

CASE INFORMATION

CASE NO.: 26-42-S **PETITIONER:** Mackinaw Solar LLC

AGENT OR REPRESENTATIVE: kate.duncan@quarles.com Kate Duncan, Attorney – Quarles
smarch@doral-llc.com Stanci March, Senior Manager of Development – Doral
cpekar@doral-llc.com Chrisopher Pekar, Director of Development – Doral
info@mackinawsolarproject.com Rashelle Cupi, Local Representative

ADDRESS: Two Logan Sq, Ste. 1830, Philadelphia, PA 19103 **PHONE:** 445-447-9200 (Stanci March)

REQUEST FOR: Mackinaw Solar, LLC (www.mackinawsolarproject.com) requesting a Special Use to allow for the construction of a 500 Mega Watt, approximate 3,400 +/- acre, Utility Scale Solar Energy Facility located in A-1 Agriculture Preservation Districts, CONS Conservation Districts and I-1 Heavy Industrial Districts

P.I.N.#'s 08-09-24-300-004; 08-09-24-400-004; 08-09-24-400-008; 08-09-25-100-002; 08-09-25-400-004; 08-09-36-200-001; 08-09-36-200-010; 08-09-36-300-001; 08-15-01-100-001; 08-15-02-100-003; 08-15-02-200-001; 08-15-02-300-005; 08-15-03-100-001; 08-15-03-300-001; 08-15-03-300-002; 08-15-03-400-004; 08-15-03-400-005; 08-15-04-100-002; 08-15-04-200-002; 08-15-04-300-001; 08-15-04-400-001; 08-15-04-400-006; 08-15-04-400-008; 08-15-04-400-010; 08-15-09-100-004; 08-15-09-200-004; 08-15-09-200-009; 08-15-09-200-016; 08-15-09-400-012; 08-15-09-400-013; 08-15-10-100-002; 08-15-10-100-003; 08-15-10-200-006; 08-15-10-300-002; 08-15-10-300-008; 10-10-08-400-003; 10-10-17-100-007; 10-10-17-200-002; 10-10-17-300-001; 10-10-17-300-013; 10-10-17-400-003; 10-10-19-200-015; 10-10-19-300-003; 10-10-19-400-013; 10-10-20-100-001; 10-10-20-200-008; 10-10-20-300-005; 10-10-20-400-001; 10-10-21-100-001; 10-10-21-100-002; 10-10-21-200-001; 10-10-21-300-001; 10-10-21-400-001; 10-10-28-100-001; 10-10-28-300-001; 10-10-28-400-001; 10-10-29-200-001; 10-10-29-300-003; 10-10-29-400-001; 10-10-29-400-002 **PARCEL SIZE** 3,400 +/- acres **PRESENT ZONING:** A-1, I-1, Cons

SURROUNDING ZONING: **N** A-1, R-1, I-1, I-2, Cons **S** A-1, R-1, I-1, I-2, Cons
E A-1, R-1, I-1, I-2, Cons **W** A-1, I-1, I-2, Cons

PETITION RECEIVED: 8/21/2026 **CASE ORIGIN:** By Petitioner

AGENCIES NOTIFIED AND COMMENTS MADE:

PLANNER: Notified 9/3/2026

HEALTH DEPT.: Notified 9/3/2026

TCSWCD: Notified 9/3/2026

TCFB: Notified 9/3/2026

COUNTY HIGHWAY: Notified 9/3/2026

COUNTY EMA: Notified 9/3/2026

MUNICIPALITY: Notified 9/3/2026 Pekin, South Pekin & Manito

TOWNSHIP: Notified 9/3/2026 Cincinnati & Spring Lake

IDOT: Notified 9/3/2026

SURROUNDING PROPERTY OWNERS: Notified 9/2/2026

PUBLICATION DATE: 9/2/2026 **WHERE:** Peoria Journal Star

ACTION TAKEN:

ZONING BOARD OF APPEALS: **DECISION:**

LAND USE COMMITTEE: **DECISION:**

COUNTY BOARD: **DECISION:**

**TAZEWELL COUNTY COMMUNITY
DEVELOPMENT
APPLICATION FOR ZONING HEARING**

PETITION FOR:

- ☐ Special Use (New Dwelling Site)
☒ Special Use (Other)

Staff Use Only: Accepted by: MK
Date Filed: 8/21/26 **CASE NO.** 26-42-S
Filing Fee: \$125,000 Publication Fee: _____
ZBA Hearing Date: 10/6/2026
Decision Date: _____
☐ APPROVED ☐ DENIED ☐ OTHER _____

1. Applicant and Owner Information:

Applicant:

Name: Mackinaw Solar LLC
Address: Two Logan Square, Suite #1830
City, State: Philadelphia, Pennsylvania
Phone: 445-447-9200
(daytime contact)
Email: smarch@doral-llc.com

Owner:

Name: See list of landowners attached in narrative
Address: _____
City, State: _____
Phone: _____
(daytime contact)
Email: _____

The property interest of the applicant, if not the owner: Leaseholder/Easement Holder/Authorized Applicant

2. Site and Surrounding Property Information:

- a. 911 Address or property location of subject property: Provided in the Attached Narrative
- b. Correct Legal Description and Property Identification Number: (Attach an additional sheet if necessary - a copy of the legal description may be obtained from the Recorder of Deeds Office – 1st floor, McKenzie Building)
Current Zoning: See attached narrative Property ID Number: Provided in the attached narrative
Proposed Parcel Size/Acreage: ~3,400 Acres Soil Productivity Rate of Western Panel Array: 91 SPI
Site: Legal Description: Eastern Panel Array: 107 SPI
Provided in attached narrative
- c. Describe all existing structures, physical attributes and current land use of the property:
Existing structures and conditions include participating and non-participating residences, occupied community buildings, parcel boundary lines including identification of adjoining properties, setback lines, public access roads and turnout locations, and the location of any wetlands. The present land use includes commercial row-crop agriculture. For more information, please see attached narrative.
- d. Previous Special Use/Variance requests for this property? ☒ No ☐ Yes—Case No. _____

3. State the Reason For and Nature of the Special Use:

Applicant requests the Special Use Permit for a Commercial Solar Energy System.

- a. Hours of operation: 24 hours 7 days per week Number of employees: See attached narrative
- b. Number of parking spaces: N/A Handicapped: N/A Parking Lot Surface: N/A
- c. Signs (size and number of): See attached narrative
- d. Number of new buildings to be constructed and proposed use of each building:
Solar Panels and related infrastructure. See attached narrative for additional details.
- e. Future expansion and time schedule: See attached narrative.

4. **New Dwelling Sites Only:** A **livestock feeding operation** is defined by the Tazewell County Zoning Code as: Any new or existing operation which stables or confines and feeds or maintains for a total of 45 days or more in any 12-month period a combination of at least fifty (50) animal units, or its equivalency. *(Contact the Tazewell County Farm Bureau Office at (309) 347-3165 for assistance if you are uncertain regarding location of active livestock feeding operations.)

- a. Is the property located: (Check appropriate item) **Not applicable. No new dwellings proposed**
1. Less than one-half (½) mile of a **livestock feeding operation**: ☐ Yes ☐ No
- *If less than ½ mile is a Variance necessary? ☐ Yes ☐ No
2. More than one-half (½) mile of a **livestock feeding operation**: ☐ Yes ☐ No
- b. Type of livestock operation _____ Number of animal units: _____

5. **The Zoning Board of Appeals makes a Finding of Fact for all Special Use. Please provide how your application conforms to the following: (attached an additional sheet if necessary)**

- a. The site will be so situated as to minimize adverse effects, including visual impacts on adjacent properties.
See attached narrative.

- b. The establishment, maintenance or operation of the Special Use will not be detrimental to or endanger the public health, safety, morals, comfort or general welfare of the neighboring vicinity.
See attached narrative.

- c. The Special Use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted.
See attached narrative.

- d. The Special Use will not substantially diminish and impair property value within the neighborhood.
See attached narrative.

- e. Adequate utilities, access roads, drainage and other necessary facilities have been or are being provided.
See attached narrative.

- f. Adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion and hazard on the public streets.
See attached narrative.

- g. Granting the special use, ***which is located one-half mile or less*** from a livestock feeding operation, will not increase the population density around the livestock feeding operation to such levels that would hinder the operation or expansion of such operation or granting the special use, which is located ***more than one half mile*** from a livestock feeding operation will not hinder the operation or expansion of such operation.
See attached narrative.

- h. The Special Use is consistent with the existing uses of property within the general area of the property in question.
See attached narrative.

- i. The property is suitable for the Special Use as proposed.
See attached narrative.
-

6. **Signature:** I (we) certify that the proposed Special Use will conform to the standards for Special Uses in the Tazewell County Zoning Ordinance and hereby acknowledges that all the information contained in this application and accompanying documents are true and correct to the best of my (our) knowledge.

Stanimir March

Applicant Signature

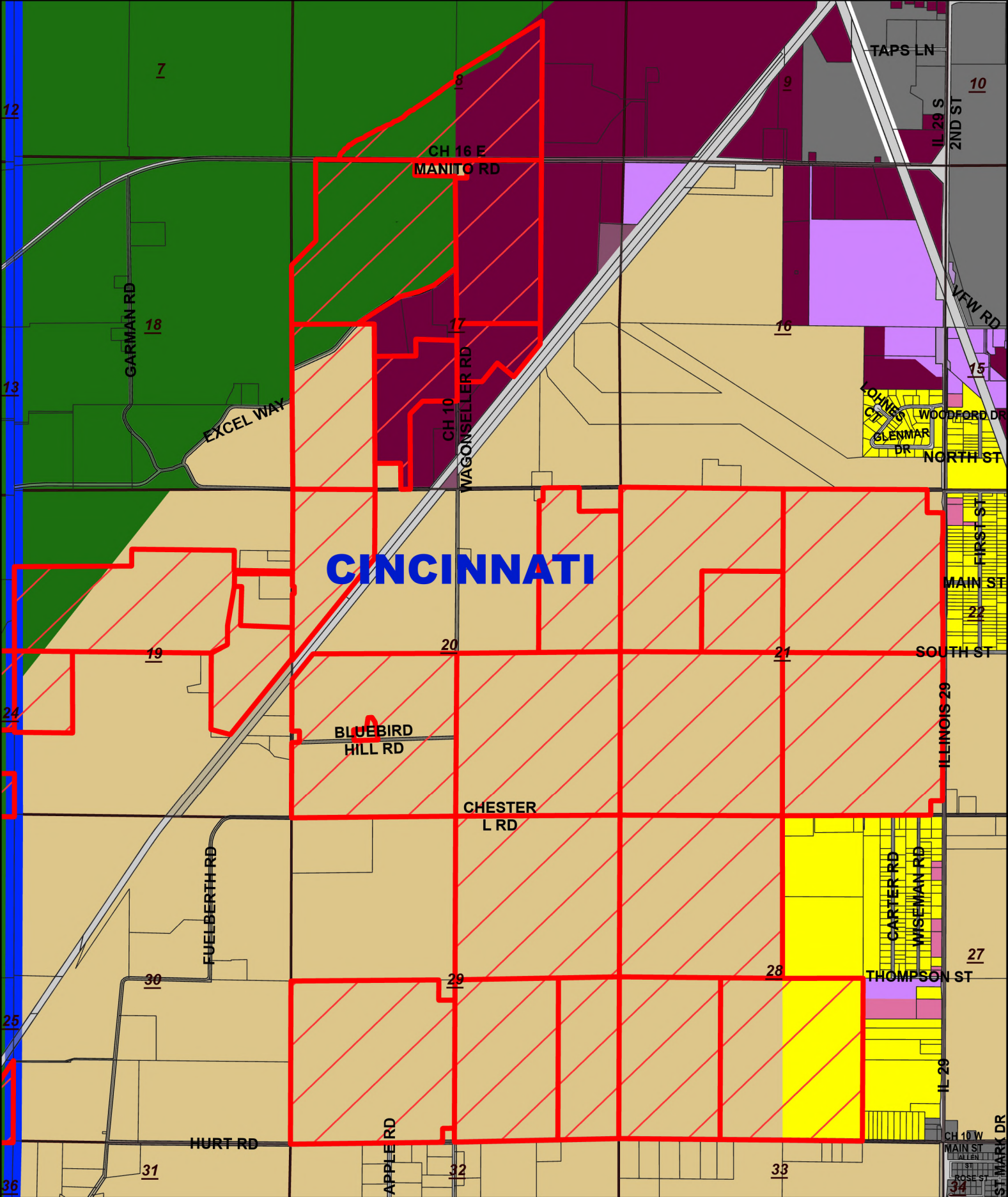
08/19/2026

Date

Please see attached owner consent forms

Owner Signature

Date



CINCINNATI



Zoning

District

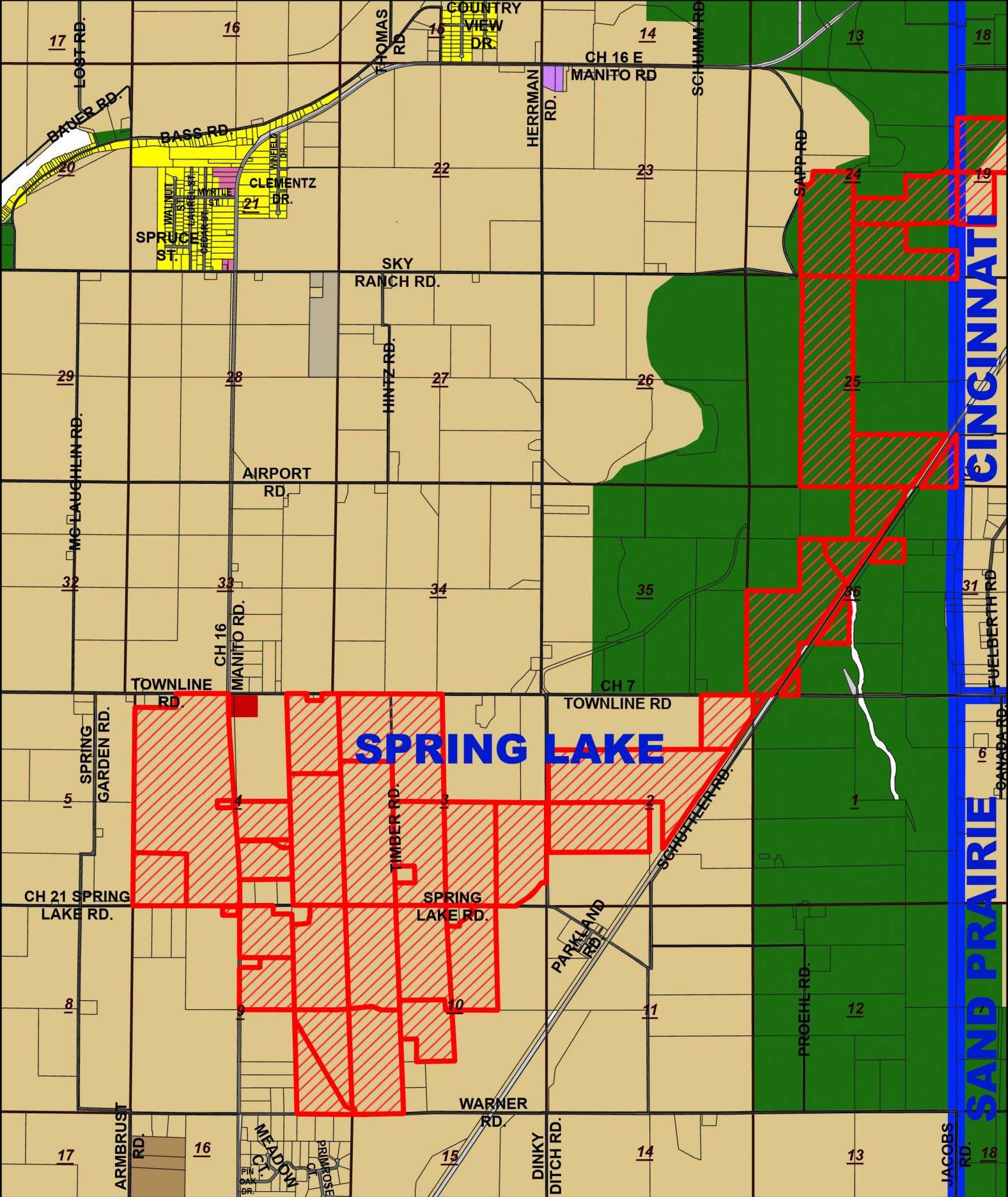
AG Area

A-1
A-2
C-1

C-2
CITY
CONS

EXHIBIT

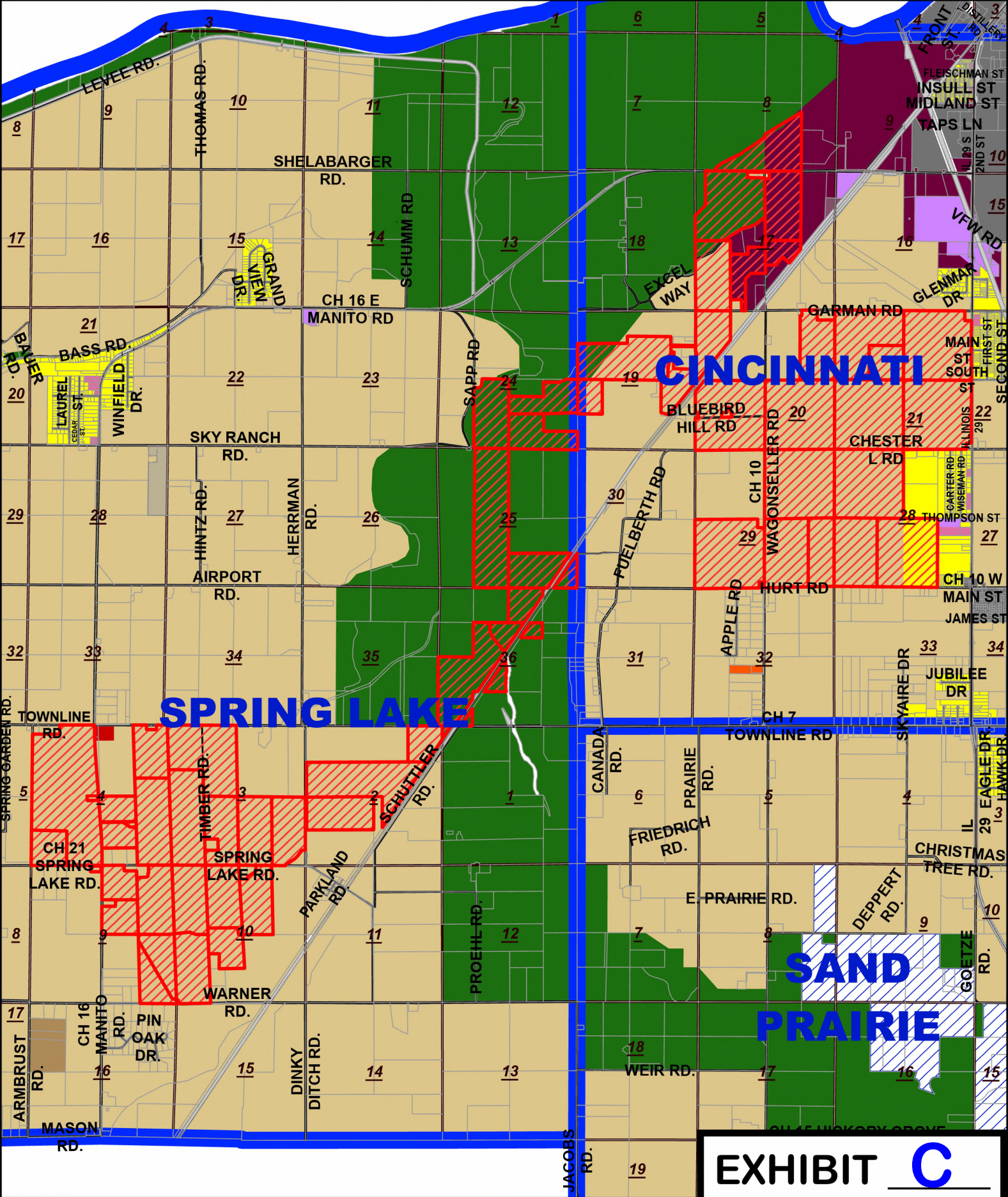
A



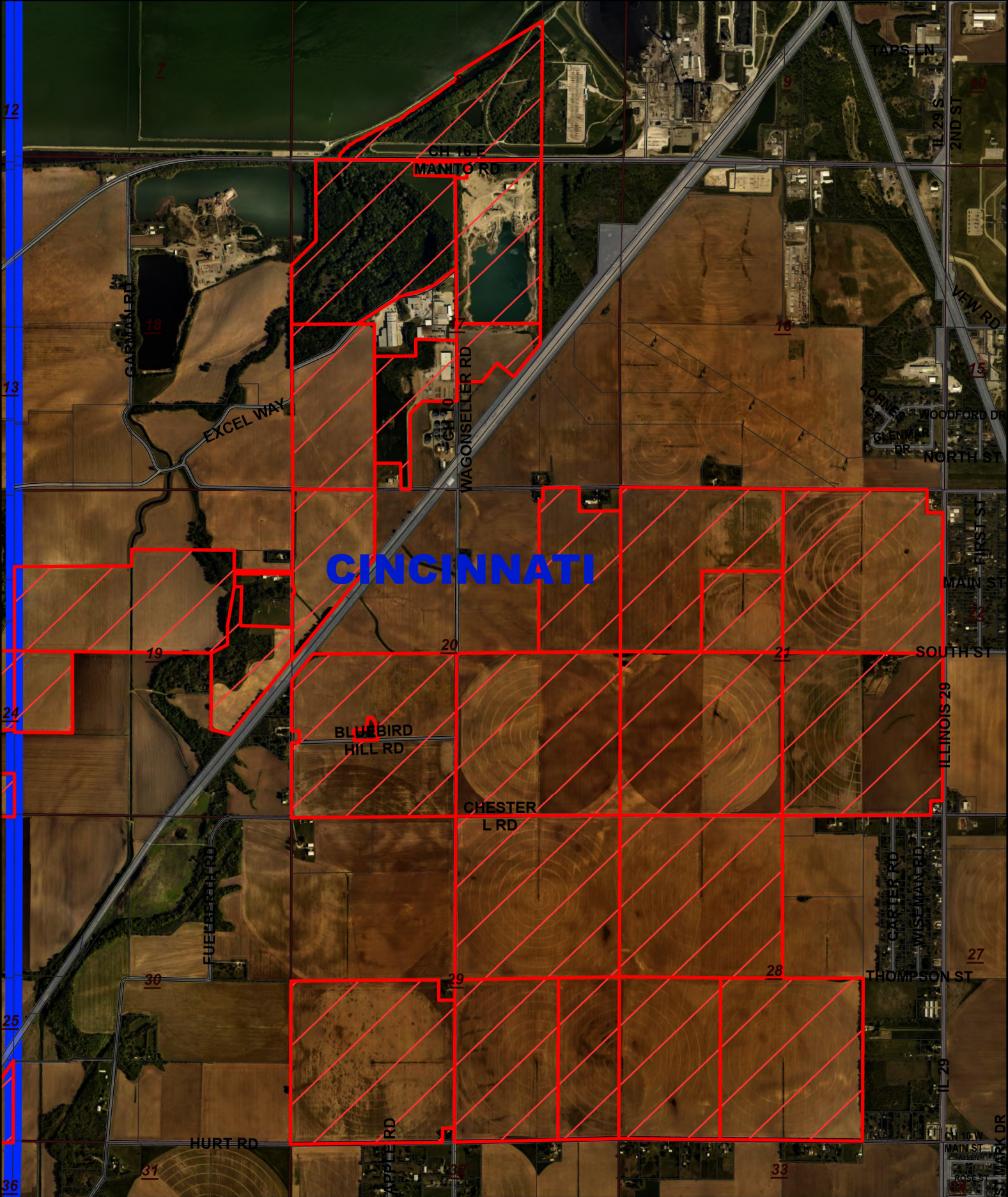
Zoning	A-1	C-2
District	A-2	CITY
	C-1	CONS
AG Area		

