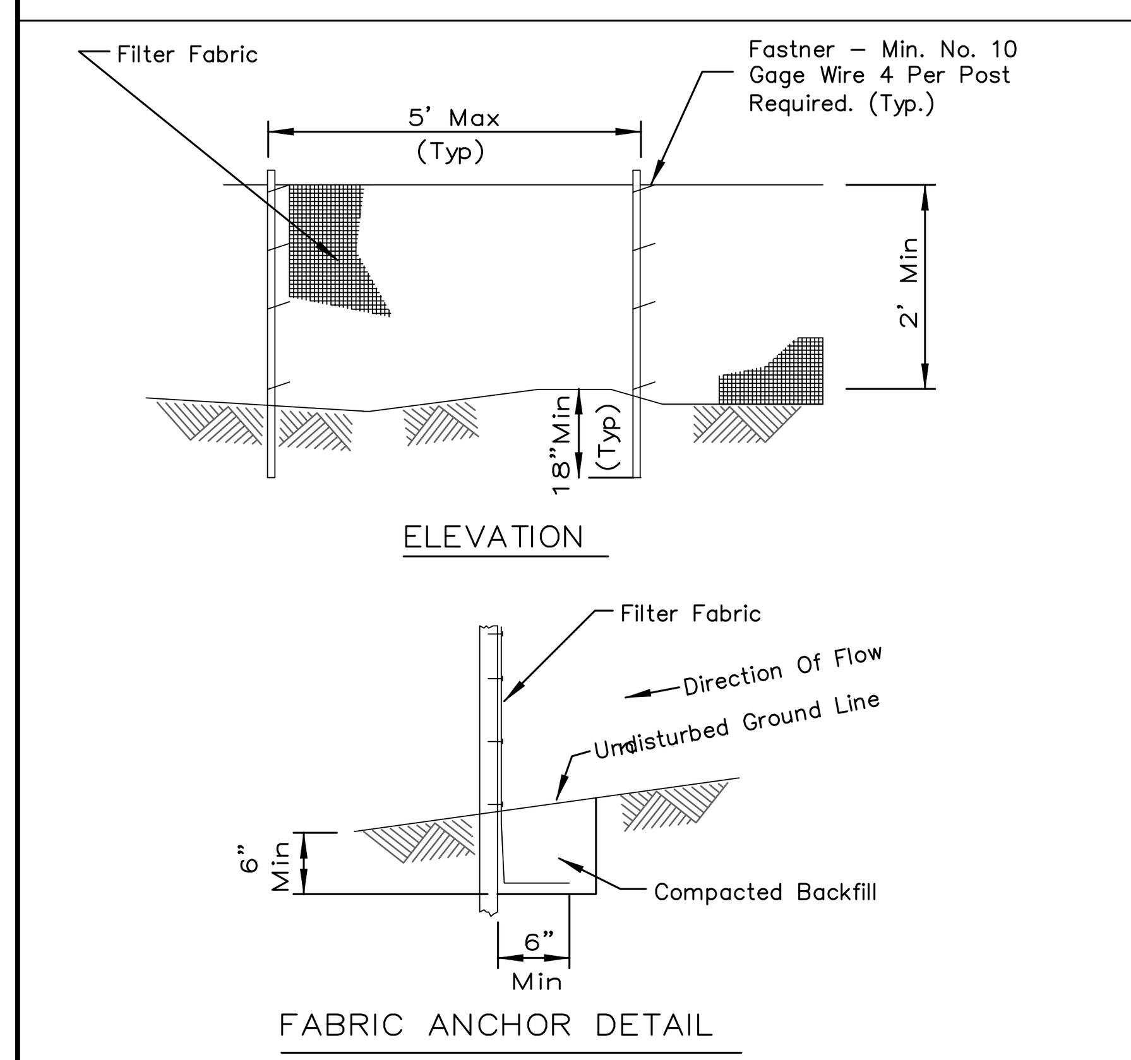
NOTES
1. PAINT ALL GALVANIZED PIPE AND FITTINGS TO MATCH SOLIDLOCK FIXED KNOT GAME FENCE. PAINT SHALL BE SUITABLE FOR USE ON GALVANIZED SURFACES.
2. EMERGENCY CONTACT SIGN SHALL BE PLACED ON THE GATE, WHICH IDENTIFIES THE PROJECT OWNER AND PROVIDES A 24-HOUR EMERGENCY CONTACT PHONE NUMBER.