EXHIBIT

B



Zoning		A-1	C-2	I-1	R-2
District		A-2	CITY	I-2	R-R
		C-1	CONS	R-1	
AG Area					



CINCINNATI



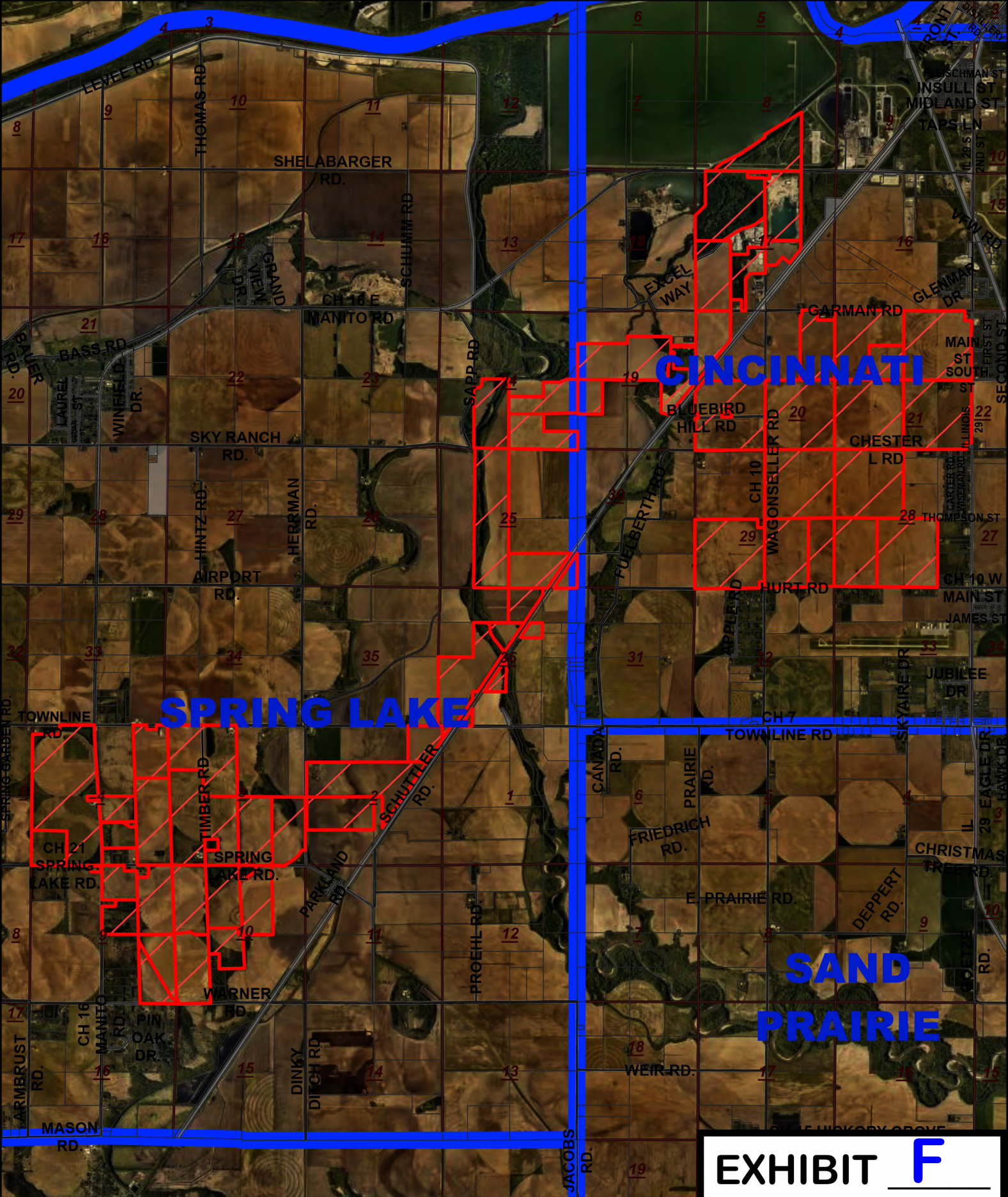


EXHIBIT **F**

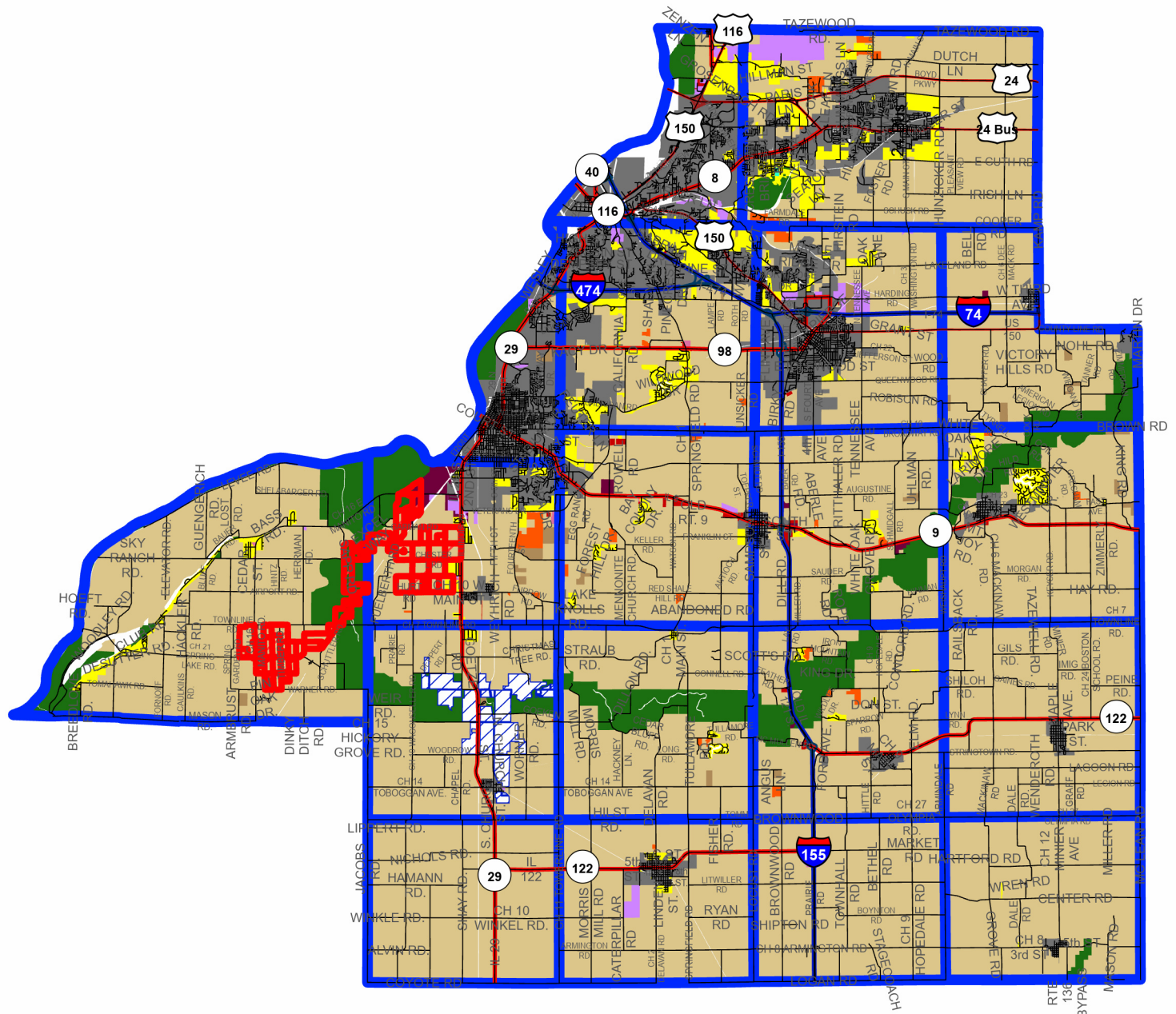


EXHIBIT G

Zoning

District

 AG Area

 A-1

 A-2

 C-1

 C-2

 CITY

 CONS

 I-1

 I-2

 R-1

 R-2

 R-R





Special Use Permit Application

Mackinaw Solar Project

Mackinaw Solar LLC

Tazewell County, Illinois

August 2026

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	SECTION 157.437 SPECIAL USE APPLICATION REQUIREMENTS.....	2
2.1	Applicant Information	2
2.2	Property Owner Information and Legal Descriptions	3
2.3	Project Location and Description of Proposed Use	3
2.4	Present and Proposed Land Use	5
2.5	Surrounding Zoning Classifications	5
2.6	Explanation for Need for Special Use at the Proposed Site	5
2.7	Site Plan	5
2.8	Copy of Site Plan	5
2.9	Statement from Road Official	6
3.0	Sec. 153.04(C) ADDITIONAL APPLICATION DOCUMENTS	6
3.1	Agricultural Impact Mitigation Agreement	6
3.2	Interconnection Proof	6
3.3	Protected Species / EcoCAT / USFWS IPaC	6
3.4	Protected Lands	7
3.5	Illinois State Historic Preservation Office	7
3.6	Compliance with FAA	7
4.0	Sec. 153.05 DESIGN AND INSTALLATION	8
4.1	Code Compliance	8
4.2	Temporary Site Posting	9
4.3	Lighting	9
4.4	Parcel Identification Number	9
4.5	Roads.....	10
4.6	Noise Levels	11
4.7	Farmland Drainage Plan and Tile Repair	11
4.8	Waste.....	11
4.9	Setbacks	11
4.10	Height	12
4.11	Fence	12
4.12	Screening	12
4.13	Vegetation and Agrivoltaics	12
5.0	Sec. 153.06 OPERATIOIN AND MAINTENANCE	14
5.1	Facility Owner.....	14
5.2	Permanent Address Posting.....	14
5.3	Operation and Maintenance Contact	14
5.4	Annual Report.....	14
6.0	Sec. 153.09 LIABILITY INSURANCE.....	15
7.0	Sec. 153.10 DECOMMISSIONING PLAN	15
8.0	Sec. 153.11 EMERGENCY RESPONSE PLAN	15

9.0	SUPPLEMENTAL MATERIALS	16
9.1	Visual Simulations	16
9.2	Glare	16
9.3	Property Value Assessment	16
9.4	Economic Benefits	17
9.5	Avoided Pollution and Public Health, Ecosystem, and Economic Impact Report	17
9.6	Stormwater Management Report	18
10.0	Sec. 157.438(A) and Sec. 157.438(B) STANDARDS APPLICABLE TO SPECIAL USES	18
11.0	Sec. 153.04(C)(7) LASALLE/SINCLAIR FACTORS	25
12.0	CONCLUSION	28

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

EXHIBITS

Exhibit A. Special Use Permit Application

Exhibit B. Organizational Information

Exhibit C. Figures

Exhibit D. List of Participating Landowners **Did not include in ZBA Packet - See Legal Notice**

Exhibit E. Site Plan

Exhibit F. Statement from Road Official *******

Exhibit G. Agricultural Impact Mitigation Agreement *******

Exhibit H. Interconnection Application *******

Exhibit I. Protected Species *******

Exhibit J. SHPO Consultation *******

Exhibit K. FAA Notice Criteria Tool Results *******

Exhibit L. Road Condition Report

Exhibit M. Noise Study

Exhibit N. Drain Tile Map

Exhibit O. Waste Management Plan *******

Exhibit P. Visual Simulations *******

Exhibit Q. Vegetation Management Strategy

Exhibit R. Health and Safety Impacts of Solar Photovoltaics

Exhibit S. Decommissioning Plan *******

Exhibit T. Emergency Response Plan

Exhibit U. Glare Study *******

Exhibit V. Property Impact Analysis

Exhibit W. Economic Impact Analysis

Exhibit X. Avoided Pollution Report

Exhibit Y. Catastrophic Incident Coordination and Recovery Plan

Exhibit Z. Stormwater Management Plan *******

1.0 INTRODUCTION

Mackinaw Solar LLC (“Mackinaw Solar”), a subsidiary of Doral Renewables LLC, dba Doral LLC, (“Applicant”), hereby submits this application for a Special Use Permit (“SUP Application”) to construct, operate, and maintain a 500-megawatt (“MW”) commercial solar energy facility (“Mackinaw Solar Project” or “the Project”) on approximately 3,400 acres (“Project Area”). Tazewell County Special Use Permit Application Form is included in **Exhibit A**. The company’s certificate of formation and organizational chart are included in **Exhibit B**.

The Project is being studied by the Regional Transmission Operator (“PJM”) and local utilities. The Project expects to execute a Generator Interconnection Agreement with PJM in the first quarter of 2027. This will allow for the full output of power to be delivered to the electric grid in 2029. Construction is proposed to commence in 2027, to support the Project being commissioned by the end of 2029. The Project represents an investment of approximately \$600 Million in Tazewell County. The expected operational life of the Project is 35 years.

The Project is depicted in **Exhibit C – Figure 1. Overview Map**. The Project Area is made up of approximately 60 parcels owned by private landowners, listed in **Exhibit D**. Owner Consent forms are also included in Exhibit D. The Project Area primarily includes cultivated agricultural land west of State Route 29; north of Warner Road, south of East Manito Road; and east of Spring Garden Road in Spring Lake and Cincinnati Townships, Tazewell County, IL.

The Special Use Permit Site Plans in fond in **Exhibit E** (the “SUP Plans”) The final solar panel layout will not exceed the parcel boundaries on the layout presented in this Application. Applicant anticipates the final fenced-in solar array area to be approximately 2,800 to 3,000 of the 3,400 acres depicted in the SUP Plans.

The Point of Interconnection (“POI”) for the Project is the existing Powerton Substation owned by ComEd. The Powerton Substation is located west of the Powerton Generation Station, north of East Manito Road, and south of the Illinois River.

The Project will deliver power to the electrical grid through two proposed 345 kilovolt (“kV”) Project-owned substations which will be connected to the POI with an approximately 12-mile-long transmission line (“Gen-Tie Line”). The Western Project Substation will be located in the Western Array Area and the Eastern Project Substation will be located in the Eastern Array Area, depicted on the SUP Plans. The Gen-Tie Line right-of-way (“ROW”) will encompass approximately 400 acres sited across 23 parcels.

In the three years prior to filing the SUP Application, Mackinaw Solar has regularly engaged the public to provide awareness and details of the Project. The Project team has also reached out to the City of Pekin, Village of South Pekin, Cincinnati and Spring Lake Townships, Tazewell County Staff, and other members of the community.

In March of 2026 a project Facebook page and website were launched. These pages will continue to be updated with relevant information throughout project development. For direct contact information, a project phone line and email can be found on both pages.

The Project opened a local office in May of 2026, staffed with a local employee, and began hosting weekly office hours for the community to ask questions and learn more. The local office will continue to hold hours throughout the life of the Project.

Prior to filing the SUP application, the Project Team held a community open house on July 29, 2026, open to owners of neighboring parcels and various other stakeholders. Approximately 50 people attended the community open house to hear details about the Project.

2.0 SECTION 157.437 SPECIAL USE APPLICATION REQUIREMENTS

2.1 Applicant Information

Applicant Name: Stanci March
Company Title: Sr. Manager, Development
Company: Mackinaw Solar LLC
Company Address: 2 Logan Square, Philadelphia, PA 19103
Phone Number: (445) 447-2900

About Doral Renewables

Mackinaw Solar LLC is owned by Doral Renewables LLC. Doral Renewables, headquartered in Philadelphia, partners with farmers across the United States to advance sustainable energy solutions and support local economic development. Recognizing the importance of renewable energy to rural communities, Doral works with landowners to help maximize the long-term value and productivity of their land.

Focused on solar and energy storage development, Doral has built a portfolio of more than 17 gigawatts, including over 900 MW under construction and 448 MW in operation. Its projects span 21 states and 7 electricity markets, underscoring Doral's commitment to agricultural communities nationwide and to creating new opportunities for farmers through solar energy.

Through long-term agreements, we are collaborating closely with farmers to innovate and tailor solutions, like agrivoltaics practices that harness the power of the sun while preserving valuable agricultural farmlands and diversifying crop production. Our partnerships with U.S. customers have resulted in over \$3 Billion in long-term wholesale power purchase agreements, ensuring stability for our projects' operations.

To propel our mission forward, we've garnered substantial support, raising over \$1 billion in capital equity and securing over \$1.5 billion in project financing from leading investors. Our diverse group of international partners includes the expertise of Doral Renewable Energy Resources Group (TASE:DORL), Migdal Insurance Company, and US-based Clean Air Generation, coupled with financial backing from APG, underscores our dedication to advancing sustainable practices in farming communities.

At Doral Renewables, we're not just developers of renewable energy – we're partners dedicated to empowering farmers and communities, and cultivating a brighter, more sustainable future through economic revitalization, community development, agrivoltaics and beyond.

About Agrivoltaics

The Mackinaw Solar Project will incorporate a dual use, both renewable energy and agrivoltaics. Agrivoltaics technology has recently emerged and has been praised as the path to the future for solar developers and farmers. Agrivoltaics practices allow farmers to grow crops underneath and in between the solar panels, or use land underneath the solar panels for grazing, creating a win-win situation that includes agricultural uses as a dual use with renewable energy.

Agrivoltaics is the use of land for both agriculture and solar photovoltaic energy generation. Solar grazing is a variation where livestock graze in and around solar panels. This system looks at agriculture and solar energy production as complements to each other instead of competitors. By allowing working lands to continue working, agrivoltaic systems help farms diversify income. Other benefits include energy resilience and a reduced carbon footprint.

A symbiotic ‘cooling’ relationship occurs when growing crops, or native grasses and forbs, under solar panels. Together, each helps keep the other cool. While all crops need sunlight to grow, too much can cause some to get stressed, especially cool season plants such as brassicas. Plants growing under the diffused shade of photovoltaic panels are buffered from the day’s most intense rays. Shade reduces air temperature and the amount of water evaporating from soil, a win-win for plants on hot summer days. The plants in turn give off water vapor that helps to naturally cool the photovoltaic panels from below, which can increase panel efficiency.

Doral’s Dual-Use Agrivoltaics

Doral helps farmers cultivate their crops and livestock on its project sites, creating a unique relationship between the project and the farmland. Doral’s Mammoth Solar Project in Indiana uses agrivoltaics daily, with over 2,000 sheep grazing on-site and additional crops grown within and around the project area. In 2024, Mammoth Solar was awarded Best Dual Use Plan of the Year from the North American Agrivoltaics Awards. Doral’s vision is to incorporate agrivoltaics into all of our projects, including Mackinaw Solar Project.

2.2 Property Owner Information and Legal Descriptions

Please see the Participating Property List included in **Exhibit D** for a list of all participating landowners, parcel ID numbers, and parcel legal descriptions obtained from Tazewell County’s online GIS Map. This list also includes the zoning classification for each Participating Property. Owner Consent Forms are also included in **Exhibit D**.

2.3 Project Location and Description of Proposed Use

The Project consists of the construction and operation of a photovoltaic (“PV”) electricity generating facility and associated infrastructure on approximately 3,400 acres of rural agricultural land in Tazewell County, Illinois. The Project has a design capacity of 500 MW alternating current (“AC”) at the POI. The Project will consist of approximately 1,100,000 solar panels, 130-140 inverters, 2 Project substations and an approximately 12-mile 345kV Gen-Tie line. The Project Gen-Tie line will connect the Project Substations to the POI. Interior gravel roadways with a width of 16 feet will provide access routes to the inverters. At their greatest tilt, the solar panels will have a maximum elevation of approximately 12 feet above ground. The final quantities and manufacturer’s specifications and recommended installation methods for all major equipment will be provided at the time of building permit application.

The solar panels will be mounted on a tracker system that rotates from East to West following the sun's path each day. The racking system foundations will be driven metal piles. All panels will be within fenced areas and various levels of trees and landscaping will be provided at key areas to provide visual screening. Wetlands and other existing waterbodies will be avoided to the extent reasonably possible.

The main components of the Project include:

Solar PV Panels – Photovoltaic panels are comprised of silicon wafers and conduit, which are adhered directly to a substrate and encased in safety glass and metal. The panels are constructed with non-reflective coatings and/or glass. These panels are designed specifically to absorb as much sunlight as possible in order to maximize electrical generation. The goal of solar panels is not to reflect sunlight, but rather to absorb it, making glare a relative non-issue. The panels chosen for this project are likely to have an output rating of 600-630 watts of direct current ("DC") power and are linked to one another via junction boxes to form an array.

Racking to Fasten and Support the Panels – Steel piles are driven into the soil (the depth of the piles depends on the groundwater table and soil conditions). Horizontal beams are then affixed to piles as part of the mounting structure, and the panels are then secured to the structures. The solar panels will typically not exceed 12 feet in maximum height above grade during normal operating conditions.

Tracking System – The panels are mounted on tracking systems, which increase Project output by orienting the solar arrays directly to the sun. A tracker follows the sun from east to west over the course of a day and stows parallel to the ground at night. The maximum tilt of the solar panels is typically approximately 60 degrees from the ground.

Inverters and Transformers – Inverters are electronic devices which convert solar electricity from DC to AC. They will be located towards the interior of the Project Area, away from perimeter fencing. Each inverter will be paired with a co-located medium voltage transformer that will step up voltage from the level found on the arrays to a level more efficient for collection lines leading towards the project substation.

Electrical Cabling and Conduit – The above referenced inverters and medium voltage transformers connect to a Project substation via underground 34.5kV medium-voltage cabling.

Project Substations – The Project will include up to two substations. The Western Project Substation will be located in the Western Array Area and the Eastern Project Substation will be located in the Eastern Array Area. Each substation will include two main power transformers, which will step up voltage from the 34.5kV medium voltage cables from the inverters to 345kV which is the voltage rating of the POI.

Gen-Tie Line – Power created by the Project will be delivered to the POI from the Project Substations via a 345kV aboveground electric transmission line. The Gen-Tie line will be constructed using steel monopoles. Figure 1 (**Exhibit C**) depicts two Route Alternatives at the northern end of the Gen-Tie line. The final route will be determined during the detailed engineering stage. Portions of the Gen-Tie Line may be buried at the POI if required by the interconnection utility.

Perimeter Fencing, Site Access and Internal Roads – The Project includes perimeter security fencing with controlled points of ingress and egress. Roads within the site provide access to the Project equipment.

2.4 Present and Proposed Land Use

The present use of the Participating Parcels includes commercial row-crop agriculture. The proposed land use is for a utility-scale solar energy generation facility, as well as for agrivoltaic uses including crop growth, grazing, and pollinator plantings.

2.5 Surrounding Zoning Classifications

The Participating Parcels are zoned A-1, CONS, and I-2 which allow solar energy systems as a special use. Surrounding Zoning Classifications are depicted on Figure 2. Tazewell County Zoning Map included in **Exhibit C**. The surrounding land is primarily zoned as A-1 Agriculture and CONS with limited amounts of R-1 Residential to the east of the project and one adjacent parcel zoned C-2 Commercial.

2.6 Explanation for Need for Special Use at the Proposed Site

There is a need for the proposed Project in Tazewell County. The Project will provide substantial new electricity-generating capacity, strengthen the reliability and diversity of the regional energy supply, and will help meet growing demand for clean, locally produced power. At the same time, the Project will preserve productive agricultural use through agrivoltaics and provide stable supplemental income to participating families. The project will also create jobs and generate significant long-term tax revenue for local schools and government agencies, as described in greater detail herein.

2.7 Site Plan

The SUP Plans, including existing conditions, proposed conditions, parking and loading areas, proposed water and sewage systems where applicable, placement of exterior lighting where applicable, and preliminary vegetative screening plans, are featured in **Exhibit E**. These comprehensive plans encompass the elements listed in Sec. 157.437(G) of the Special Use Application Procedure section of the Tazewell County Zoning Ordinance. This includes, but is not limited to, the planned location of solar panels and related project infrastructure, including the substation, operations maintenance building, electric cabling to the substation, ancillary equipment, and third-party transmission lines. It also includes existing site conditions including participating and non-participating residences, occupied community buildings, parcel boundary lines, setback lines, and public access roads. It also includes flood plains, drainage structures (e.g., surface ditches and subsurface drainage lines), vegetative screening, and the layout of all structures within the geographical boundaries of any applicable setback. It also includes setbacks around the pivot points of center-pivot irrigation systems. Wellhead locations will be confirmed in the field during the design process and setbacks will be adjusted accordingly.

2.8 Copy of Site Plan

Copies of the preliminary SUP Plans have been included in **Exhibit E**. If certain size hard copies of the SUP Plans are required Applicant will provide upon request.

2.9 Statement from Road Official

Applicant has been in contact with the Tazewell County Engineer, the Cincinnati Township Road Commissioner, and the Spring Lake Township Road Commissioner and has obtained written confirmation from each road official, confirming that the proposed access ways are adequate for the proposed use and that each road official will work with the Applicant to create Road Use Agreements for use of the roads. These statements are included in **Exhibit F**.

3.0 Sec. 153.04(C) ADDITIONAL APPLICATION DOCUMENTS

3.1 Agricultural Impact Mitigation Agreement

The Illinois Counties Code (55 ILCS 5/5-12020) requires the owner of a commercial solar energy facility to have an Agricultural Impact Mitigation Agreement (“AIMA”) with the Illinois Department of Agriculture in place before a siting permit hearing can take place. Applicant executed the AIMA on July 28, 2026. This is included as **Exhibit G**.

3.2 Interconnection Proof

Mackinaw Solar holds queue position AG2-363 and AG2-364 in PJM’s Transition Cycle 2 (TC2) for the solar generation component of the Project. In its application, Mackinaw Solar requested a total of 500 MW, with Capacity Injection Rights of 300 MW. Communication has occurred primarily through the PJM interconnection process with the Project’s Phase 1 Study report issued on October 29, 2025, and the Project’s Phase 2 Study report issued on June 3rd, 2026. The Phase 2 Study is located online here: [Transition Cycle 2](#)

The Project is currently being evaluated under PJM’s Phase 3 cluster study. According to the most recently published milestone calendar from PJM, Phase 3 is currently projected to conclude on January 4th, 2027. Mackinaw Solar expects to execute a Generator Interconnection Agreement (“GIA”) with PJM in Q1 2027.

Proof of application to the ISO for interconnection is included as **Exhibit H**.

3.3 Protected Species / EcoCAT / USFWS IPaC

Pursuant to the Indiana Department of Natural Resources (“IDNR”) Ecological Compliance Assessment Tool (“EcoCAT”) process, the Applicant consulted with IDNR for potential impacts to state threatened or endangered species. EcoCAT contains the Section, Township, and Range data of the Project and generates a Project map. State threatened and endangered species of concern that may occur within the identified Project Area are examined as part of the EcoCAT review process. This includes species which may be affected by migrating through or, by reason of the Project, avoiding the identified area. Further, EcoCAT requires that state agencies and units of local governments consider the potential adverse effects of proposed actions on Illinois endangered and threatened species and sites listed on the Illinois Natural Areas Inventory.

The Applicant submitted an EcoCAT review request to IDNR in June 2026. The Applicant consulted with IDNR through the Department’s online EcoCAT program for potential impacts to the State threatened and endangered species. The Applicant received a formal response letter from IDNR’s EcoCAT review dated June 17, 2026, which is provided in **Exhibit I**. The Applicant will continue to coordinate with the IDNR in response to the EcoCAT review to ensure compliance with all IDNR and Illinois statutory requirements.

Applicant consulted the U.S. Fish and Wildlife Service (“USFWS”) Information for Planning and Consultation (“IPaC”) assessment tool on August 5, 2026 to determine the federally listed species that may be impacted by the Project (**Exhibit I**). The Applicant will follow all necessary best management practices during construction and operation of the Project to avoid impacts to federally listed species.

3.4 Protected Lands

The proposed project is avoiding protected lands as identified by the IDNR and the Illinois Nature Preserve Commission. **Exhibit C – Figure 3. Protected Lands Map** depicts the Project in relation to protected lands. No protected lands are located within the Project Area. The Manito State Habitat Area is across Spring Lake Road and North Manito Road from the Western Array Area and is open to rabbit, pheasant and quail hunting by lottery only. The Powerton Lake State Fish and Wildlife Area is located north of the Project POI. No setbacks are required from either of these IDNR sites per the EcoCAT review provided in **Exhibit I**.

3.5 Illinois State Historic Preservation Office

Projects in Illinois can come under the purview of two primary cultural resources regulations: the National Historic Preservation Act (“NHPA”) and the Illinois State Agency Historic Resources Preservation Act (Section 707). Both are administered by the Illinois State Historic Preservation Office (“SHPO”), which is housed within the IDNR. Agencies requiring SHPO consultation concurrent with their review include the Illinois Environmental Protection Agency (“IEPA”), IDNR, and U.S. Army Corps of Engineers (“USACE”). The SHPO’s role is to advise, review, and consult, and as such, is responsible for reviewing and commenting on potential effects of the Project on archaeological and/or architectural (cultural) resources.

The Project contacted the SHPO to determine if any historic or archaeological sites are located within the Project Area. A response letter provided by the SHPO, dated May 17, 2026 (**Exhibit J**), states that portions of the Project Area have a high probability of containing significant archaeological resources. In addition, known archaeological sites are present within the Project Area.

Accordingly, a Phase I archaeological survey to locate, identify, and record all archaeological resources within the Project Area will be required. In addition to the archaeological survey, SHPO also requires addresses and color photographs of all structures in or adjacent to the Project Area. This includes structures within a one-quarter mile area of potential visual effects.

Applicant will follow this guidance and continue to coordinate with SHPO through construction of the Project.

3.6 Compliance with FAA

The Federal Aviation Administration’s (“FAA”) interim policy for Solar Energy System Projects on Federally Obligated Airports requires FAA screening only for solar projects located on the grounds of an airport. However, Applicant understands that the Project is located within ten miles of three airports/landing strips so it utilized the FAA’s Notice Criteria Tool to determine whether the Project needed to pursue additional consultation with the FAA. See **Exhibit K** for additional details.

The FAA Notice Criteria Tool results indicate that the Eastern Solar Array Area meets FAA notice criteria and require submission of notice to the FAA prior to construction. The screening

indicates that the notice must be submitted at least 45 days before the start of the proposed construction or alteration or the date an application for a construction permit is filed, whichever occurs first.

The FAA Notice Criteria Tool results also indicate that the Transmission Line Facilities meet FAA notice criteria and require submission of notice to the FAA prior to construction. Similar to the Eastern Solar Array Area, the screening specifies that notice must be submitted at least 45 days before the start of construction or the filing of a construction permit application, whichever occurs first.

The FAA Notice Criteria Tool evaluation completed for the Western Solar Array Area indicates that FAA notice is not required based on the locations and structure heights evaluated as part of the screening.

The Applicant will follow this guidance and submit notice at least 45 day before the filing of the Tazewell County Building Permit Application.

4.0 Sec. 153.05 DESIGN AND INSTALLATION

4.1 Code Compliance

The Project has been and will continue to be designed in accordance with the International Codes, National Electrical Code enforced by Tazewell County in addition to all other requirements of State and Federal regulatory agencies.

During the Building Permit Process, and as stated in Section 153.05 (A)(1) of Tazewell County Renewable Energy Ordinance, the Mackinaw Solar Project will conform to all applicable industry standards, including those of the American National Standards Institute. The Applicant is prepared to submit certificates of design compliance obtained by the equipment manufacturers. All solar equipment proposed for the project will be new and commercially available.

Solar Energy Systems have extremely low risk of fire and explosive hazards. The vast majority of the Project consists of solar panels and racking, which are not flammable, and the panels are protected by tempered glass. A landmark study by North Carolina State University (attached as **Exhibit R** describes this risk in detail:

...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 back sheets (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.

The panels are considered non-hazardous by U.S. Environmental Protection Agency ("EPA"). The Project will incorporate PV panels. The same study from North Carolina State University provides the following analysis:

Well over 80% (by weight) of the content of a PV panel is 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 back sheet, EVA encapsulation of the PV cells, polyphenol 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.

Stray voltage remains a very low risk in the Project Area. Stray voltage issues and remedies are detailed in the U.S. Department of Agriculture's Handbook Number 696. The Project will have a minimal impact on stray voltage risk in the context of the other utility-scale electric infrastructure in the area. The utility will install power-quality meters and recloser devices at the point of interconnection for the Project. This will assist in identifying and mitigating any stray voltage issues on the local circuit if they are present.

The Project will comply with all applicable local, state, federal and national codes and regulations. These include the State of Illinois Plumbing Code, the State of Illinois Electric Code, the State of Illinois Uniform Building Code, the National Electric Code, the National Electric Safety Code, and all Tazewell County requirements. The Applicant understands these requirements and all final engineering documents shall be designed in accordance with these standards.

4.2 Temporary Site Posting

Before construction begins and while under construction, the Project Parcels will have a posting which includes but may not be limited to: the facility's name, the name of the Engineering, Procurement and Construction ("EPC") firm developing the site, contact information for the EPC representative managing site development and the assigned 911 address. The temporary sign shall not be less than fifteen (15) square feet and will be clearly visible from the public roadway.

4.3 Lighting

All outdoor lighting shall be designed and installed compliant with Section §157.056 of the Tazewell County Zoning Code for Outdoor Lighting and any other required regulatory authority in an effort to minimize visual impact.

Per Section 157.056, all outdoor lighting shall be located, screened, or shielded so that neighboring properties are not illuminated. No outdoor lighting shall be of such intensity or brilliance so as to cause glare or to impair the vision of drivers. Except as specifically exempted below, the maximum permitted luminaire height shall be 40 feet. Applicant will comply with all requirements for lighting.

4.4 Parcel Identification Number

Applicant, at its own expense, will utilize an Illinois registered land surveyor to prepare a metes and bounds survey description of the land upon which the project is installed, including access routes, over which Mackinaw Solar has exclusive control. Applicant will deliver a copy of the

survey to the Chief County Assessment Officer and to the owner of the land upon which the project is constructed.

4.5 Roads

Per the Special Use application requirements, Applicant has been in communication with the Tazewell County Engineer, the Cincinnati Township Road District Commissioner, and the Spring Lake Township Road District Commissioner (the “AHJs”). The AHJs have been provided with a copy of the Haul Route Map and all AHJs have provided Applicant with confirmation that the proposed roads and access ways from the proposed roads will be adequate for the project, subject to Road Use Agreements with each AHJ, correspondence attached hereto as **Exhibit F**.

Applicant has prepared a preliminary Road Condition Report, attached hereto as **Exhibit L**.

Applicant will follow all requirements listed in Section 157.056 A.5. of the Tazewell County Renewable Energy Ordinance as it works with the AHJs to enter into road use agreements. The Road Use Agreements may include, but need not be limited to the following provisions:

- a. A Haul Route Map for review and approval by the respective Road District Commissioner and the County Engineer prior to the granting of the Building Permit. Traffic for construction purposes shall be limited to these roads. As stated above, Applicant has already provided the Haul Route Map to the AHJs.
- b. A pre-construction road surface scan shall be conducted to determine existing road conditions for assessing potential future damage. Applicant will continue to work with the AHJs to provide a study that all parties mutually agree upon.
- c. Required roadway improvements; pre-construction, road upgrades needed prior to commencement of the construction of the facility to ensure the existing roads are capable of withstanding the proposed traffic and loading, and post construction.
- d. The applicant shall obtain a weight or size permit from all appropriate government agencies, to include: Illinois Department of Transportation, the County, townships and municipalities prior to construction.
- e. Any road damage caused by the transport of the facility’s equipment, the installation, maintenance or removal must be completely repaired to the satisfaction of the Road District Commissioner and the County Engineer. The Road District Commissioner and the County Engineer may choose to either require remediation of the road repair upon completion of the facility or are authorized to collect fees for necessary remediation.
- f. If applicable, financial assurance in the amount agreed upon by the Road District Commissioner and County Engineer to ensure future repairs are completed to their satisfaction shall be provided.

Applicant acknowledges that all repairs and improvements to public roads and roadway appurtenances shall be subject to the prior approval of the AHJs before being made and shall also be subject to inspection and acceptance by the County after such repairs and improvements are completed. Applicant acknowledges that the County’s Road Use Agreement regarding the maintenance and repair of public roads and highways, must be approved by the Tazewell County Board and must include the form of financial assurance required by the County prior to the approval of any Building Permit.

4.6 Noise Levels

Per Section 153.05 A.6. of the Tazewell County Renewable Energy Ordinance, solar energy facilities must provide proof of compliance with noise regulations of the Illinois Pollution Control Board (“IPCB”). Applicant has prepared a Noise Study, attached as **Exhibit M**.

The Noise Study results demonstrate that the Project is expected to operate in compliance with the IPCB sound level limits. As required by the Tazewell County Renewable Energy Ordinance, Applicant shall, prior to the first anniversary of commercial operation, provide an octave band sound pressure level measurement conducted by a third party acoustic consultant or engineer to further demonstrate compliance with the noise regulations of the IPCB.

4.7 Farmland Drainage Plan and Tile Repair

Applicant has engaged a drainage and drain tile consultant, to assist with preparing all documents required by Section 157.05 A.7. of the Tazewell County Renewable Energy Ordinance. Applicant and its consultant will provide a comprehensive approach to identifying, evaluating, and documenting agricultural drainage systems within and surrounding the Project area. The work will include topographic, watershed, and sub-watershed analyses, and coordination with landowners, producers, adjacent property owners, drainage districts, and local jurisdictions to identify existing drainage infrastructure and gather available drain tile records.

To date, historical aerial imagery, landowner interviews, and drainage district coordination have been used to locate potentially impacted drainage facilities and prepare a desktop drain tile study to obtain an understanding of locations of drain tiles within the Project Area and determine upstream and downstream drainage flow. This study is found in **Exhibit N**

The final drainage plan will document drainage infrastructure, identify potential crossings and impacts, and include procedures for repairing damaged subsurface drainage systems in accordance with applicable Illinois drain tile repair standards. All stakeholder outreach and drainage information will be documented, and the final deliverables will provide the County, affected drainage districts, and the Applicant with the information necessary to support compliance with ordinance requirements related to drainage planning, tile identification, repair protocols, and restoration of agricultural drainage systems.

4.8 Waste

Per Section 157.05 A.8. of the Tazewell County’s Renewable Energy Ordinance, Applicant has prepared a draft Waste Management Plan, attached hereto as **Exhibit O**, which sets forth that all solid waste will be removed from the site immediately and disposed of in an appropriate manner. The Waste Management Plan also addresses the safe disposal of any hazardous waste materials, which will be in a manner consistent with all local, stated, and federal rules and regulations.

4.9 Setbacks

Per Section 153.05 B.1. of the Tazewell County’s Renewable Energy Ordinance, any component of a Commercial Solar Energy Facility is subject to the following setbacks:

- Occupied Community Buildings and Dwellings on Nonparticipating Properties, one hundred fifty (150) feet from the nearest point on the outside wall of the structure.
- Public Road Rights-of-Way, 50 feet from the nearest edge.

- Boundary lines of Nonparticipating Property: fifty (50) feet to the nearest point on the property line of the non-participating property.

The Applicant understands that these measurements listed are from the nearest edge of any above-ground component of the facility, excluding fencing.

The Project will adhere to the requirements set forth above. The Project demonstrates its compliance in the Site Plan, included as **Exhibit E**.

4.10 Height

Per Section 153.05 B.2. of Tazewell County's Renewable Energy Ordinance, no component of a solar panel may have a height of more than twenty feet above ground when the arrays are at full tilt.

The Project will adhere to the requirements set forth above. Solar panel height is anticipated to be between nine and twelve feet above ground level.

4.11 Fence

Per Section 153.05 B.3. of Tazewell County's Renewable Energy Ordinance, the facility's perimeter must be enclosed by fencing having a height of at least six feet and no more than twenty-five feet.

The Project will adhere to the requirements set forth above. The applicant intends to use six to seven foot tall wildlife fencing mounted on wooden posts. Substations will have a six-foot tall chain link fence with 1-foot of barbed wire on the top, as required by the National Electric Code.

4.12 Screening

The Project will provide vegetative screening for all nonparticipating residences with direct sightlines within 500 feet of the solar facility. Screening will comply with all requirements in Section 153.05 B.4 of Tazewell County's Renewable Energy Ordinance. The Special Use Plans in **Exhibit E** display the proposed screening locations and more vegetative details. Vegetative screening locations are subject to change during final engineering, but will remain in compliance with the standards of Section 153.05 B.4. The Applicant will work with Tazewell County and nearby residences to install vegetative screening as needed.

The Applicant has provided visual simulations in **Exhibit P**. Photographs were collected on July 22, 2026 and then the Project design was incorporated into the photographs to create the simulations. These visual simulations depict proposed screening at Key Observation Point ("KOP")-01 along Warner Road and KOP-04 along State Route 29. These demonstrate that the Project will not create undue adverse aesthetic and visual impacts to neighboring properties so that the normal and orderly development and improvement of surrounding properties is not negatively impacted.

4.13 Vegetation and Agrivoltaics

The Applicant has included a draft Vegetation Management Strategies Memo ("VMP"), **Exhibit Q** consistent with Sec. 153.05 B.5. of the Tazewell County Renewable Energy Ordinance. This draft VMP is consistent with the goals and objectives of the Pollinator-Friendly Solar Site Act and the AIMA. Ground cover included in the draft VMP was selected specific to the Project site soils, and for the purposes of lessening stormwater runoff and erosion. The VMP also includes a

description of the maintenance methods, including both the interior of the facility and the perimeter surrounding the facility fence.

The Mackinaw Solar Project represents a unique opportunity for Tazewell County to pair renewable energy generation with strengthened agricultural resilience, improved soil health, and long-term ecological restoration.

Applicant engaged American Farmland Trust to review and assess the Mackinaw Solar Project and to outline various vegetation management strategies that will be incorporated into the final Project, which have been included in the VMP. Within the project area, a variety of vegetation management strategies have been tailored to the site specifications and can be implemented to improve onsite soil health, ecological function, and agricultural outcomes. They are:

- A. preconstruction vegetation for soil stabilization,
- B. permanent native vegetation to reduce erosion risk, establish native habitat, and improve soil health,
- C. pasture with forage species for grazing within and around the solar panels,
- D. pollinator habitat on select acreage,
- E. noxious weed management strategies, and
- F. expanded integration of agriculture into Rights-of-Way and setbacks.

These strategies are intended to reduce runoff and erosion, protect and improve topsoil, support pollinator habitat, and maintain productive agricultural use where appropriate. Rights-of-way, setbacks, and perimeter areas may also incorporate pasture, native pollinator plantings, shrub crops, nut-bearing trees, and other specialty or perennial crops to provide habitat benefits, food or forage production, and visual buffering where vegetative screening is required.

Applicant shared the draft VMP with Tazewell County Soil and Water Conservation District and the U.S. Department of Agriculture Natural Resources Conservation Service staff for recommendations regarding vegetation establishment, including pre-construction stabilization, species mixes, and seeding rates for grazing and native pollinator habitat. This feedback was incorporated into the VMP. The VMP will be consistent with the Pollinator-Friendly Solar Site Act and the AIMA.

Emerging research indicates that replacing annual row-crop production with permanent perennial vegetation beneath solar arrays can improve multiple indicators of soil health while enhancing broader ecosystem services. Across 30 solar facilities in the Midwest, Walston et al. (2021) found that restoring native grassland vegetation increased pollinator supply threefold, increased carbon storage by 65%, improved sediment retention by more than 95%, and increased water retention by 19% compared to pre-solar agricultural land uses. Recent studies of commercial solar grazing operations have similarly documented positive trends in soil health and pasture quality, demonstrating that well-managed vegetation can support both renewable energy production and long-term agricultural stewardship (Andrew et al., 2025).

Sheep grazing is Mackinaw Solar's preferred means of ongoing vegetation management within and around the solar arrays. Establishing forage-based pasture within the fenced Project Area can provide effective vegetation control while maintaining the land in active agricultural use, reducing reliance on mechanical mowing, and supporting long-term soil health. The Project's secure, fenced, contiguous acreage may also support local sheep producers in a county where pastureland is limited by providing land access, diversifying agricultural production, and

generating additional farm income. Grazing areas will be established with appropriate vegetation mixes, with stocking rates and management practices adapted to site-specific soil conditions and forage productivity.

In support of the project's commitment to sustaining agricultural production within the project area, Doral has established a scholarship program for local shepherds and graziers to pursue certification through the American Solar Grazing Association). This initiative reflects Doral's broader goal of building local workforce capacity and job training opportunities in advance of construction, ensuring that the community has trained personnel ready to support agrivoltaic grazing operations once the project becomes operational. Rather than removing land from agricultural use, the project is designed to support a transition to livestock grazing, particularly sheep, within portions of the site, a land use that offers documented benefits for soil health, organic matter retention, and long-term soil regeneration. Doral is also evaluating other forms of agrivoltaic production, such as pollinator habitat, native grasses, and other compatible crops, to determine the best fit for specific areas of the site based on soil conditions, topography, and surrounding land use. Taken together, these efforts reinforce the site's continued contribution to the local agricultural economy throughout the life of the project.

5.0 Sec. 153.06 OPERATION AND MAINTENANCE

5.1 Facility Owner

Per Section 153.06 A.1. of Tazewell County's Renewable Energy Ordinance, Applicant acknowledges that any transfer of ownership of the Facility must be reported to the County sixty (60) days prior to the transfer. Note that Applicant plans to own and operate the Project and does not anticipate transfer of the Facility.

5.2 Permanent Address Posting

Per Section 153.06 A.2. of Tazewell County's Renewable Energy Ordinance, Applicant will work with the Community Development Department on a 911 address for each access point for the Facility and will post the addresses on the property as required by the Tazewell County Address Display Ordinance.

5.3 Operation and Maintenance Contact

Per Section 153.06 A.3. of Tazewell County's Renewable Energy Ordinance, Applicant will provide a local contact for Operations and Maintenance to the County and will, at all times, ensure proper contact information is on file with the County. As required by the Ordinance, Applicant will update the local contact information with the County on an annual basis on or before the anniversary of commercial operation and will update any change in the local contact with both the County and on any site posting, within 7 days following the change.

5.4 Annual Report

Per Section 153.06 A.4. of Tazewell County's Renewable Energy Ordinance, Applicant will submit an annual report to the Community Development department including the annual energy production and/or energy consumption and water usage if applicable. The annual report will include any complaints received by Applicant detailing the remedy of said complaint and the timeline for remediation.

6.0 Sec. 153.09 LIABILITY INSURANCE

Prior to issuance of a building permit, Applicant will provide the County with all certificates of insurance and endorsements required by Section 153.09 of the Tazewell County Renewable Energy Ordinance. Additionally, as required by Section 153.09, Applicant shall defend, indemnify and hold harmless Tazewell County, its Board members, officers, employees and agents from and against any and all claims, actions, damages, liability, costs and expenses, including attorney's fees, arising out of or connected with the facility's operations, except to the extent caused by the County's sole negligence or willful misconduct.

7.0 Sec. 153.10 DECOMMISSIONING PLAN

Applicant has provided a preliminary Decommissioning Plan, **Exhibit S**. The Decommissioning Plan ensures the solar facility elements will be properly removed after the Commercial Solar Energy Facility reaches the end of its useful life. The Decommissioning Plan was developed in accordance with Section 153.10 of the Tazewell County Renewable Energy Ordinance, the requirements of the AIMA, and Section 5-12020 of the Illinois Counties Code. The Decommissioning Plan outlines the removal of Project components such as panels, roads, fences, and racking, including any applicable recyclable items once the solar facility is not in use. The Plan also includes the restoration of soil and vegetation, as well as any applicable drain tile repair. The seed mix that will be used throughout the Project Area is in keeping with the requirements of the AIMA. This will allow the land to be restored to agriculturally productive farmland after the Project is decommissioned.

The cost estimate associated with the Decommissioning Plan will comply with Sec. 153.10 of the Tazewell County Renewable Energy Ordinance and shall be increased at the inflation rate of the higher of either 2.5% or the average inflation rate of CPI-U of the three prior calendar years, at the time of approval. The cost estimate shall be phased over the life of the project as follows: (A) 10% before the first anniversary of the Commercial Operation Date; (B) 50% on or before the sixth anniversary of the Commercial Operation Date; and (C) 100% on or before the eleventh anniversary of the Commercial Operation Date.

Applicant will comply with all other applicable provisions of Sec. 153.10 of the Tazewell County Renewable Energy Ordinance, including but not limited to placement of financial assurance with the County in the form of a surety or like bond with ongoing updates/reevaluation of the Decommissioning Plan by the County as required by the Ordinance.

8.0 Sec. 153.11 EMERGENCY RESPONSE PLAN

Applicant has provided a draft Emergency Response Plan, **Exhibit T**. The Emergency Response Plan was developed in accordance with Section 153.11 of the Tazewell County Renewable Energy Ordinance. Applicant has consulted with relevant local authorities regarding emergency response planning for the Project. Engagement has included coordination with the Tazewell County Emergency Management Agency Director.

Throughout construction and operations, the Project will comply with all applicable provisions of Section 153.11 of the Tazewell County Renewable Energy Ordinance. Project leadership will continue to coordinate with local authorities to ensure appropriate plans, procedures, and systems are in place to effectively respond to emergencies.

Applicant has also provided a draft Catastrophic Incident Coordination and Recovery Plan, **Exhibit Y**, which provides a framework for Mackinaw Solar to coordinate with local emergency responders and the community before, during and after a catastrophic event affecting the facility or surrounding community. This Plan establishes procedures for emergency notification, resource coordination, damage assessment, debris removal, environmental protection, mutual aid support, and phased recovery activities to help ensure an organized response while providing local officials and the public with accurate information regarding cleanup, restoration, and facility recovery activities. Applicant will be responsible for clean-up of all Project debris regardless of the location of where debris from the Project is found.

9.0 SUPPLEMENTAL MATERIALS

9.1 Visual Simulations

As mentioned above in Section 4.1., Applicant has provided Visual Simulations in **Exhibit P**. Photographs were collected on July 22, 2026 and then the Project design incorporated into the photographs to create visual simulations. These visual simulations demonstrate that the Project will not create undue adverse aesthetic and visual impacts so that the normal and orderly development and improvement of surrounding properties is not negatively impacted.

9.2 Glare

The Applicant performed a Glare Study to determine if the glare resulting from Project operations would create a nuisance or hazard to adjacent landowners or interfere with traffic, including air traffic. The ForgeSolar program utilized for the Glare Study in **Exhibit U** visually depicts predicted glare effects using the following classification scheme on a series of Project Area maps:

- Green - Low potential for temporary after-image.
- Yellow – Potential for temporary after-image.
- Red – Potential for permanent eye damage.

The Glare Study concluded that, overall, a low to moderate amount of potential glare is predicted for certain limited locations within the Project. No “red” glare was predicted for the Project. Most of the potential glare, including all potential “yellow” glare, is associated with limited specific project locations that individuals will quickly pass through. Minor amounts of potential “green” glare are predicted for three houses. Applicant will install vegetative screening at locations with potential for yellow and green glare if necessary to mitigate potential for glare.

Solar panels are designed to maximize the absorption of sunlight which allows for overall reflectivity to remain low. The solar panels will be coated with anti-glare material to minimize the potential for concentrated reflection and glare. The Applicant will work with Tazewell County and nearby residences to install additional vegetative screening to mitigate any glare impacts if isolated instances of detrimental glare impacts are identified during the Project’s operational period.