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 at 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 3–16–2012
Approved ______	Date ______		

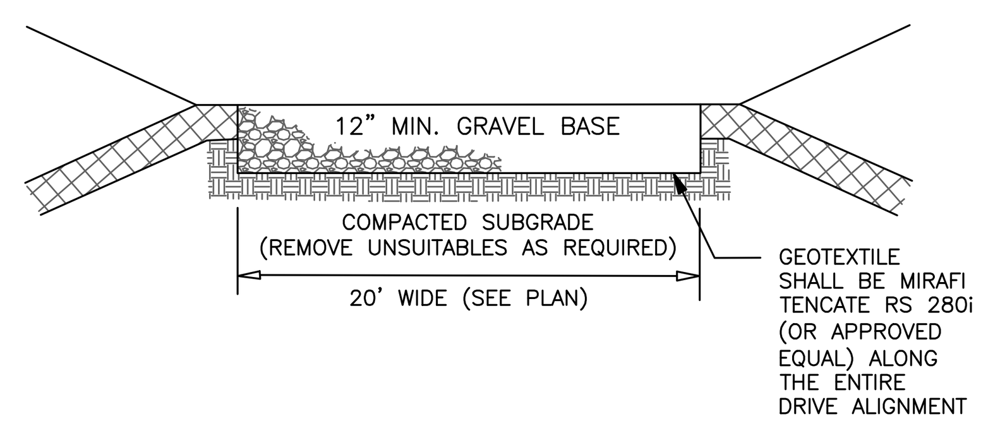
MAINTENANCE:

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.

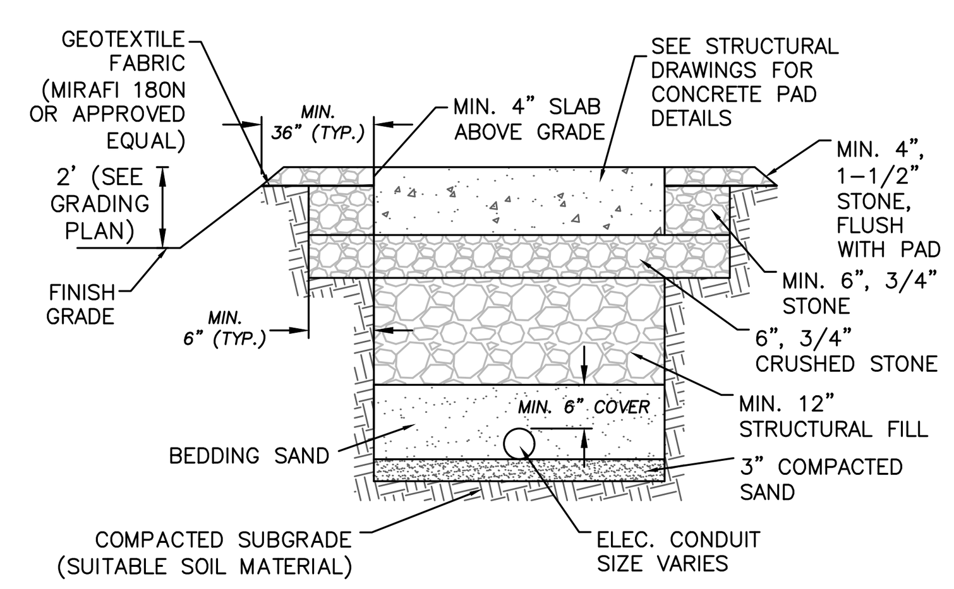
ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, A SEEDBED PREPARED AND THE SITE VEGETATED.



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.