9.3 Property Value Assessment

Applicant engaged CohnReznick, an independent, third-party advisory firm to investigate the potential for the Project to impact property values in and around the Project Area. CohnReznick’s extensive study included i) interviews with real estate brokers, ii) interviews with County and Township Assessors, iii) a thorough review of studies prepared by other real estate valuation

experts, and iv) an independent review of property values adjacent to ten comparable solar projects across the United States. The study demonstrates that the Project will not have a negative impact on property values for adjacent or nearby parcels. The results of the CohnReznick study are included in **Exhibit V**.

9.4 Economic Benefits

The total Project represents an investment of approximately \$600 Million in Tazewell County. Job opportunities will be created through construction and will also indirectly support other jobs in the area through supply chain and increased demand for goods and services. The Project is expected to create approximately 600 jobs in Tazewell County through both direct and induced employment during construction. There will be approximately 1,300 jobs created in the State of Illinois through similar direct and induced impacts during construction. Total earnings from the construction of the Mackinaw Solar Project, in both Tazewell County and the State of Illinois, will total approximately \$142 million. During operations, the project is expected to create approximately 48 jobs through on-site, local revenue and supply chain, and induced impacts. Three to five of the permanent jobs will be for direct on-site operations.

Over the life of the project, the Project is anticipated to result in over \$82 million of local taxes, averaging approximately \$2.7 million per year. These payments are higher in earlier years as the project will not have depreciated significantly. In the first 5 years of operations the estimated payments will range from \$4.0 million to \$3.7 million per year. Approximately 72% of the tax payments will go to local schools. This tax income will be used at the county's discretion to strengthen the local economy and help improve county services and local infrastructure. The Project will not require local governments to make investments in infrastructure improvements, nor will it increase the need for local services, ensuring the local taxes paid can bolster existing funding sources. The economic benefits associated with the Project are further described in **Exhibit W**.

9.5 Avoided Pollution and Public Health, Ecosystem, and Economic Impact Report

While the EPA has determined that solar panels themselves do not pose a danger to human health or the environment and are considered non-hazardous waste suitable for recycling at the end of their functional life, the Applicant asked Quantum Energy to evaluate the potential grid-level emissions reductions and corresponding life-cycle scale public health, ecosystem, and economic impacts of the Mackinaw Solar Project.

Quantum Energy's analysis simulates hourly grid-level changes in generation and air pollutant emissions. These simulations were validated against data from the U.S. Energy Information Administration to ensure accuracy. Public health, ecosystem, and economic impacts were estimated using reliable life cycle impact assessment methodologies and datasets. In its first year of operation, the Mackinaw Solar Project is projected to generate approximately 1,072 GWh of emissions-free electricity.

The Mackinaw Solar Project offers a substantial net positive outcome by significantly enhancing public health and ecosystem quality, delivering substantial positive economic impacts in year one and cumulatively throughout the project's life span. Additional details are available in **Exhibit X**.

9.6 Stormwater Management Report

Tazewell County Code Chapter 151 Erosion requires that the peak discharge rate from the post-development area shall not exceed the peak discharge rate from the pre-development area for 2-year and 25-year storm events. Additionally, the Illinois Environmental Protection Agency's Bureau of Water is responsible for overseeing the issuance of permits within the National Pollutant Discharge Elimination System program that regulates construction stormwater discharges. Additionally,

Applicant engaged Stantec to perform a preliminary stormwater analysis (**Exhibit Z**) that incorporates site topography, soil hydrologic group ratings, existing land use conditions and proposed land use conditions. Over the long term, infiltration is expected to increase, and runoff and erosion is expected to decrease, due to the conversion from existing cropland to grassland.

Mackinaw Solar will follow the Tazewell County Code when it prepares its final stormwater management plan. This will be submitted at the time of the building permit application, and Applicant will obtain an Erosion, Sediment and Stormwater Control Permit from Tazewell County.

The Project will have a negligible impact on rainwater runoff. The American Society of Civil Engineers published a landmark article, "Hydrology Response on Solar Farms." The study demonstrated that a large solar farm, with well-maintained vegetation underneath the panels, has a negligible effect on total volumes of runoff or peak discharge rates. This is because, though the panels are impervious to rainwater, the vast majority of the acreage is covered in the grass-seed mix. Therefore, the net increase in impervious ground surface is negligible. The study also found that, due to the transition of ground coverage from existing cropland to well-maintained prairie grass, it is anticipated that the post-development runoff will decrease in comparison to the pre-development conditions.

10.0 Sec. 157.438(A) and Sec. 157.438(B) STANDARDS APPLICABLE TO SPECIAL USES

Sec. 157.438(A)

1. The special use shall, in all other respects, conform to the applicable regulations of this chapter for the district in which it is located. Special uses when combined with variances for this same property shall be considered compliant for the purposes of this section.

The proposed special use is to allow the construction of a commercial solar energy facility on properties that are zoned A-1 District, CONS District and I-2 District. Section 153.04. B. of the Tazewell County Renewable Energy Ordinance states that solar facilities are permitted in the A-1 District, CONS District, and I-2 District upon approval of a Special Use. Applicant is not seeking any variances for the project and will otherwise meet all applicable regulations in the Tazewell County Code. If the Special Use Permit is granted, the Project will comply with all applicable regulations of the Tazewell County Ordinance, and all other applicable State and Federal regulations.

2. The special use will be consistent with the purposes, goals, objectives, and standards of the officially adopted county comprehensive land use plan and these regulations, or of any officially adopted comprehensive plan of a municipality with a one and one-half mile planning jurisdiction.

Tazewell County

The Project is consistent with the Tazewell County Comprehensive Plan because the solar development supports non-traditional agricultural activities, supplements farm income, and provides economic benefits to the County.

A. Agriculture

Agriculture Principle 3 provides that “non-traditional agricultural activities” should be “supported and allowed to flourish,” including “supplemental uses to supplement farm income and support the financial viability of farms.” Although the Comprehensive Plan does not explicitly mention solar energy, it identifies wind farms as an example of such supplemental uses, finding that “[e]stablishing wind farms at suitable locations will help family farms remain viable.”

As the Zoning Board of Appeals has repeatedly found in approved solar SUP cases, the Comprehensive Plan “specifically identifies wind farms but solar farms can also provide a supplementary income” to farmers in Tazewell County. In multiple cases, the Zoning Board of Appeals has found the solar project to be consistent with the Comprehensive Plan.

Here, the Project also advances the Comprehensive Plan’s agriculture goals by preserving the agricultural character of the land through agrivoltaics. The Project will maintain active agricultural use, including sheep grazing and crop production beneath and around the solar panels, creating a win-win dual use that combines agricultural activities with renewable energy production. The Project further provides participating landowners with long-term lease income, supplementing farm income while allowing continued agricultural use of the land.

B. Economic Development

The Project also provides significant economic benefits to the County, advancing Economic Development Principle 1 of the Comprehensive Plan. Under this Principle, the Comprehensive Plan calls for attracting “new businesses and industries to the County that provide valuable services and fulfill County needs” (Implementation Strategy 2) and for the County to “[p]repare to develop and attract businesses that relate to agriculture” (Implementation Strategy 5).

Here, the Project represents a \$600 million investment in Tazewell County. During construction, the Project will create approximately 600 jobs, both direct and indirect. Once operational, the Project will support 48 permanent positions, including both direct employment and indirect jobs in the local economy. The Project will generate over \$82 million in local taxes over its operational life, averaging \$2.7 million annually, with 72% going to local schools. In addition, Doral’s agrivoltaics program allows agriculture to continue on the land through sheep grazing and crop production, directly advancing the Comprehensive Plan’s call to develop and attract businesses that relate to agriculture. This significant economic contribution, combined with the Project’s support for continued agricultural use, fulfills the Plan’s goals of attracting new businesses that provide valuable services to the County.

City of Pekin

Portions of the Project area are within 1.5 miles of the City of Pekin and are subject to the City's extraterritorial jurisdiction. The City of Pekin adopted a Comprehensive Plan in 2006 and amended the future land use map in 2011. Importantly, the Project area is located outside Pekin's designated Future Growth Area and therefore will not interfere with the City's future planned development.

Population and Housing Goal 1 calls for the City to plan for population growth over the next 25 years with the objective to "[m]anage growth consistent with the City's ability to service existing and new developments." Similarly, Utilities Goal 3 calls for the City to provide safe and efficient electricity to current and future residents of the City. Plan at III-9.

Here, the Project will contribute 500 MW of clean energy to the grid. The additional capacity will help ensure the City has access to reliable, renewable electricity to support existing residents, accommodate future population growth, and meet increasing energy demands from new residential and commercial development. Despite not being included in the future growth area, this increased capacity is consistent with the Goals and Objectives of the City's Comprehensive Plan.

Village of South Pekin

The Project area is within 1.5 miles of the Village of South Pekin and is subject to the Village's extraterritorial jurisdiction. The Village of South Pekin has not adopted a Comprehensive Plan and therefore no finding is applicable here.

Village of Manito

The Project area is within 1.5 miles of the Village of Manito and is subject to the Village's extraterritorial jurisdiction. The Village of Manito has not adopted a Comprehensive Plan and therefore no finding is applicable here.

3. The petitioner has provided the information required by § 157.437, and has demonstrated the ability to complete the proposal shown in § 157.437(A) through (I), and has met those items required by the statements described in § 157.437(I).

As demonstrated in the second section of this narrative above, Applicant has provided a specific response to each provision included in Section 157.437 (A) through (I).

Sec. 157.438(B)

1. The site shall be so situated as to minimize adverse effects, including visual impacts on adjacent properties.

The Mackinaw Solar Project has been designed to minimize adverse effects, including visual impacts on adjacent properties. Applicant will install vegetative screening for all nonparticipating residences with direct sightlines to the Project that are located within 500 feet of the Project. Vegetative screening will also be used to minimize glare impacts. Applicant has provided visual simulations depicting the proposed positive impact that the vegetative screening will have for the project.

Additionally, Applicant has already started conversations with the County Emergency Management Agency and will work with the local fire districts to prepare a final Emergency

Response Plan and Catastrophic Incident Coordination and Recovery Plan to further minimize adverse effects on adjacent properties. Applicant has provided a Noise Study (**Exhibit M**) and will meet all Ordinance requirements so as to not create adverse effects. Applicant will work with County and Township road officials to ensure no adverse impacts to roads as a result of the Project. Finally, Applicant has provided a property value assessment from CohnReznick which demonstrates that the Project will not have an adverse effect on adjacent property values.

2. The establishment, maintenance, or operation of the special use shall not be detrimental to or endanger the public health, safety, morals, comfort, or general welfare of the neighboring vicinity.

The establishment, maintenance and operation of the Mackinaw Solar Project will not be detrimental to or endanger the public health, safety, morals, comfort or general welfare of the neighboring vicinity.

The Project's host properties have historically been used for agricultural uses in rural Tazewell County and there is a low population density in the surrounding area. The Project will be constructed, maintained, and operated, in compliance with all local, state and federal regulations, including all requirements for setbacks, fence surrounds and heights, height of panels, and all other Tazewell County ordinance requirements, and will be operated in a safe manner at all times. Applicant has provided a glare study, attached as **Exhibit U** and a noise study, attached as **Exhibit M**, which both contain results that demonstrate there will not be detrimental impacts to the safety or general welfare of the public as a result of the Project due to noise or glare. Applicant has provided extensive detail on the project components to demonstrate that the design of the proposed facility is within accepted professional standards. Applicant has provided reference to NC State University's white paper from May 2017, which confirms that solar farms do not create negative health or safety impacts (**Exhibit R**). Applicant provided a report regarding "Avoided Pollution and Public Health, Ecosystem and Economic Impact" attached as **Exhibit X**, confirming that the Project will offer a net positive outcome by enhancing public health and ecosystem quality. Applicant provided a report regarding Economic Impact, attached as **Exhibit W**, which confirms that the project investment of more than \$600 Million will lead to long term jobs and local earnings for both Tazewell County and the State of Illinois.

Applicant has developed a Vegetation Management Strategies Plan, attached as **Exhibit Q**, reviewing in detail the scope of vegetation included for the project and the maintenance strategies for that vegetation. Related, Applicant has provided extensive details of the dual-use solar/agrivoltaics program that Applicant intends to implement as part of the Project so that agricultural uses remain a consistent and continuing use of the participating parcels.

Applicant has initially consulted with and will continue to work with the local Fire Protection agencies to develop a safety program for the Project and it has developed both a draft Emergency Response Plan attached as **Exhibit T**, and also a Catastrophic Incident Coordination and Recovery Plan also attached as part of **Exhibit T**.

As set forth in the Economic Impact report attached as **Exhibit W**, the Mackinaw Project will create jobs and increase revenues for the community, which will promote the general welfare of the community. Further, benefits to the public from solar energy include enhanced grid stability, lower energy costs, and an opportunity to reduce the amount of energy dependence on fossil fuels and contribute to reduced greenhouse gas emissions.

Finally, the dual-use of solar energy production and agrivoltaics creates a unique opportunity for allowing agricultural land to have continued agricultural purpose while at the same time allowing solar energy generation.

For all of these reasons, as well as though other evidence set forth in the application package submitted by Applicant, the establishment, maintenance and operation of the Mackinaw Project will not be detrimental to or endanger the public health, safety, morals, comfort or general welfare.

3. The special use shall not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted.

The Mackinaw Project will not be injurious to the use and enjoyment of other property in the immediate vicinity for purposes already permitted. The Project is in an area of low population density, adjacent to other agricultural and industrial uses. For the few non-participating residences and/or community buildings near the Project, no detrimental impacts or disruptions are anticipated. The Project will not produce any odors or emit any air pollution, as set forth in the Avoided Pollution Report attached as **Exhibit X**. No injurious impacts from noise are anticipated, as evidenced in the Noise Study, attached as **Exhibit M**. No injurious impacts from glare are anticipated, as evidenced in the Glare Study attached as **Exhibit U**, and further Applicant has committed to installing additional vegetative screening to address any detrimental glare impacts identified after construction. Applicant has completed a Drainage Study, attached as **Exhibit N**, and will adhere to all requirements of the Tazewell County ordinances and the AIMA, attached as **Exhibit G** with respect to drainage. And Applicant has also prepared an initial Stormwater Report (**Exhibit Z**) and will comply with all Tazewell County ordinances related to stormwater management. The proposed Project is a quiet neighbor and a low-impact/passive use to the neighboring land uses which will generally operate in a quiet, passive way that will not interfere with activities on neighboring properties. The only traffic generated is during construction, maintenance and deconstruction and Applicant will work with the road authorities to ensure safe use of all roads. Applicant will work with the County to develop both an acceptable Emergency Response Plan (draft in Exhibit T) as well as a Catastrophic Incident Coordination and Recovery Plan (draft in Exhibit Y). In the event of a catastrophic events that leaves Project debris on neighboring land, Applicant will be responsible for clean-up of all Project debris regardless of where Project debris is found. Accordingly, Applicant submits that the proposed Project will not be injurious to the use and enjoyment of other properties in the immediate vicinity for uses already permitted.

4. The special use shall not substantially diminish and impair property value within the neighborhood.

Applicant engaged CohnReznick to review the Project and prepare a property value impact study, which is attached as **Exhibit V**. This study indicates that comparable solar facilities located in similar areas with similar land uses do not have negative impacts to adjacent real estate and was based on CohnReznick's sales data, on interviews with multiple County Assessors as well as other Market Participants.

While CohnReznick's study is conclusive, Applicant is nevertheless taking measures to mitigate any impacts to nearby landowners, such as installing vegetative screening for all occupied nonparticipating residences within 500 feet of the facility.

5. Adequate utilities, access roads, drainage, and other necessary facilities have been or are being provided.

Adequate utilities, access roads, drainage, and/or other necessary facilities have been or will be provided for the Mackinaw Project. The Project will not require water or sewer facilities to operate. The Mackinaw Project will receive all required approvals to interconnect its facilities and safely connect to the electric grid. The Project will allow for significant quantities of new electric generation to be placed on the grid without the need for significant improvements to the regional electric grid. New and existing roads will be utilized to access the solar facility and Applicant has been and will continue to work with the local road authorities on use of local roads. Applicant has prepared and submitted to all local authorities a Haul Route Map, and has received feedback that use of the proposed roads is reasonable, subject to ongoing discussions and ultimately executed Road Use Agreements with each road authority, which Applicant continues to work on with each road authority. Applicant has prepared a Road Condition Report, attached as **Exhibit L**.

Applicant has undertaken a Drainage Study, attached as **Exhibit N**. In accordance with the Tazewell County Renewable Energy Ordinance and the AIMA, prior to construction a final drainage plan will document drainage infrastructure, identify potential crossings and impacts, and include procedures for repairing damaged subsurface drainage systems in accordance with applicable Illinois drain tile repair standards. All stakeholder outreach and drainage information will be documented, and the final deliverables will provide the County, affected drainage districts, and the Applicant with the information necessary to support compliance with ordinance requirements related to drainage planning, tile identification, repair protocols, and restoration of agricultural drainage systems.

The Project will not materially modify existing water drainage patterns around its facilities. The seed mix of grasses planted under and around the solar arrays will produce a net positive for stormwater absorption and a reduction in erosion and runoff. The Project will be designed to account for all existing features, environmental features, and the Tazewell County Renewable Energy Ordinance. Accordingly, Applicant believes that there are adequate utilities, access roads, drainage and necessary facilities to serve the Project.

6. Adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion and hazard on the public streets.

Applicant is working with relevant road authorities to ensure that adequate measures have been or will be taken to provide ingress and egress to minimize traffic congestion in the public roads. All roads and road entrances necessary to provide adequate access to the solar facility will be provided and have been preliminarily reviewed by the controlling road authority. While there will be an increase in traffic during construction, the Project will generate minimal traffic during operations. Any oversize loads during construction will be approved by the local road authority prior to use of the roads. Applicant has prepared a Road Condition Report, attached as **Exhibit L**. Applicant will prepare a Road Use Agreement with the road authorities and will enter into final Road Use Agreements with each road authority prior to construction. All construction traffic will be properly coordinated with involved jurisdictions to ensure adequate safety measures are taken and traffic congestion is minimized. After the project is constructed, landscape maintenance and maintenance to the project components are anticipated to occur only a few times per year so very limited traffic will be generated after construction is completed.

7. The evidence establishes that granting the use, which is located one-half mile or less from a livestock feeding operation, will not increase the population density around the livestock feeding operation to such levels as would hinder the operation or expansion of such operation.

The Mackinaw Solar Project is not located within one-half mile or less from a livestock feeding operation and also does not seek to establish any residential dwelling units so will not increase the population density. As a result, granting of the special use will not increase the population density around a livestock feeding operation and so will not hinder the operation or expansion of any such operation.

8. Evidence presented establishes that granting the use, which is located more than one-half mile from a livestock feeding operation will not hinder the operation or expansion of such operation.

Once operational, the solar farm is a low-intensity use that will not hinder the operation or expansion of any livestock feeding operation in Tazwell County. Applicant is anticipating that sheep farms and other livestock operations will participate in grazing at the Mackinaw Solar Project which could lead to and support the expansion of livestock farms in the vicinity.

9. Seventy-five percent of the site contains soils having a productivity index of less than 125.

As detailed in the Vegetation Management Strategies Report at **Exhibit Q**, the southern project area's coarse, excessively drained sands rate low, averaging near 91 on the PI scale. The northern project area averages near 107 on the PI scale. All but 1.2 acres of the 3,400 acres included in the Project have a PI of less than 125, making only 0.1% of the Project located on soil having a productivity index of more than 125, and 99.9% of the Project is located on soil having a productivity index of less than 125.

10. The special use is consistent with the existing uses of property within the general area of the property in question.

The properties included in the Project are zoned A-1, CONS, and I-2 which permit the construction of a solar farm as a special use. Properties in the immediately surrounding area will remain zoned A-1, CONS, and I-2. Solar farms are a low intensity use, well-suited for open agricultural areas. The location of the Project will not have an impact on the zoning classification or uses allowed to be developed on surrounding properties. As described above, the project will not produce injurious or detrimental impacts on neighboring properties, as evidenced by the multiple studies and reports attached to the Application, including the results of the Glare Study, the Noise Study, the AIMA, the Drainage Study, the Economic Impact Study, the Avoided Emissions Study, the Vegetation Management Strategies report, and the Property Impact Analysis, among others. The Project will comply with all requirements for setbacks from road rights-of-way, property lines, and non-participating residences/community buildings. Applicant has executed an AIMA and will be required to comply with its terms, including for decommissioning. Applicant will also be required to, and will comply, with all County requirements for decommissioning, including approval of a Decommissioning Plan and placement of financial security with the County to ensure decommissioning costs are covered. For all of these reasons, the Project will be consistent with existing uses of property within the general area of the Project.

11. The suitability of the property in question is for the special use as proposed.

The properties included in the Project are zoned A-1, CONS, and I-2 which permit the construction of a solar farm as a special use and allow agriculture-related businesses. As described, the Project will not only allow for solar energy production, but it will preserve the agricultural character of the land through agrivoltaics. The Project will maintain active agricultural use, including sheep grazing and crop production beneath and around the solar panels, creating a win-win dual use that combines agricultural activities with renewable energy production.

11.0 Sec. 153.04(C)(7) LASALLE/SINCLAIR FACTORS

1. The existing uses and zoning of nearby property.

The properties included in the Project are zoned A-1, CONS, and I-2 which allow construction of a solar farm as a special use. As depicted on **Exhibit C - Figure 2**, the zoning of nearby properties mostly includes A-1 and CONS with some limited R-1 to the east of the Project and one parcel zoned C-2 on the west side of the Project. Existing uses are mostly agricultural with some existing nonparticipating residences near the Project.

2. The extent to which property values are diminished by the particular zoning restrictions.

The Project represents approximately \$600 Million in investment in Tazewell County. The current zoning restrictions do not permit solar farms as a matter of right. This restricts and limits the participating landowners' economic potential if a special use permit is not approved. The participating landowners have determined that solar energy development represents a higher and better use of their property than continued agricultural cultivation, as evidenced by their voluntary participation in the Project. Through long-term agreements with Mackinaw Solar, these landowners will receive greater economic returns than they could achieve through traditional agricultural operations on this land. Moreover, the current agricultural zoning limits the participating properties to a singular use, whereas the proposed dual use agrivoltaics approach, combining solar energy generation with continued agricultural activities such as sheep grazing and crop cultivation beneath and between the panels, expands the range of productive uses for the land and enhances overall property value. Accordingly, the existing zoning restrictions diminish the property values of the Project parcels by preventing the landowners from realizing the full economic potential of their land.

3. The extent to which the destruction of property values of plaintiff promotes the health, safety, morals or general welfare of the public.

Applicant engaged CohnReznick to review the Project and prepare a property value impact study, which is attached as **Exhibit V**. This study indicates that comparable solar facilities located in similar areas with similar land uses do not have negative impacts to adjacent real estate, based on CohnReznick's sales data, on interviews with multiple County Assessors as well as other Market Participants. Accordingly, property values will not be diminished as a result of the Project.

However, to the extent that the Project creates any impact on property values, Applicant also asserts that there is a need for the proposed Project in Tazewell County and that it will promote the health, safety and general welfare of the public. The Project will provide substantial new

electricity-generating capacity, strengthen the reliability and diversity of the regional energy supply, and will help meet growing demand for clean, locally produced power. At the same time, the Project will preserve productive agricultural use through agrivoltaics, provide stable supplemental income to participating families. The project will also create jobs and generate significant long-term tax revenue for local schools and government agencies. All of these opportunities promote the health, safety, and general welfare of the public.

4. The relative gain to the public as compared to the hardship imposed upon the individual property owner.

The public will realize substantial gains from the Project, while any hardship to individual property owners is minimal or non-existent. The participating landowners will benefit directly from long-term lease agreements that provide stable income while allowing continued agricultural use of their land through agrivoltaics. As demonstrated in the CohnReznick property value study (**Exhibit V**), comparable solar facilities do not negatively impact adjacent property values, meaning non-participating neighboring landowners will not suffer economic hardship from the Project.

At the same time, the public gains are significant. The Project represents approximately \$600 Million in capital investment in Tazewell County and will generate substantial long-term tax revenue for local schools, road districts, and government services. The Project will create construction and permanent operations jobs, supporting local employment. The 500 MW of clean energy generation will strengthen regional grid reliability, diversify the energy supply, and help meet growing demand for renewable power, while reducing greenhouse gas emissions, particulate matter and other pollutants. Through the dual use agrivoltaics approach, the Project preserves productive agricultural activity on the land and maintaining the agricultural character of the community. Accordingly, the relative gains weigh heavily in favor of the public. The Project delivers substantial economic, environmental, and energy benefits to Tazewell County, while imposing no demonstrated hardship on individual property owners.

5. The suitability of the subject property for the zoned purpose.

The Project area is suitable for existing agricultural purposes, but the Project's proposed agrivoltaics approach and dual use will preserve and enhance the agricultural use of the land while also allowing for the additional use of solar energy production.

6. The length of time the property has been vacant as zoned considered in the context of the land development in the area in the vicinity of the subject property.

The Project Area has not been vacant. The participating parcels have been used for agricultural purposes, but this does not weigh against the requested special use permit. Rather, the continued agricultural use of the land supports the Project. Unlike a rezoning request where current zoning has rendered land economically unviable or unmarketable, this Application seeks a special use permit that will allow agricultural activity to continue through the agrivoltaics approach while adding the compatible use of solar energy generation. The surrounding land remains rural and agricultural in character and the Project complements this existing context. Solar farms are low-impact uses that are compatible with the agricultural character of the area. The land has been productively used but the Project will allow continued productive use of the land through both solar energy generation and agrivoltaic use.

7. Whether a comprehensive zoning plan for land use and development exists, and whether the ordinance is in harmony with it.

The Project is consistent with the Tazewell County Comprehensive Plan because the proposed Project and solar development generally supports non-traditional agricultural activities, supplements farm income, and provides economic benefits to the County.

Agriculture Principle 3 provides that “non-traditional agricultural activities” should be “supported and allowed to flourish,” including “supplemental uses to supplement farm income and support the financial viability of farms.” Although the Comprehensive Plan does not explicitly mention solar energy, it identifies wind farms as an example of such supplemental uses, finding that “[e]stablishing wind farms at suitable locations will help family farms remain viable.” As the Tazewell County Zoning Board of Appeals has repeatedly found in approved solar SUP cases, the Comprehensive Plan “specifically identifies wind farms but solar farms can also provide a supplementary income” to farmers in Tazewell County. In multiple cases, the Zoning Board of Appeals has found the solar project to be consistent with the Comprehensive Plan.

Here, the Project also advances the Comprehensive Plan’s agriculture goals by preserving the agricultural character of the land through agrivoltaics. The Project will maintain active agricultural use, including sheep grazing and crop production beneath and around the solar panels, creating a win-win dual use that combines agricultural activities with renewable energy production. The Project further provides participating landowners with long-term lease income, supplementing farm income while allowing continued agricultural use of the land.

The Project also provides significant economic benefits to the County, advancing Economic Development Principle 1 of the Comprehensive Plan. Under this Principle, the Comprehensive Plan calls for attracting “new businesses and industries to the County that provide valuable services and fulfill County needs” (Implementation Strategy 2) and for the County to “[p]repare to develop and attract businesses that relate to agriculture” (Implementation Strategy 5).

The Project represents a \$600 million investment in Tazewell County. During construction, the Project will create approximately 600 jobs, both direct and indirect. Once operational, the Project will support 48 permanent positions, including both direct employment and indirect jobs in the local economy. The Project will generate over \$82 million in local taxes over its operational life, averaging \$2.7 million annually, with 72% going to local schools. In addition, Doral’s agrivoltaics program allows agriculture to continue on the land through sheep grazing and crop production, directly advancing the Comprehensive Plan’s call to develop and attract businesses that relate to agriculture. This significant economic contribution, combined with the Project’s support for continued agricultural use, fulfills the Plan’s goals of attracting new businesses that provide valuable services to the County.

8. Whether the community needs the proposed use.

There is a need for the proposed Project in Tazewell County. The Project will provide substantial new electricity-generating capacity, strengthen the reliability and diversity of the regional energy supply, and will help meet growing demand for clean, locally produced power. At the same time, the Project will preserve productive agricultural use through agrivoltaics, provide stable supplemental income to participating families. The project will also create jobs and generate significant long term tax revenue for local schools and government agencies.

12.0 CONCLUSION

Pending approval by Tazewell County, Applicant is ready to bring the Mackinaw Solar Project to construction and operation within three years. The Project is a 500 MW Commercial Solar Energy Facility located primarily on agricultural use parcels in Tazewell County. The construction phase of the Project will create hundreds of direct, indirect, and induced jobs. Throughout its expected 35-year life span, the Mackinaw Solar Project is expected to generate approximately \$82 million in revenue to Tazewell County, applicable local school districts, and other local taxing authorities. The Project brings these economic and environmental benefits with little disturbance to the County or to neighboring properties. Furthermore, the dual use of agrivoltaics and solar facility will preserve productive agricultural uses of the land and, at the end of the life of the Project, the land can be restored again to fully agricultural or natural land use. As an owner-operator, Applicant is ready to be a long-term contributor to Tazewell County. The County and the community can count on Applicant to live up to its sterling reputation for professionalism, safety, environmental stewardship, and community engagement.

The Applicant submits that the Special Use Permit application materials for the Mackinaw Solar Project satisfy (or will satisfy) all requirements set forth in the Tazewell County Ordinances, and all other applicable state and federal regulatory requirements. Applicant, therefore, respectfully requests that Tazewell County grant Mackinaw Solar LLC a Special Use Permit for the construction, maintenance, and operation of the Mackinaw Solar Project as a Commercial Solar Energy Facility.

Special Use Permit Application
Mackinaw Solar LLC

Exhibit A
Special Use Permit Application

*****Application included above.**

Exhibit B

Organizational Information

***** Some Items not include in the ZBA
Packet due to space restrictions. Do not
hesitate to contact the office if this you
wish to review this item.**

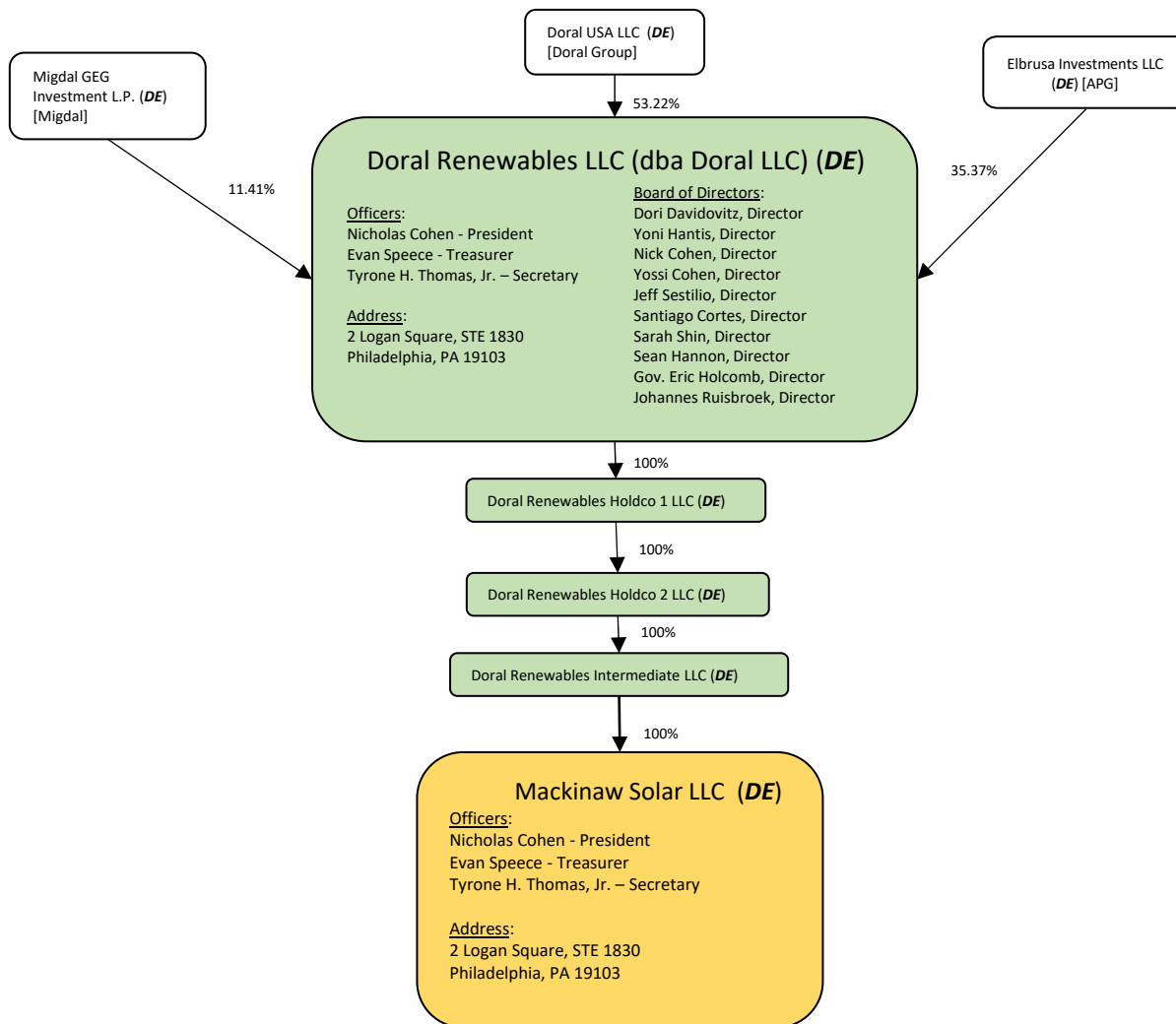


Exhibit C
Figures

U:\190319031903103_data\gis_cad\gis\ArcPro\Mackinaw Solar\Mackinaw Solar.aprx Revised: 2026-08-11 By: djbilin

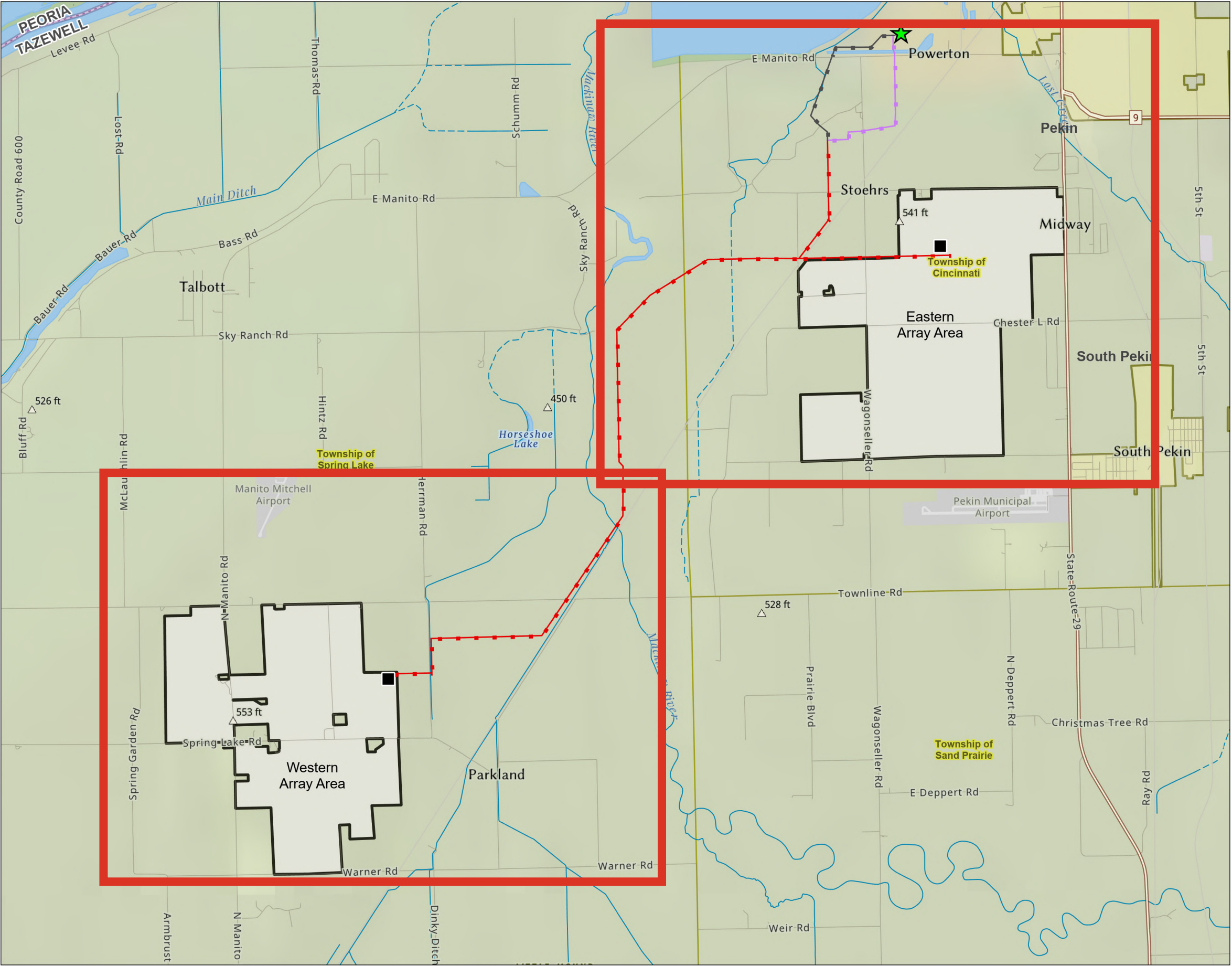
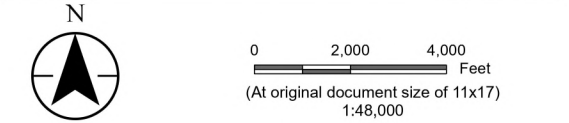


Figure No. 1
Title Overview Map

Client/Project Mackinaw Solar LLC
Mackinaw Solar Project 190319031

Project Location Tazewell County, Illinois Prepared by DJG on 2026-07-29
TR by MN on 2026-07-31
IR by CP on 2026-08-11



- Legend
- ★ Point of Interconnection
 - Project Substation
 - Proposed Gen-Tie Route
 - Route Alternative 1
 - Route Alternative 2
 - ▭ Solar Project Area
 - ▭ Township (USGS)
 - ▭ Incorporated Place (US Census Bureau)



MACKINAW SOLAR
by DORAL LLC



Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Stantec, Esri, USCB, USGS
3. Background: National Geographic



U:\1903190310031003_data\gis_cad\gis\ArcPro\TazewellSolar\Mackinaw Solar.aprx Revised: 2026-08-11 By: djbilin

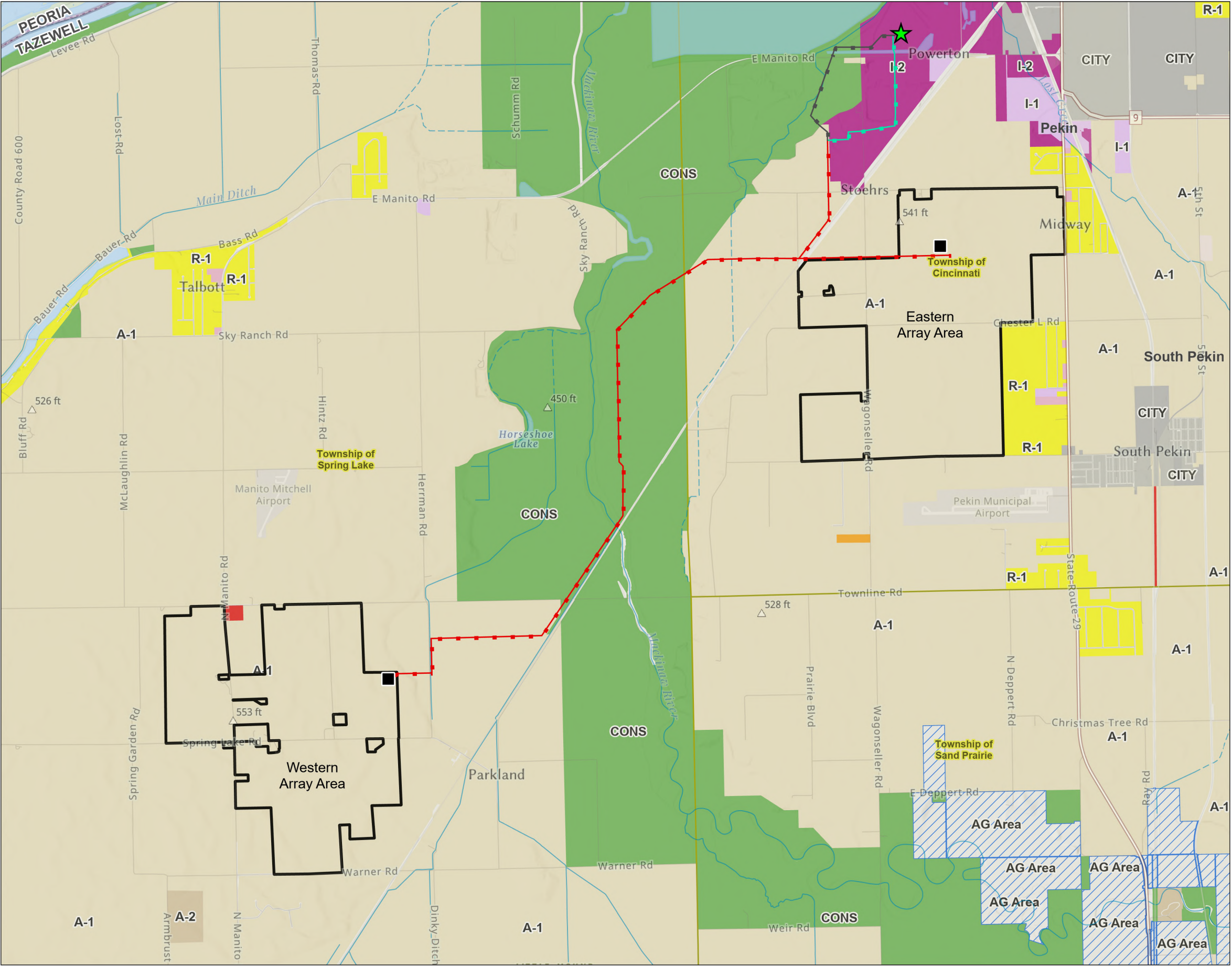
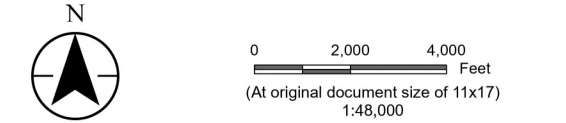


Figure No. **2**
Title **Tazewell County Zoning Map**

Client/Project **Mackinaw Solar LLC
Mackinaw Solar Project** 190319031

Project Location **Tazewell County,
Illinois** Prepared by DJG on 2026-08-03
TR by MN on 2026-08-03
IR by CP on 2026-08-11

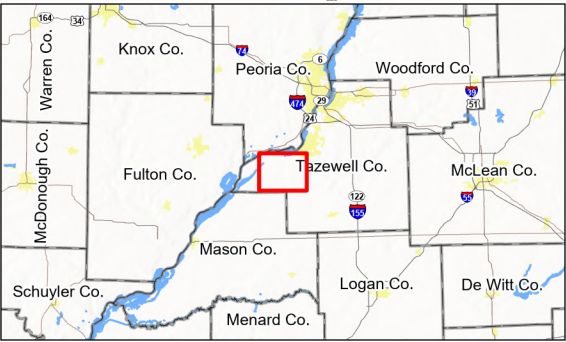


- Legend
- ★ Point of Interconnection
 - Project Substation
 - Proposed Gen-Tie Route
 - Route Alternative 1
 - Route Alternative 2
 - ▭ Solar Project Area
- Tazewell County Zoning Districts

- AG Area
- A-1
- A-2
- C-1
- C-2
- CITY
- CONS
- I-1
- I-2
- R-1
- R-R



MACKINAW SOLAR
by DORAL LLC



Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Tazewell County, Stantec, Esri, USCB, USGS
3. Background: National Geographic



U:\190319031903103_data\gis_cad\gis\ArcPro\Map\Map\Mackinaw Solar.aprx Revised: 2026-08-11 By: djbilin

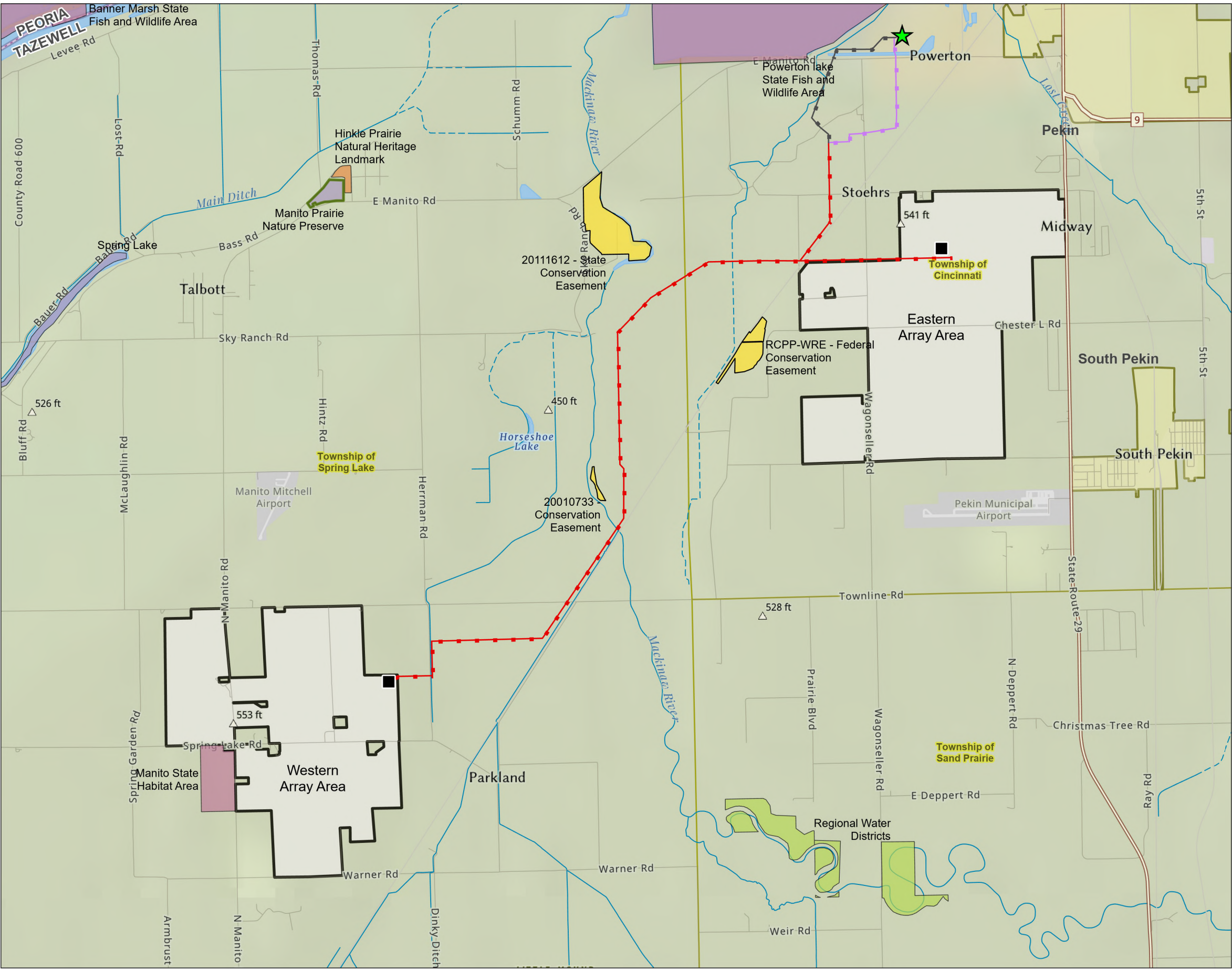
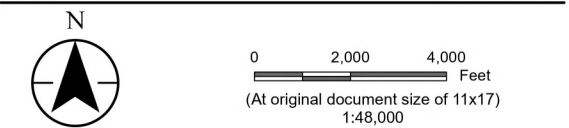


Figure No. **3**
Title **Protected Lands Map**

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-07-29
TR by MN on 2026-07-31
IR by CP on 2026-08-11



- Legend
- ★ Point of Interconnection
 - Project Substation
 - Proposed Gen-Tie Route
 - Route Alternative 1
 - Route Alternative 2
 - ▭ Solar Project Area
 - ▭ Illinois Nature Preserve Commission
 - ▭ I-View Public Sector Protected Lands
- Protected Areas Database - US
- ▭ State Trust Land
 - ▭ Other State (NHP, DOT, HS, etc.)
 - ▭ County / Regional Agency Land
 - ▭ Private Conservation; Private Corporation
 - ▭ Township (USGS)
 - ▭ Incorporated Place (US Census Bureau)



MACKINAW SOLAR
by DORAL LLC



Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Stantec, Prairie State Conservation Coalition (INPC), Esri, USCB, USGS
3. Background: National Geographic



Exhibit D

List of Participating Landowners

***** Items not include in the ZBA Packet
due to space restrictions. You can find
owner information in the Legal Notice.**

Exhibit E
Site Plan

Stantec
10000 MIDLANTIC DR SUITE 300W
MOUNT LAUREL, NJ 08054
WWW.STANTEC.COM

TITLE SHEET & PROJECT INFORMATION

MACKINAW SOLAR
TAZEWELL COUNTY, IL

NO.	REVISION	DATE
-----	----------	------

RAVN	MJM
------	-----

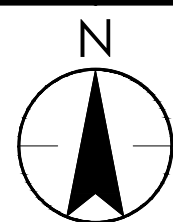
DESIGNED MJM

CHECKED	JMI

BOJ NO	190319031
--------	-----------

SHEET NUMBER

G0 01



LOCATION MAP

NO SCALE

APPLICANTS	
DEVELOPER:	MACKINAW SOLAR LLC
Primary Contact	CHRIS PEKAR
	2 LOGAN SQUARE, SUITE 1830
	PHILADELPHIA, PA 19103
	608-345-5213
	CPEKAR@DORAL-LLC.COM
ENGINEER:	STANTEC CONSULTING SERVICES INC.
Primary Contact	MATT CLEMENTI, P.E.
	12308 CORPORATE PKWY
	MEQUON, WI 53092
	262-617-9113
	MATT.CLEMENTI@STANTEC.COM



REFERENCED FILES						
DESCRIPTION	FILE NAME	DATE RECEIVED	INSERTION	DATE GENERATED	ORIGINATED BY	COMMENTS
EXISTING SURFACE	190319031-DS-C-EGRAD.dwg		0,0,0	8/6/2026	STANTEC CONSULTING SERVICES INC.	
EXISTING CONDITIONS	190319031-XR-C-ESITE.dwg		0,0,0	3/31/2026	STANTEC CONSULTING SERVICES INC.	
LAYOUT	190319031_Mackinaw_PV_Layout.dwg		0,0,0	3/31/2026	STANTEC CONSULTING SERVICES INC.	