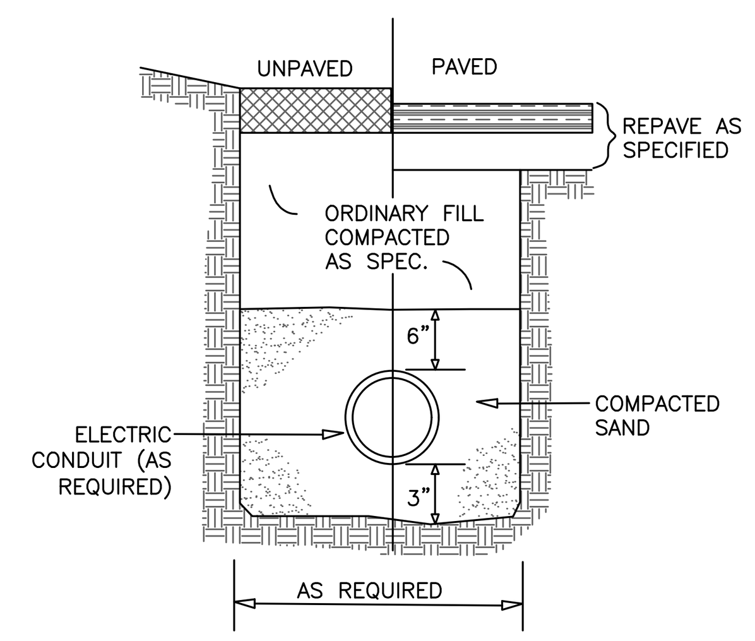
ACCESS DRIVE CROSS SECTION

NOT TO SCALE



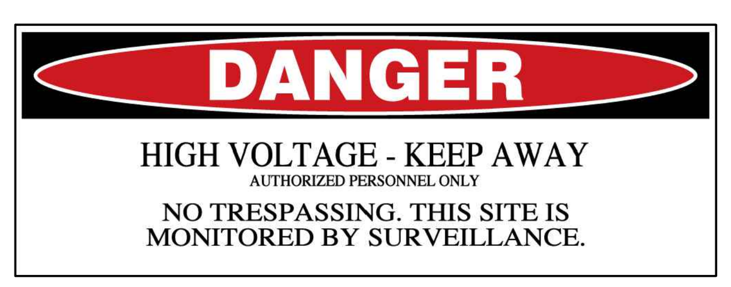
EQUIPMENT FOUNDATION DETAIL

NOT TO SCALE



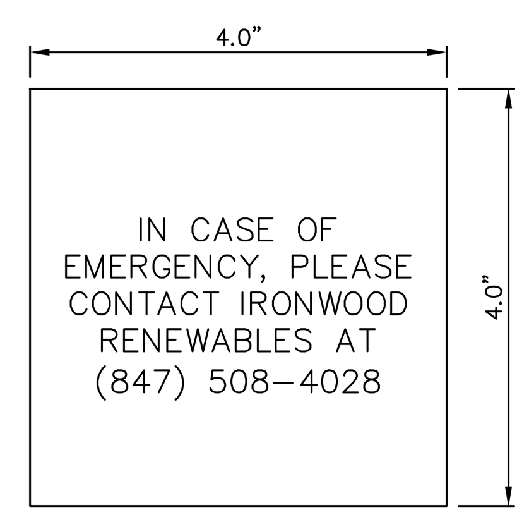
ELECTRIC CONDUIT TRENCH

NOT TO SCALE



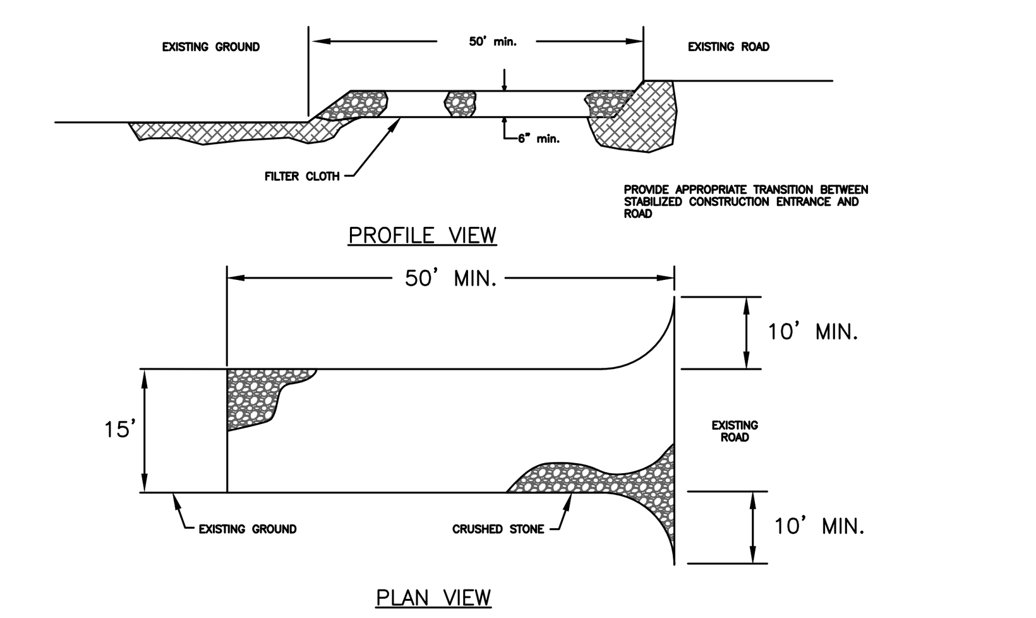
TYPICAL "DANGER" WARNING SIGN

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 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

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ATTRIBUTE
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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	

Attachment 9 – BMP Installation Log

BMP INSTALLATION LOG

Project: Finch 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: Finch Solar, LLC

Location: State Route 127 Hillsboro, Montgomery County, IL 62049

Amendment No.	Date	Description of Amendment