The locations of existing utility installations as shown on this plan are approximate. There may be other underground utility installations within the project area that are not shown.

Stantec assumes no responsibility for damages, liability or costs resulting from changes or alterations made to this plan without written consent of Stantec.

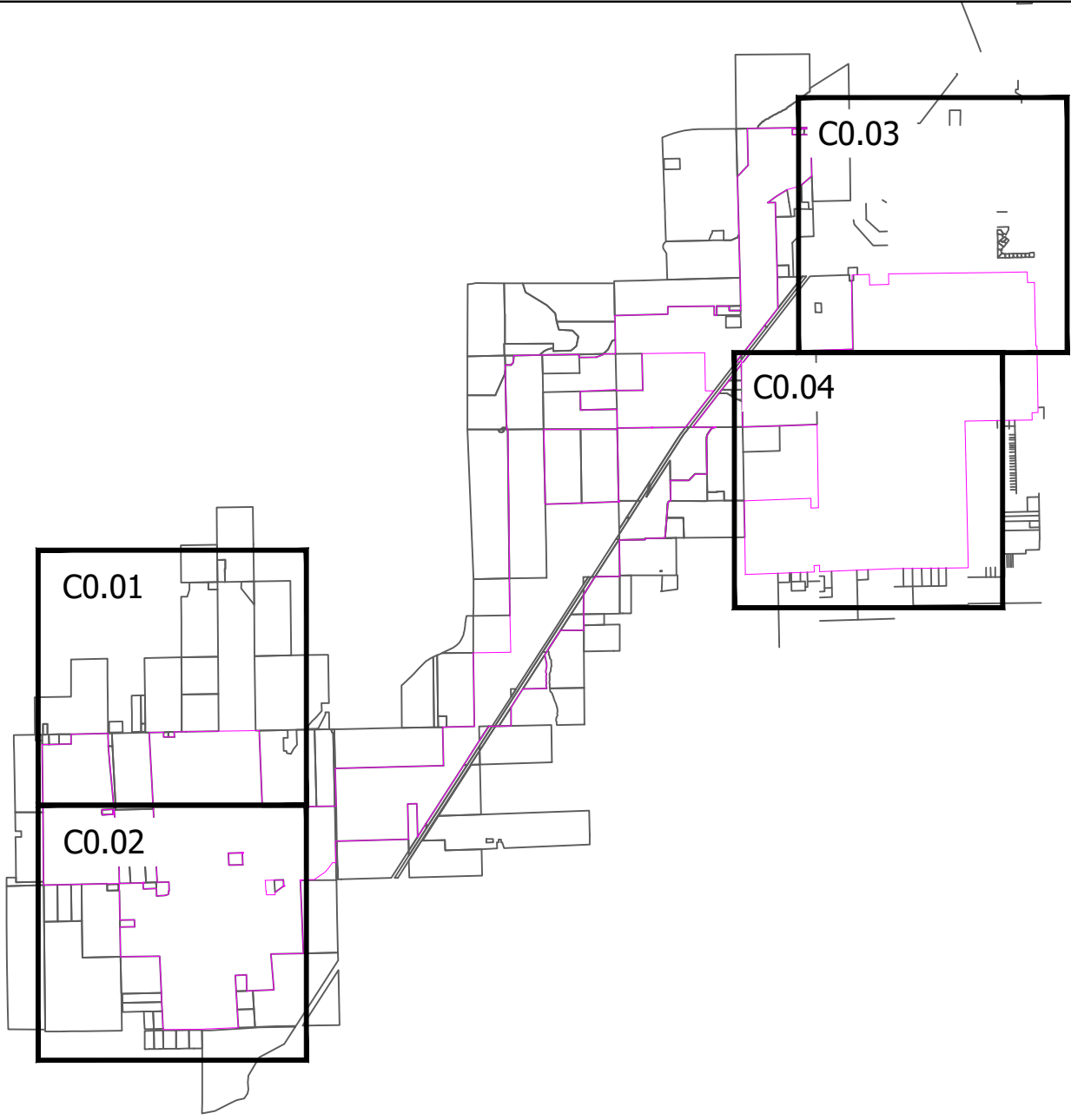
These drawings have been prepared based on information provided by others. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result.

THIS DRAWING FOR ALL TERMS AND RESPONSIBILITY FOR ALL DIMENSIONS DO NOT SCALE THE DRAWING. THE COMPANY OR ENGINEER HAS NOT BEEN ADVISED OF ANY CHANGES TO THE PROJECT. THE COMPANY OR ENGINEER HAS NOT BEEN ADVISED OF ANY CHANGES TO THE PROJECT. THE COMPANY OR ENGINEER HAS NOT BEEN ADVISED OF ANY CHANGES TO THE PROJECT.

C:\Users\jmcody\Documents\Stantec Consulting\190319031_Mackinaw_Solar\Project Files\4. jmcody\190319031_C010.dwg

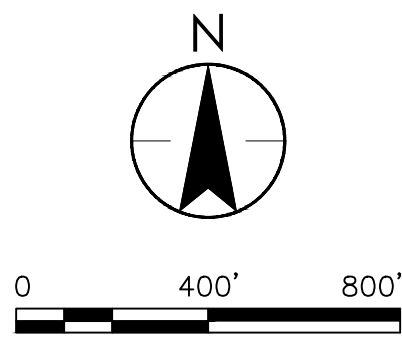


KEY MAP

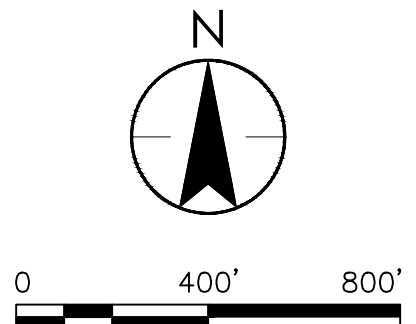


LEGEND
EXISTING

- PROJECT AREA
- PROJECT PARCEL BOUNDARY
- ADJACENT PROPERTY LINE
- BUILDING
- ROAD EDGE
- ROAD CENTERLINE
- TREE LINE
- OVERHEAD ELECTRICAL TRANSMISSION LINE
- RAILROAD
- UNDERGROUND COMMUNICATION LINE
- UNDERGROUND GAS LINE
- UNDERGROUND WATER LINE
- UNDERGROUND FIBER OPTIC LINE
- DELINEATED STREAM
- CULTURAL RESOURCE AREA
- DELINEATED WETLAND
- FEMA FLOOD ZONE AE
- FEMA REGULATORY FLOODWAY
- FEMA FLOOD ZONE B
- FEMA REDUCED RISK AREA
- EXISTING DRAIN TILE
- ET
- ET
- 440
- 442
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- CONSTRAINTS
- 50' IRRIGATION WELL BUFFER
- 35' FEMA FLOODPLAIN BUFFER
- 50' WETLAND BUFFER
- 50' PROPERTY SETBACK
- 50' ROW PROPERTY SETBACK
- 150' BUILDING BUFFER
- 50' CULTURAL SETBACK
- 35' EXISTING UTILITY SETBACK



C:\Users\jmcclroy\DC\ACCDocs\Stantec Consulting\190319031_Mackinaw_Solar\Project Files\4_sheets\190319031_C010.dwg



- | LEGEND | |
|---|---------------------------------------|
|  | PROJECT AREA |
|  | PROJECT PARCEL BOUNDARY |
|  | ADJACENT PROPERTY LINE |
|  | BUILDING |
|  | ROAD EDGE |
|  | ROAD CENTERLINE |
|  | TREE LINE |
|  | OVERHEAD ELECTRICAL TRANSMISSION LINE |
|  | RAILROAD |
|  | UNDERGROUND COMMUNICATION LINE |
|  | UNDERGROUND GAS LINE |
|  | UNDERGROUND WATER LINE |
|  | UNDERGROUND FIBER OPTIC LINE |
|  | DELINEATED STREAM |
|  | CULTURAL RESOURCE AREA |
|  | DELINEATED WETLAND |
|  | FEMA FLOOD ZONE AE |
|  | FEMA REGULATORY FLOODWAY |
|  | FEMA FLOOD ZONE B |
|  | FEMA REDUCED RISK AREA |
|  | EXISTING DRAIN TILE |
|  | HISTORICAL DRAIN TILE |
|  | EXISTING MAJOR CONTOUR |
|  | EXISTING MINOR CONTOUR |
|  | CONSTRAINTS |
|  | 50' IRRIGATION WELL BUFFER |
|  | 35' FEMA FLOODPLAIN BUFFER |
|  | 50' WETLAND BUFFER |
|  | 50' PROPERTY SETBACK |
|  | 50' ROW PROPERTY SETBACK |
|  | 150' BUILDING BUFFER |
|  | 50' CULTURAL SETBACK |
|  | 35' EXISTING UTILITY SETBACK |

PRELIMINARY
NOT FOR CONSTRUCTION

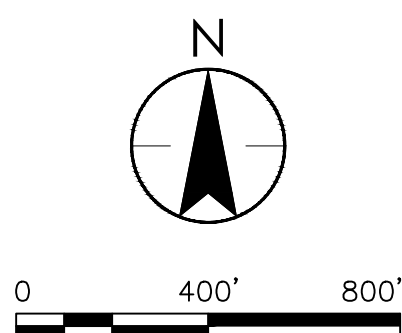
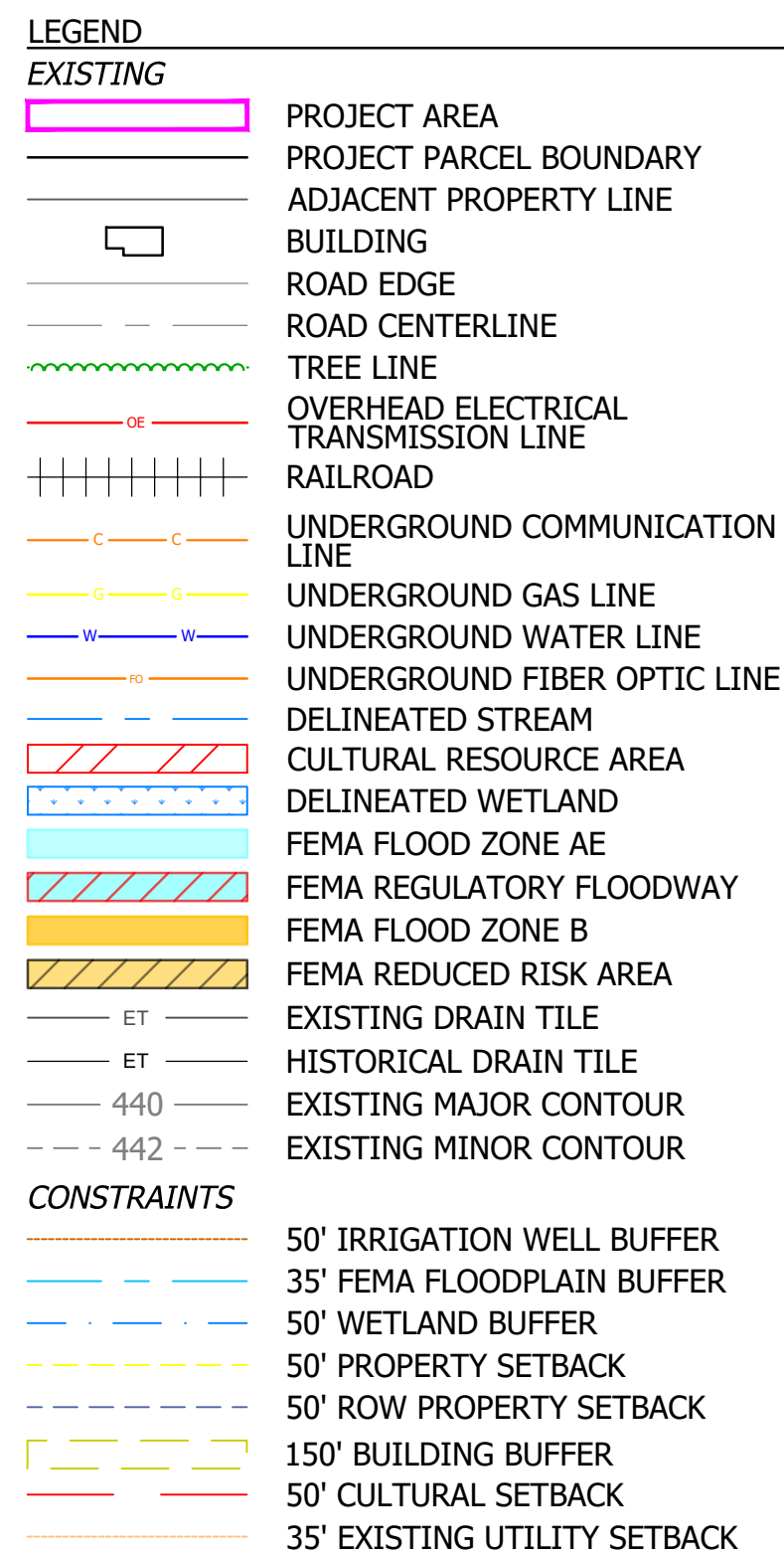
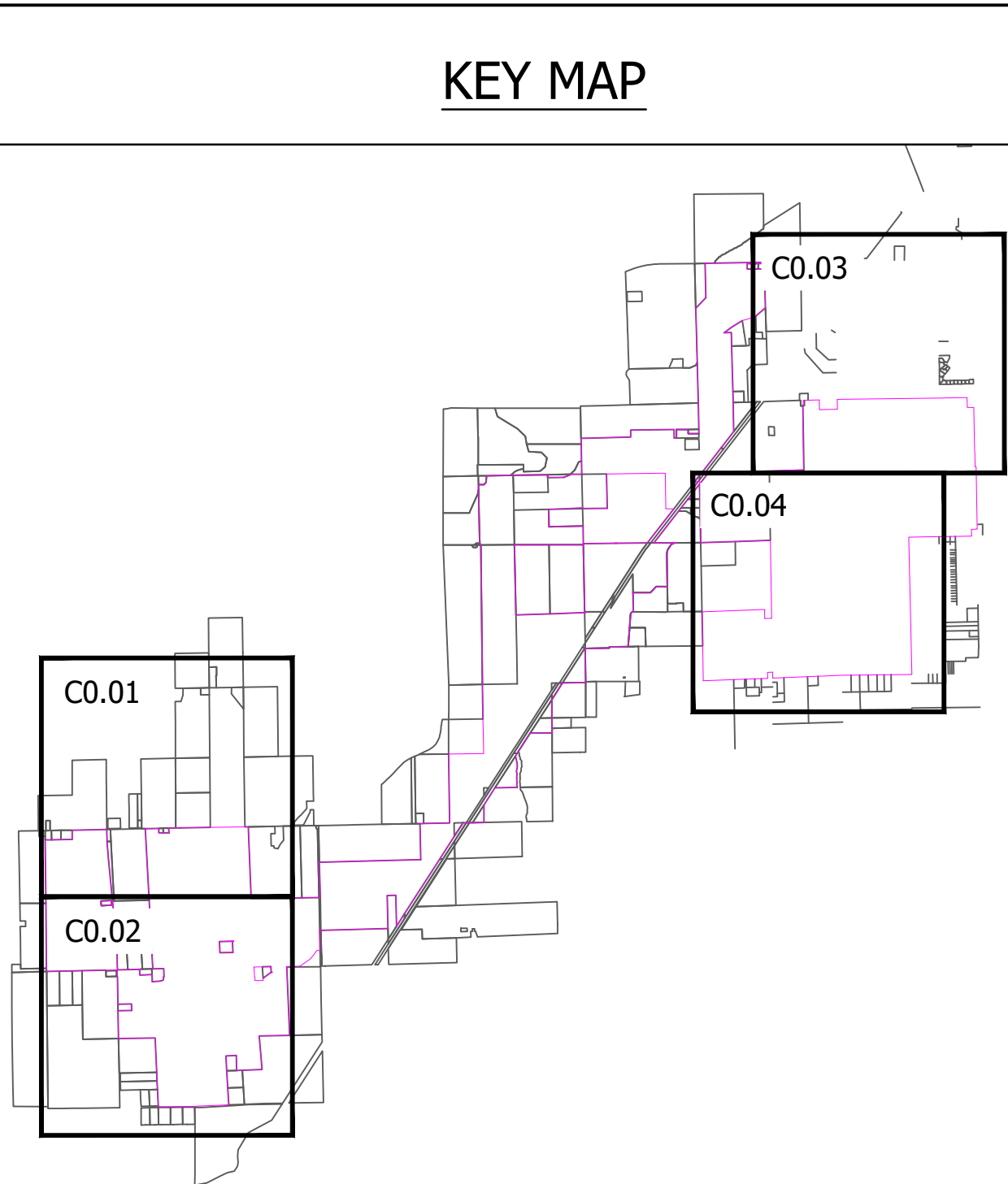
EXISTING CONDITIONS

MACKINAW SOLAR
TAYZELL COUNTY, IL

ISSUED: CUP APP 8/20/2026		
NO.	REVISION	DATE
DRAWN	MJM	
DESIGNED	MJM	
CHECKED	JMT	
APPROVED	JMC	
PROJ. NO.	190319031	
SHEET NUMBER		
C0.02		



\\Users\jmcclroy\DC\ACCDocs\Stanlec Consulting\190319031_Mackinaw_Solar\Project Files\4_sheets\190319031_C010.dwg



KEY MAP

Stantec
10000 MIDLANTIC DR SUITE 300W
MOUNT LAUREL, NJ 08054
WWW.STANTEC.COM

PRELIMINARY
NOT FOR CONSTRUCTION

EXISTING CONDITIONS

MACKINAW SOLAR
TAYEWELL COUNTY II

ISSUED: CUP APP
8/20/2026

NO.	REVISION	DATE
-----	----------	------

RAVN MJM

DESIGNED MJM

CHECKED JMT

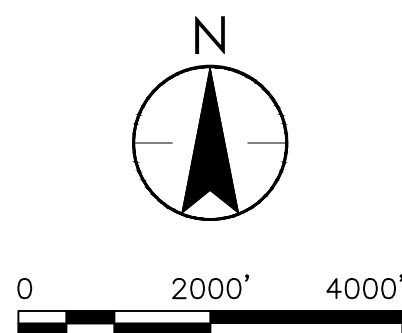
APPROVED JMC

COJ. NO. 190319031

SHEET NUMBER

CO 04

C:\Users\jmcclory\DC\ACCDocs\Stantec Consulting\190319031_Mackinaw_Solar\Project Files\4_sheets\190319031_C100.dwg



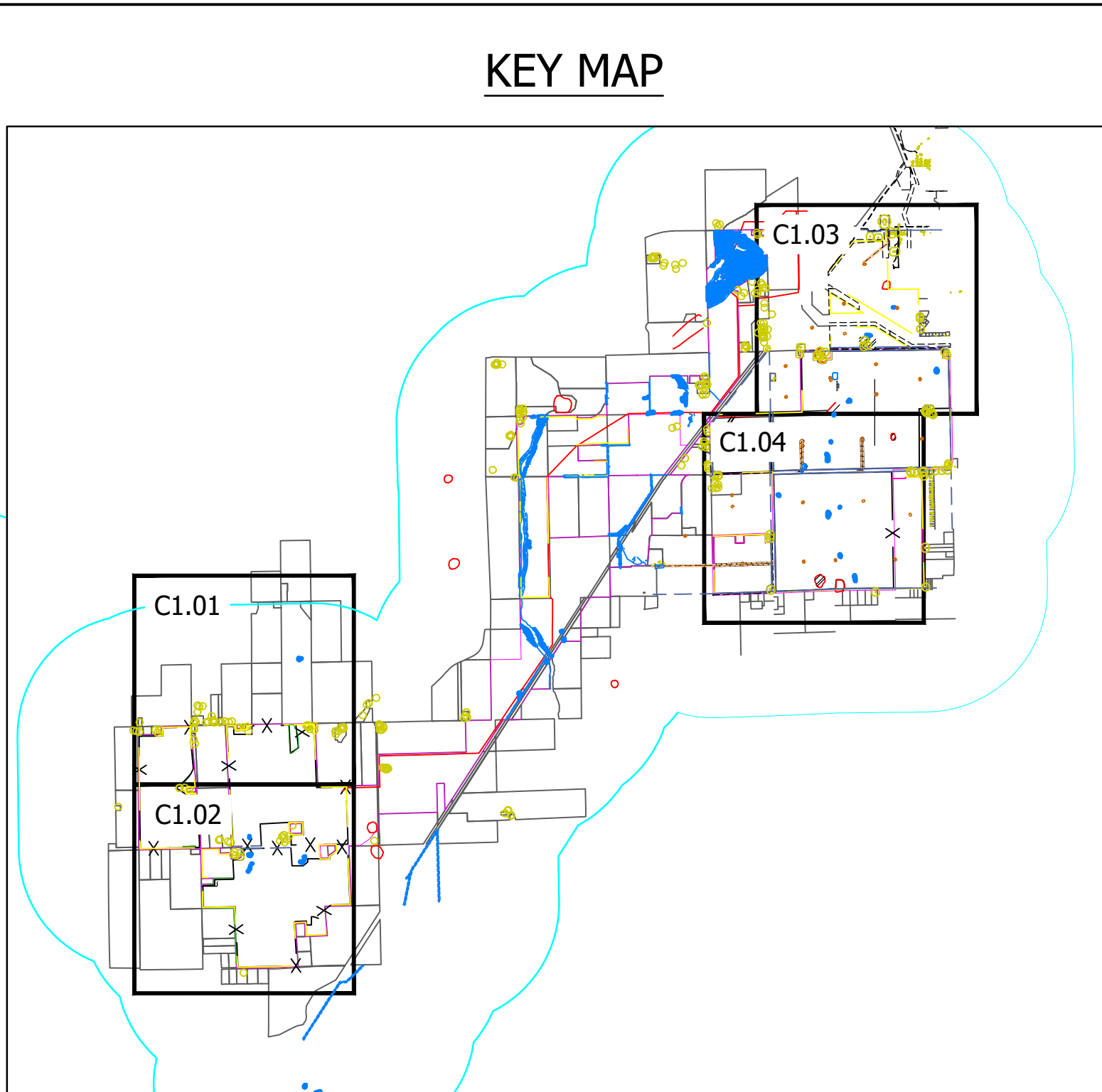
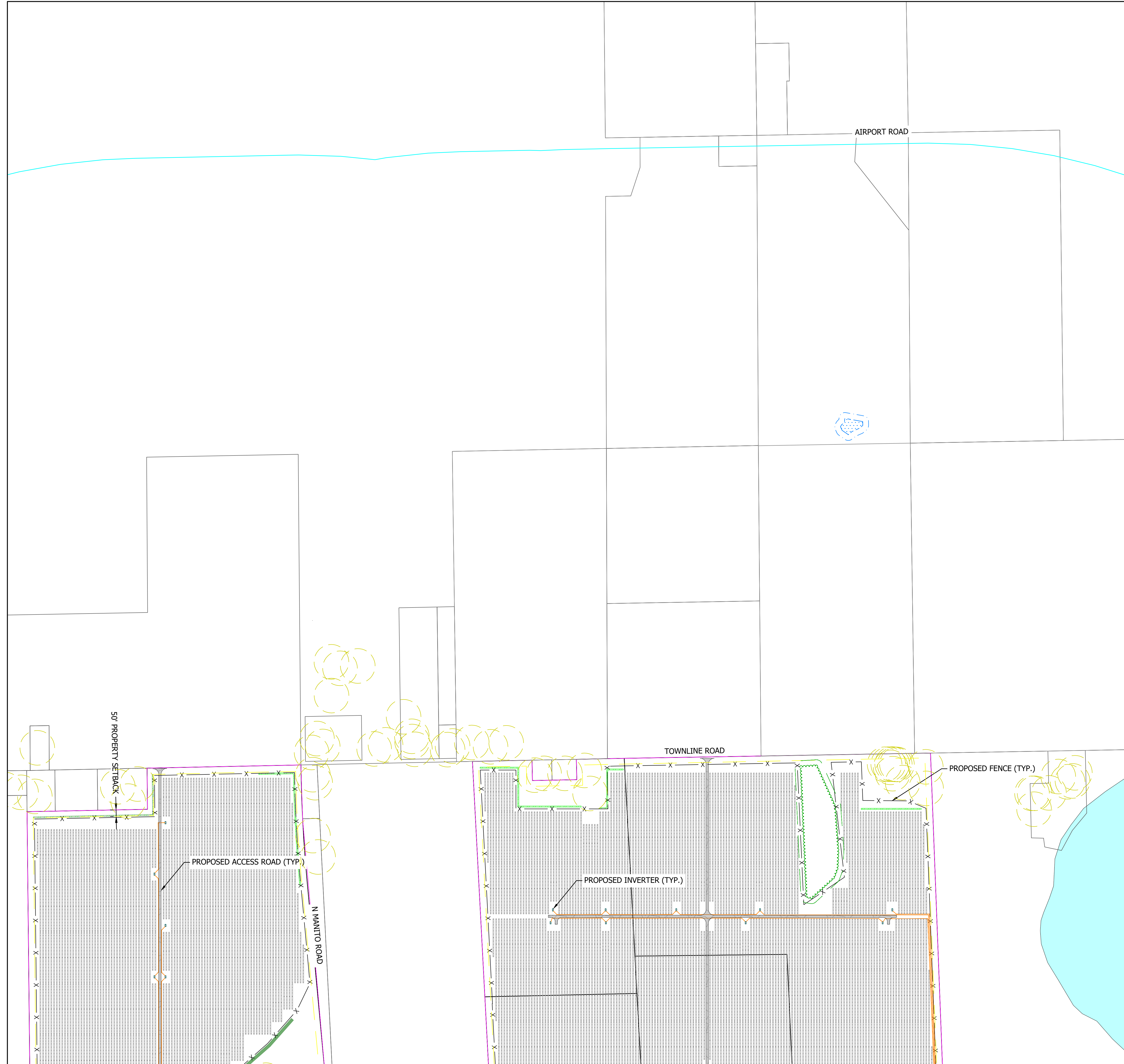
Stantec
10000 MIDLANTIC DR SUITE 300W
MOUNT LAUREL, NJ 08054
WWW.STANTEC.COM

OVERALL SITE PLAN

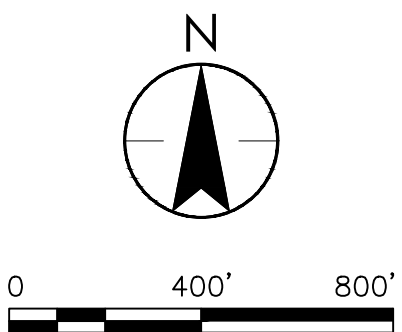
MACKINAW SOLAR
TAZEWELL COUNTY, IL

ISSUED: CUP APP 8/20/2026		
NO.	REVISION	DATE
DRAWN	MJM	
DESIGNED	MJM	
CHECKED	JMT	
APPROVED	JMC	
PROJ. NO.	190319031	
SHEET NUMBER		
C1.00		

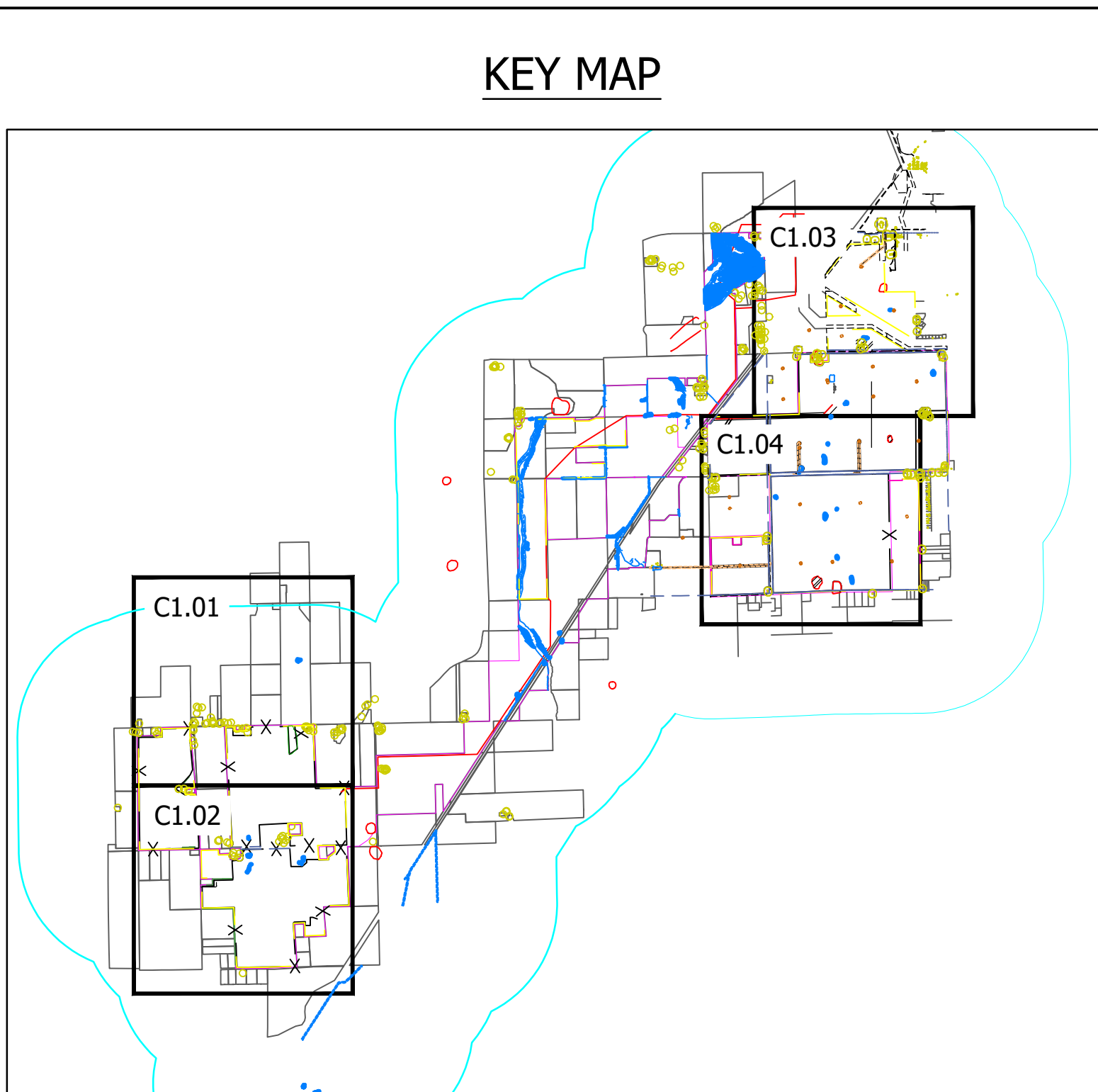
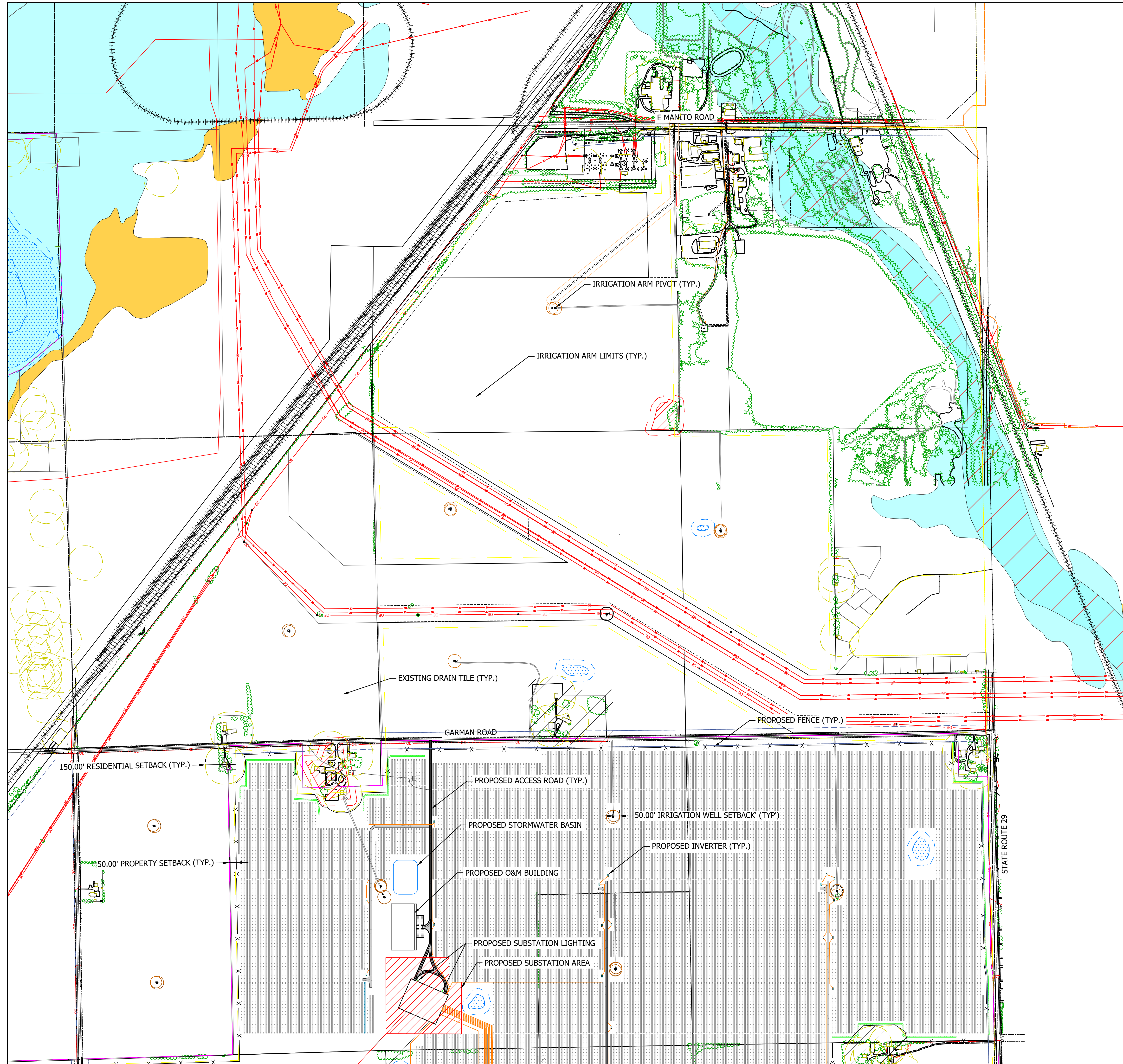
C:\Users\jmcclory\DC\ACCDocs\Stantec Consulting\190319031_Mackinaw_Solar\Project Files\4 sheets\190319031_C100.dwg



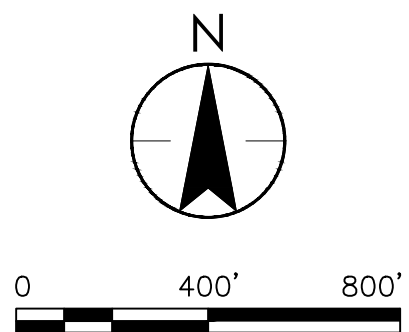
- | LEGEND | |
|--------------------|------------------------------------|
| EXISTING | |
| | PROJECT AREA |
| | PROJECT PARCEL BOUNDARY |
| | ADJACENT PROPERTY LINE |
| | BUILDING |
| | ROAD EDGE |
| | ROAD CENTERLINE |
| | TREE LINE |
| | OVERHEAD ELECTRICAL |
| | TRANSMISSION LINE |
| | RAILROAD |
| | UNDERGROUND COMMUNICATION LINE |
| | UNDERGROUND GAS LINE |
| | UNDERGROUND WATER LINE |
| | UNDERGROUND FIBER OPTIC LINE |
| | UNDERGROUND FIBER OPTIC LINE |
| | DELINEATED STREAM |
| | CULTURAL RESOURCE AREA |
| | DELINEATED WETLAND |
| | FEMA FLOOD ZONE AE |
| | FEMA REGULATORY FLOODWAY |
| | FEMA FLOOD ZONE B |
| | FEMA REDUCED RISK AREA |
| | EXISTING DRAIN TILE |
| CONSTRAINTS | |
| | 50' IRRIGATION WELL BUFFER |
| | 35' FEMA FLOODPLAIN BUFFER |
| | 50' WETLAND BUFFER |
| | 50' PROPERTY SETBACK |
| | 50' ROW PROPERTY SETBACK |
| | 150' BUILDING BUFFER |
| | 50' CULTURAL SETBACK |
| | 35' EXISTING UTILITY SETBACK |
| PROPOSED | |
| | WILDLIFE FENCE |
| | PVCASE TRACKERS |
| | INVERTS |
| | ACCESS ROAD |
| | UNDERGROUND ELECTRIC |
| | GEN-TIE LINE |
| | SUBSTATION |
| | VEGETATIVE SCREENING |
| | EX. VEGETATIVE SCREENING TO REMAIN |



C:\Users\jmcclory\DC\ACCDocs\Stantec Consulting\190319031_Mackinaw_Solar\Project Files\4_sheets\190319031_C100.dwg

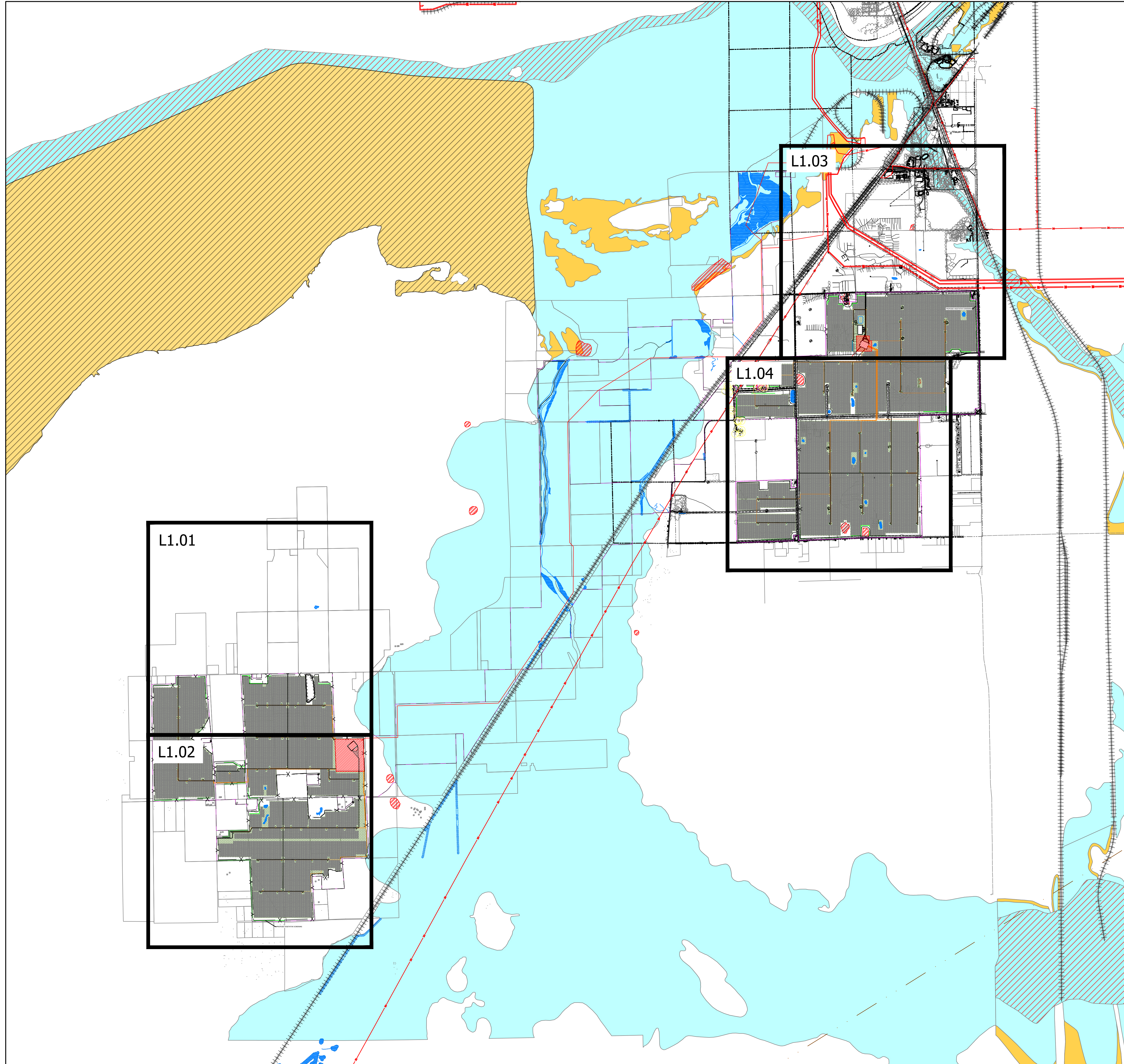


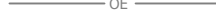
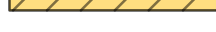
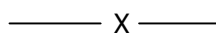
- | LEGEND | |
|--------------------|------------------------------------|
| EXISTING | |
| | PROJECT AREA |
| | PROJECT PARCEL BOUNDARY |
| | ADJACENT PROPERTY LINE |
| | BUILDING |
| | ROAD EDGE |
| | ROAD CENTERLINE |
| | TREE LINE |
| | OVERHEAD ELECTRICAL |
| | TRANSMISSION LINE |
| | RAILROAD |
| | UNDERGROUND COMMUNICATION LINE |
| | UNDERGROUND GAS LINE |
| | UNDERGROUND WATER LINE |
| | UNDERGROUND FIBER OPTIC LINE |
| | UNDERGROUND FIBER OPTIC LINE |
| | DELINEATED STREAM |
| | CULTURAL RESOURCE AREA |
| | DELINEATED WETLAND |
| | FEMA FLOOD ZONE AE |
| | FEMA REGULATORY FLOODWAY |
| | FEMA FLOOD ZONE B |
| | FEMA REDUCED RISK AREA |
| | EXISTING DRAIN TILE |
| CONSTRAINTS | |
| | 50' IRRIGATION WELL BUFFER |
| | 35' FEMA FLOODPLAIN BUFFER |
| | 50' WETLAND BUFFER |
| | 50' PROPERTY SETBACK |
| | 50' ROW PROPERTY SETBACK |
| | 150' BUILDING BUFFER |
| | 50' CULTURAL SETBACK |
| | 35' EXISTING UTILITY SETBACK |
| PROPOSED | |
| | WILDLIFE FENCE |
| | PVCASE TRACKERS |
| | INVERTS |
| | ACCESS ROAD |
| | UNDERGROUND ELECTRIC |
| | GEN-TIE LINE |
| | SUBSTATION |
| | VEGETATIVE SCREENING |
| | EX. VEGETATIVE SCREENING TO REMAIN |

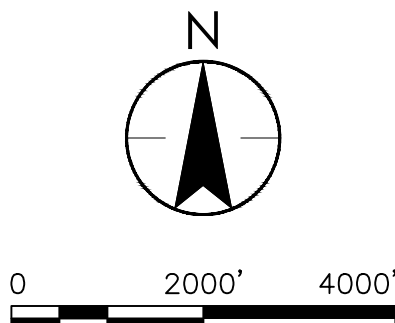


 Stantec 10000 MIDLANDIC DR SUITE 300W MOUNT LAUREL, NJ 08054 WWW.STANTEC.COM		
PRELIMINARY NOT FOR CONSTRUCTION		
SITE PLAN MACKINAW SOLAR TAZEVELL COUNTY, IL		
ISSUED: CUP APP 8/20/2026		
NO.	REVISION	DATE
DRAWN	MJM	
DESIGNED	MJM	
CHECKED	JMT	
APPROVED	JMC	
PROJ. NO.	190319031	
SHEET NUMBER		
C1.03		

C:\Users\jmcclory\DC\ACCDocs\Stantec Consulting\190319031_Mackinaw Solar\Project Files\4_sheets\190319031_L100.dwg



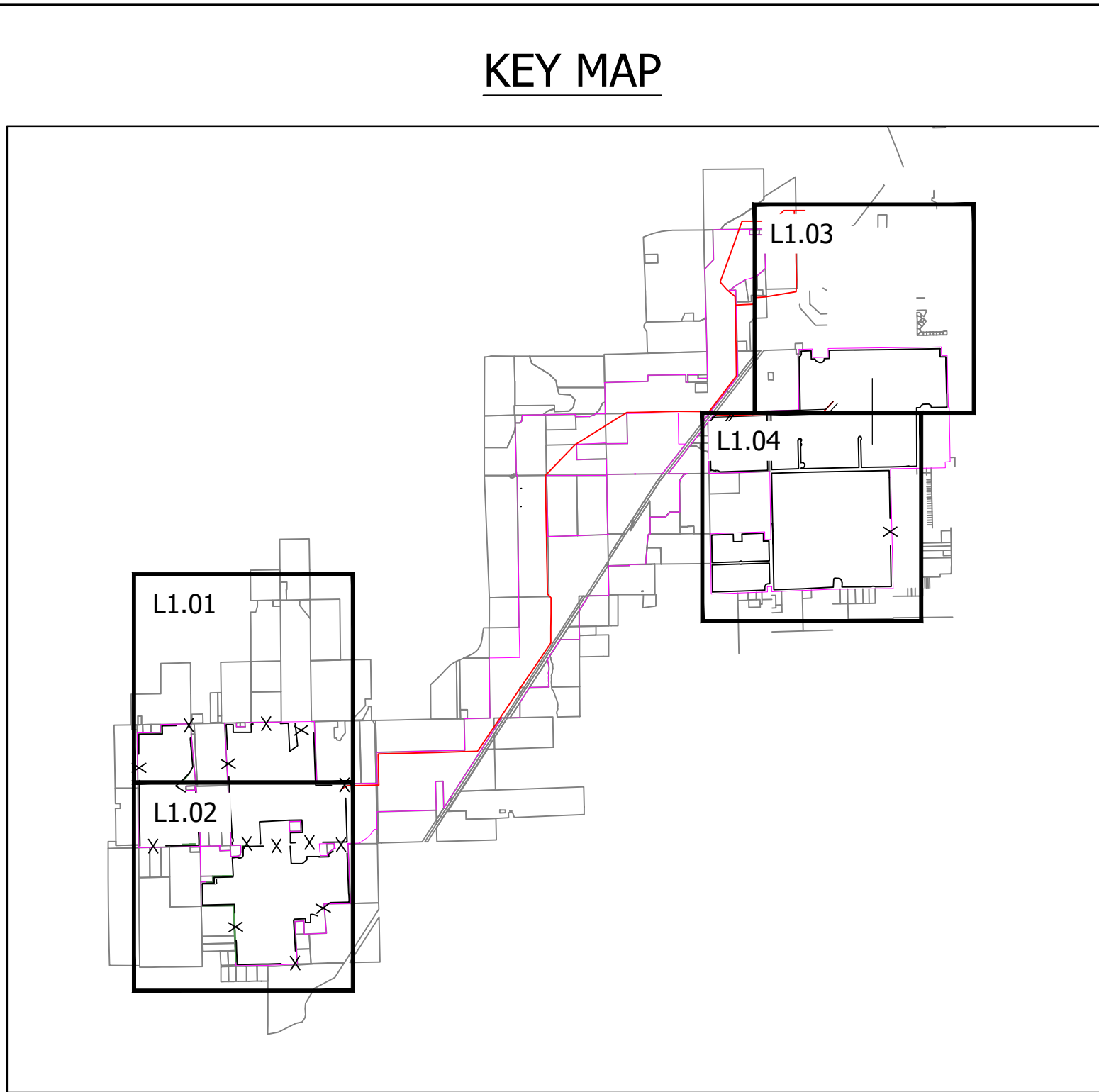
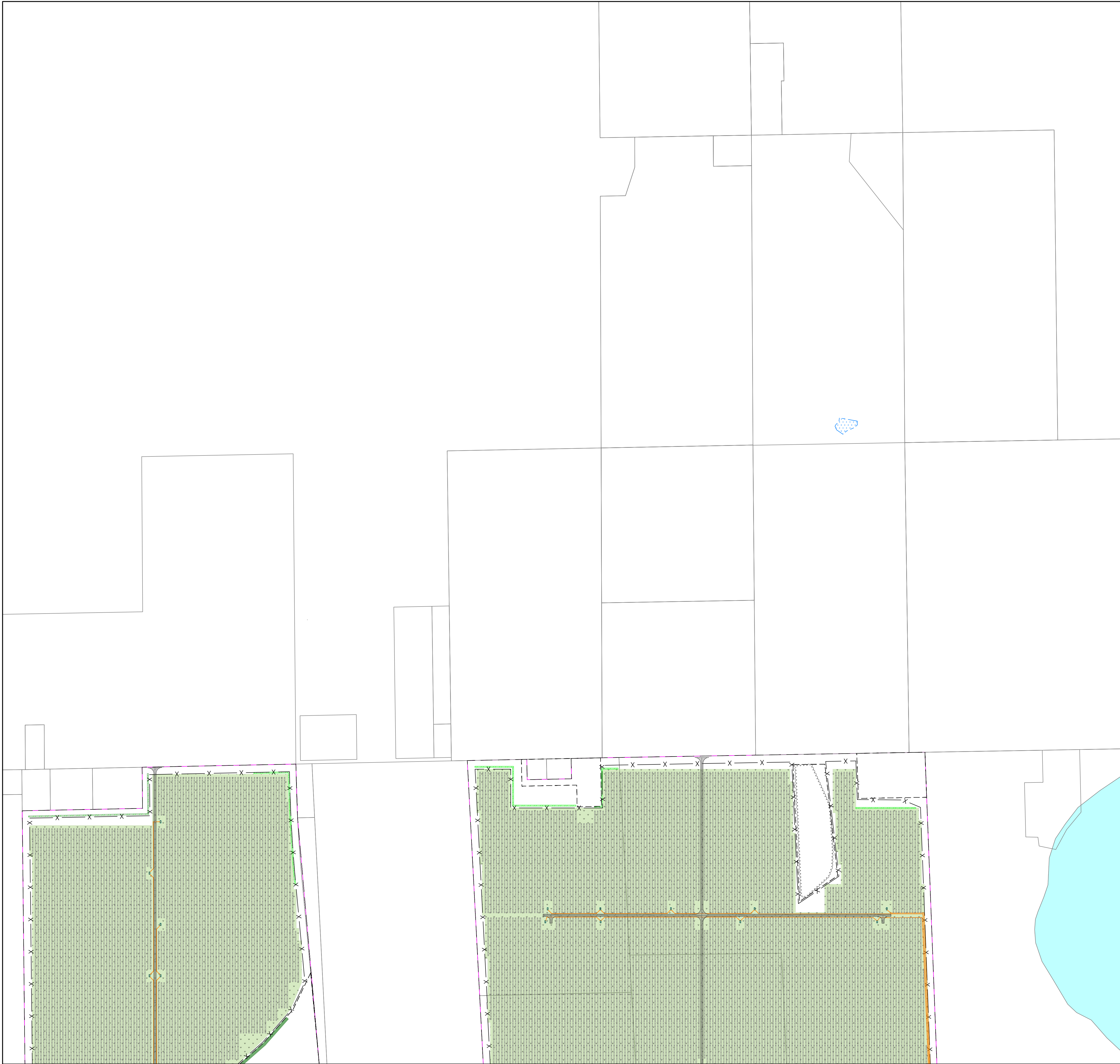
- | | |
|---|---------------------------------------|
| LEGEND | |
| EXISTING | |
|  | PROJECT AREA |
|  | PROJECT PARCEL BOUNDARY |
|  | ADJACENT PROPERTY LINE |
|  | BUILDING |
|  | ROAD EDGE |
|  | ROAD CENTERLINE |
|  | TREE LINE |
|  | OVERHEAD ELECTRICAL TRANSMISSION LINE |
|  | RAILROAD |
|  | UNDERGROUND COMMUNICATION LINE |
|  | UNDERGROUND GAS LINE |
|  | UNDERGROUND WATER LINE |
|  | UNDERGROUND FIBER OPTIC LINE |
|  | DELINEATED STREAM |
|  | CULTURAL RESOURCE AREA |
|  | DELINEATED WETLAND |
|  | FEMA FLOOD ZONE AE |
|  | FEMA REGULATORY FLOODWAY |
|  | FEMA FLOOD ZONE B |
|  | FEMA REDUCED RISK AREA |
|  | EXISTING DRAIN TILE |
|  | HISTORICAL DRAIN TILE |
| PROPOSED | |
|  | WILDLIFE FENCE |
|  | PVCASE TRACKERS |
|  | INVERTERS |
|  | ACCESS ROAD |
|  | UNDERGROUND ELECTRIC |
|  | GEN-TIE LINE |
|  | SUBSTATION |
|  | VEGETATIVE SCREENING |
|  | EX. VEGETATIVE SCREENING TO REMAIN |
|  | SEED MIX - SEE VEG. MANAGEMENT PLAN |



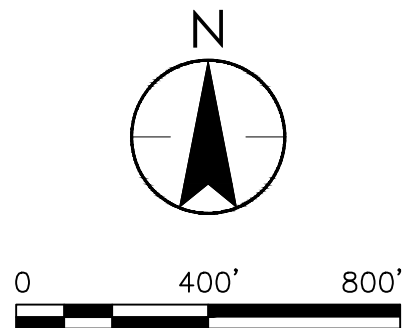
 Stantec 10000 MIDLANDIC DR SUITE 300W MOUNT LAUREL, NJ 08054 WWW.STANTEC.COM		
PRELIMINARY NOT FOR CONSTRUCTION		
OVERALL LANDSCAPE PLAN MACKINAW SOLAR TAEWEELL COUNTY, IL		
ISSUED: CUP APP 8/20/2026		
NO.	REVISION	DATE
DRAWN	NJM	
DESIGNED	NJM	
CHECKED	JMT	
APPROVED	JMC	
PROJ. NO.	190319031	
SHEET NUMBER L1.00		

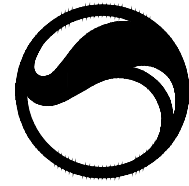
THIS DRAWING FOR ALL PERMITS AND RESPONSES FOR ALL DISREGARD. DO NOT SCALE THE DRAWING. THE COPY RIGHTS TO ALL DESIGN AND DRAWINGS ARE THE PROPERTY OF STANTEC. REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY STANTEC IS FORBIDDEN.

C:\Users\jmcody\Documents\Stantec Consulting\190319031_Mackinaw_Solar Project Plan_4.dwg 1/20/2026 11:00:00 AM



- LEGEND**
- EXISTING**
- PROJECT AREA
 - PROJECT PARCEL BOUNDARY
 - ADJACENT PROPERTY LINE
 - BUILDING
 - ROAD EDGE
 - ROAD CENTERLINE
 - TREE LINE
 - OVERHEAD ELECTRICAL TRANSMISSION LINE
 - RAILROAD
 - UNDERGROUND COMMUNICATION LINE
 - UNDERGROUND GAS LINE
 - UNDERGROUND WATER LINE
 - UNDERGROUND FIBER OPTIC LINE
 - DELINEATED STREAM
 - CULTURAL RESOURCE AREA
 - DELINEATED WETLAND
 - FEMA FLOOD ZONE AE
 - FEMA REGULATORY FLOODWAY
 - FEMA FLOOD ZONE B
 - FEMA REDUCED RISK AREA
 - EXISTING DRAIN TILE
 - HISTORICAL DRAIN TILE
- PROPOSED**
- WILDLIFE FENCE
 - PVCASE TRACKERS
 - INVERTERS
 - ACCESS ROAD
 - UNDERGROUND ELECTRIC
 - GEN-TIE LINE
 - SUBSTATION
 - VEGETATIVE SCREENING
 - EX. VEGETATIVE SCREENING TO REMAIN
 - SEED MIX - SEE VEG. MANAGEMENT PLAN





10000 MIDLAND DR SUITE 300W
MOUNT LAUREL, NJ 08054
WWW.STANTEC.COM

PRELIMINARY
NOT FOR CONSTRUCTION

LANDSCAPE PLAN
MACKINAW SOLAR
TAEWELL COUNTY, IL

ISSUED: CUP APP
8/20/2026

NO. REVISION DATE

DRAWN MJM

DESIGNED MJM

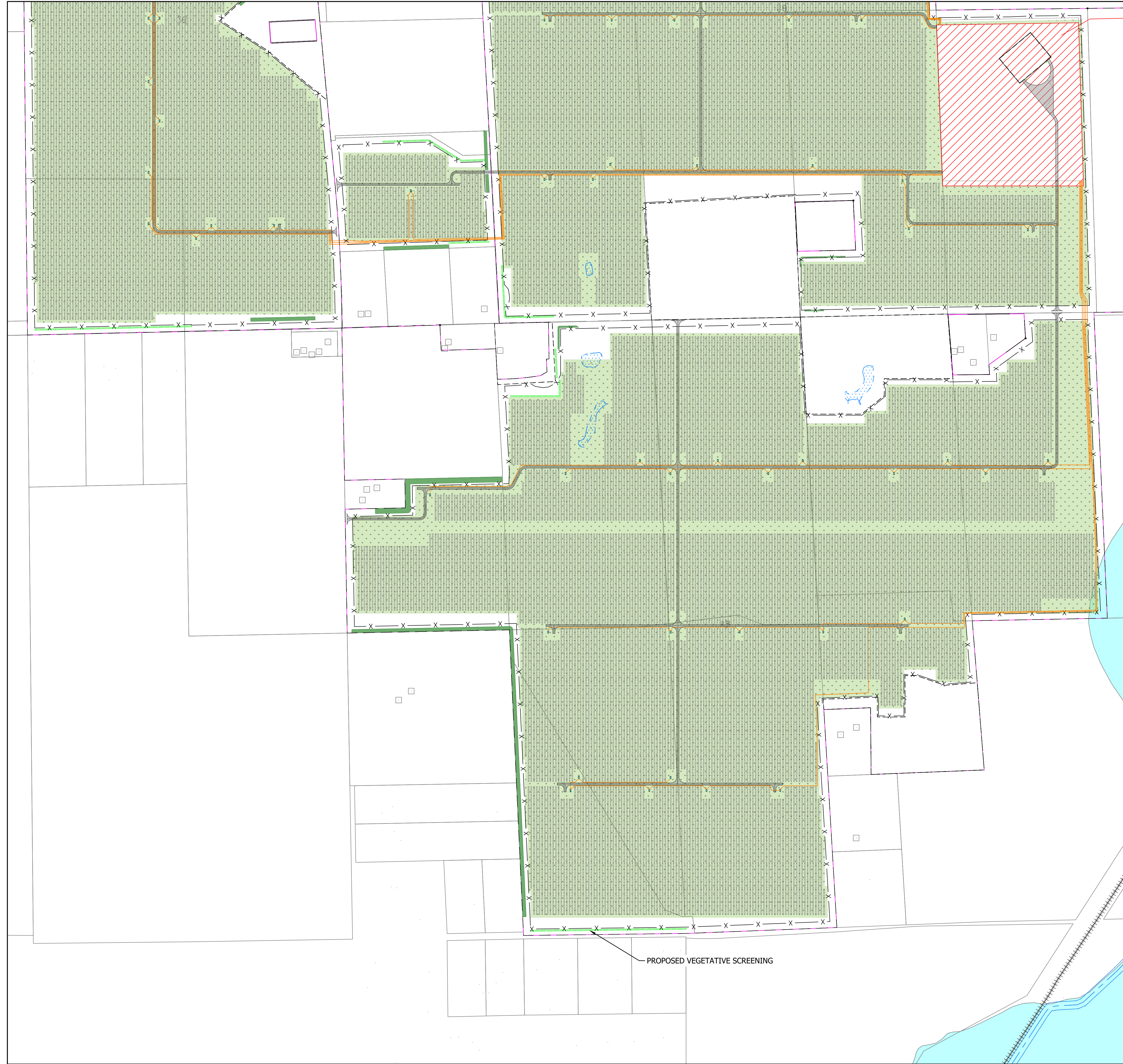
CHECKED JMT

APPROVED JMC

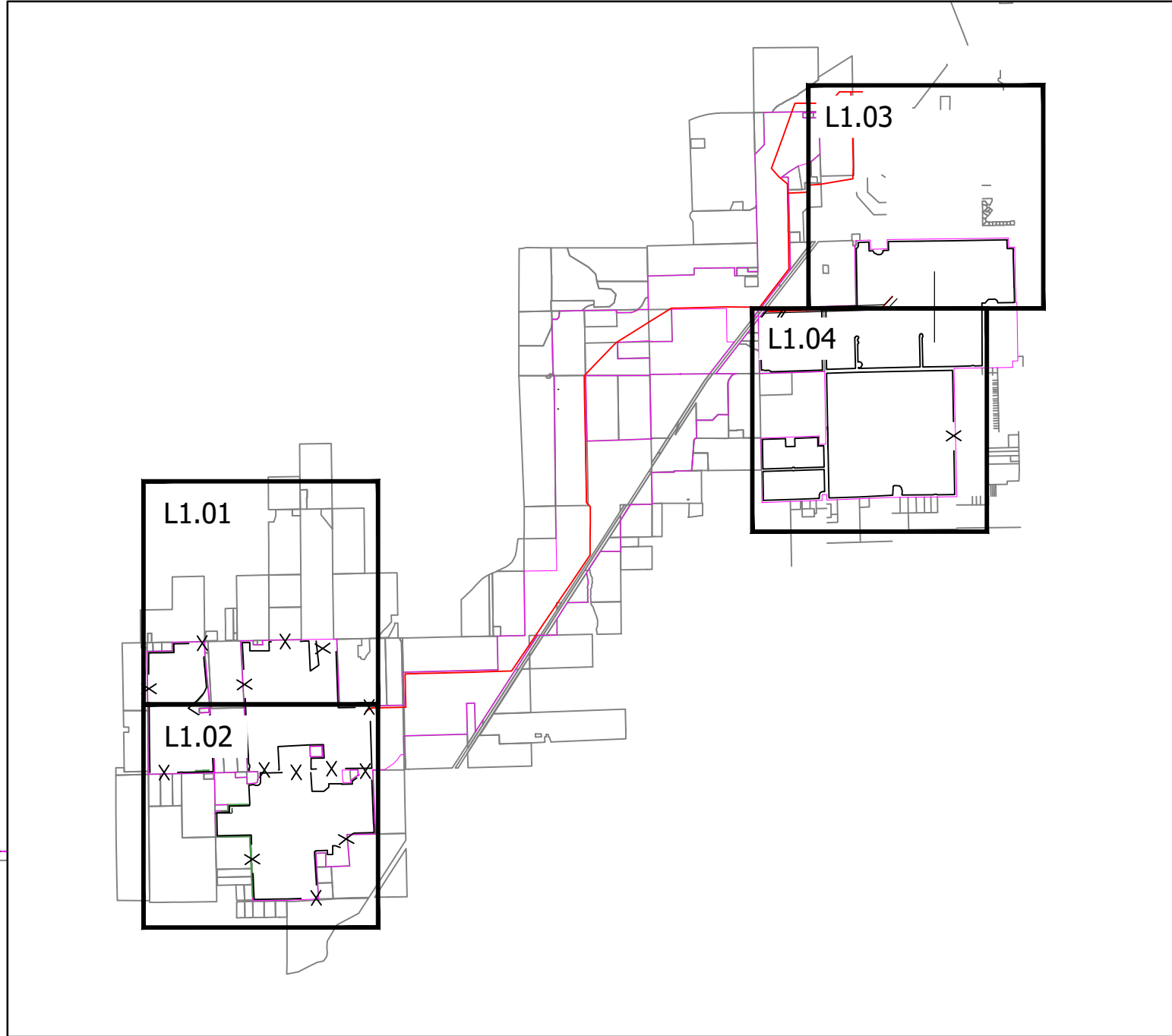
PROJ. NO. 190319031

SHEET NUMBER
L1.01

C:\Users\jmcclory\DC\ACCDocs\Stantec Consulting\190319031_Mackinaw Solar\Project Files\4 sheets\190319031_L100.dwg

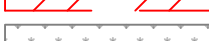
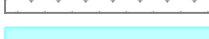
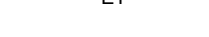
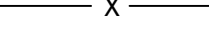


KEY MAP



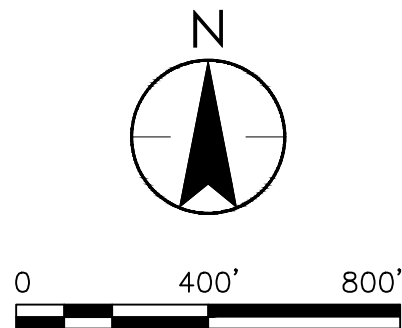
LEGEND

EXISTING

- | | |
|---|---------------------------------------|
|  | PROJECT AREA |
|  | PROJECT PARCEL BOUNDARY |
|  | ADJACENT PROPERTY LINE |
|  | BUILDING |
|  | ROAD EDGE |
|  | ROAD CENTERLINE |
|  | TREE LINE |
|  | OVERHEAD ELECTRICAL TRANSMISSION LINE |
|  | RAILROAD |
|  | UNDERGROUND COMMUNICATION LINE |
|  | UNDERGROUND GAS LINE |
|  | UNDERGROUND WATER LINE |
|  | UNDERGROUND FIBER OPTIC LINE |
|  | DELINEATED STREAM |
|  | CULTURAL RESOURCE AREA |
|  | DELINEATED WETLAND |
|  | FEMA FLOOD ZONE AE |
|  | FEMA REGULATORY FLOODWAY |
|  | FEMA FLOOD ZONE B |
|  | FEMA REDUCED RISK AREA |
|  | EXISTING DRAIN TILE |
|  | HISTORICAL DRAIN TILE |
| PROPOSED | |
|  | WILDLIFE FENCE |
|  | PVCACE TRACKERS |
|  | INVERTERS |
|  | ACCESS ROAD |
|  | UNDERGROUND ELECTRIC |
|  | GEN-TIE LINE |
|  | SUBSTATION |
|  | VEGETATIVE SCREENING |
|  | EX. VEGETATIVE SCREENING TO REMAIN |
|  | SEED MIX - SEE VEG. MANAGEMENT PLAN |

PROPOS

-  WILDLIFE FENCE
-  PVCASE TRACKERS
-  INVERTERS
-  ACCESS ROAD
-  UNDERGROUND ELECTRIC
-  GEN-TIE LINE
-  SUBSTATION
-  VEGETATIVE SCREENING
-  EX. VEGETATIVE SCREENING TO REMAIN
-  SEED MIX - SEE VEG. MANAGEMENT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION

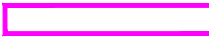
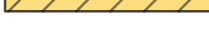
LANDSCAPE PLAN

MACKINAW SOLAR
TAZEWELL COUNTY, IL

ISSUED: CUP APP 8/20/2026		
NO.	REVISION	DATE
DRAWN	MJM	
DESIGNED	MJM	
CHECKED	JMT	
APPROVED	JMC	
PROJ. NO.	190319031	
SHEET NUMBER L1.02		

LEGEND

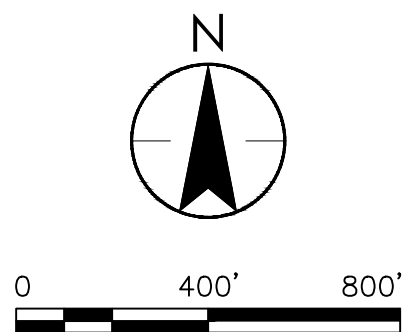
EXISTING

- | | |
|---|---------------------------------------|
|  | PROJECT AREA |
|  | PROJECT PARCEL BOUNDARY |
|  | ADJACENT PROPERTY LINE |
|  | BUILDING |
|  | ROAD EDGE |
|  | ROAD CENTERLINE |
|  | TREE LINE |
|  | OVERHEAD ELECTRICAL TRANSMISSION LINE |
|  | RAILROAD |
|  | UNDERGROUND COMMUNICATION LINE |
|  | UNDERGROUND GAS LINE |
|  | UNDERGROUND WATER LINE |
|  | UNDERGROUND FIBER OPTIC LINE |
|  | DELINEATED STREAM |
|  | CULTURAL RESOURCE AREA |
|  | DELINEATED WETLAND |
|  | FEMA FLOOD ZONE AE |
|  | FEMA REGULATORY FLOODWAY |
|  | FEMA FLOOD ZONE B |
|  | FEMA REDUCED RISK AREA |
|  | EXISTING DRAIN TILE |
|  | HISTORICAL DRAIN TILE |
| PROPOSED | |
|  | WILDLIFE FENCE |
|  | PVCACE TRACKERS |
|  | INVERTERS |
|  | ACCESS ROAD |
|  | UNDERGROUND ELECTRIC |
|  | GEN-TIE LINE |
|  | SUBSTATION |
|  | VEGETATIVE SCREENING |
|  | EX. VEGETATIVE SCREENING TO REMAIN |
|  | SEED MIX - SEE VEG. MANAGEMENT PLAN |

PROPOSE

-
- X — WILDLIFE FENCE
 — PVCASE TRACKERS
 — INVERTERS
 ACCESS ROAD
 — UNDERGROUND ELECTRIC
 — GEN-TIE LINE
 — SUBSTATION
 — VEGETATIVE SCREENING
 — EX. VEGETATIVE SCREENING TO REMAIN
 — SEED MIX - SEE VEG. MANAGEMENT PLAN

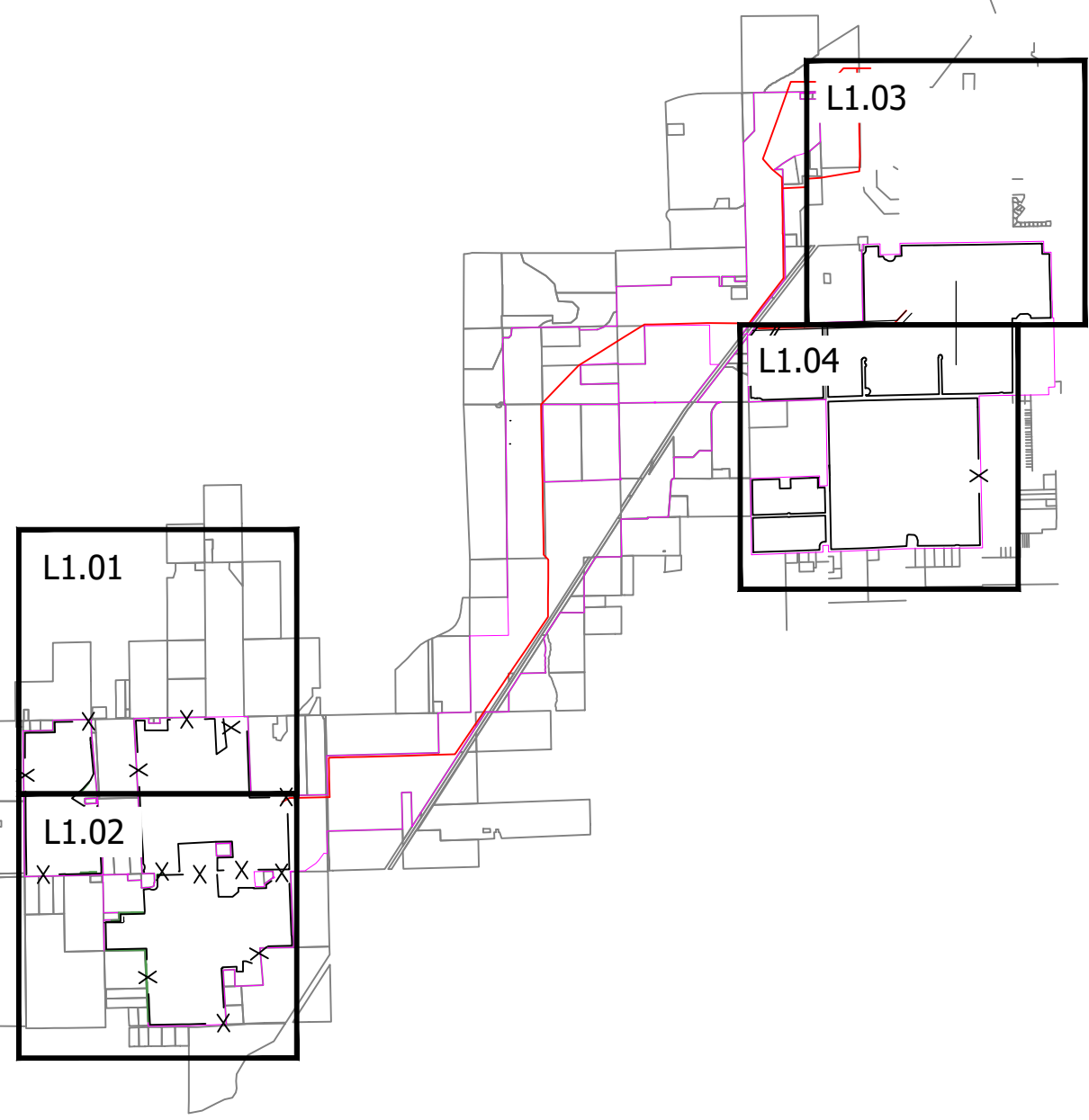
PROPOSED VEGETATIVE SCREENING



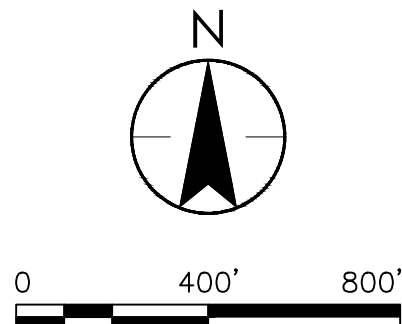
C:\Users\jmcclory\DC\ACCDocs\Stantec Consulting\190319031_Mackinaw Solar\Project Files\4 sheets\190319031_L100.dwg



KEY MAP



- | LEGEND | |
|-----------------|---------------------------------------|
| EXISTING | |
| | PROJECT AREA |
| | PROJECT PARCEL BOUNDARY |
| | ADJACENT PROPERTY LINE |
| | BUILDING |
| | ROAD EDGE |
| | ROAD CENTERLINE |
| | TREE LINE |
| | OVERHEAD ELECTRICAL TRANSMISSION LINE |
| | RAILROAD |
| | UNDERGROUND COMMUNICATION LINE |
| | UNDERGROUND GAS LINE |
| | UNDERGROUND WATER LINE |
| | UNDERGROUND FIBER OPTIC LINE |
| | DELINEATED STREAM |
| | CULTURAL RESOURCE AREA |
| | DELINEATED WETLAND |
| | FEMA FLOOD ZONE AE |
| | FEMA REGULATORY FLOODWAY |
| | FEMA FLOOD ZONE B |
| | FEMA REDUCED RISK AREA |
| | EXISTING DRAIN TILE |
| | HISTORICAL DRAIN TILE |
| PROPOSED | |
| | WILDLIFE FENCE |
| | PVCACE TRACKERS |
| | INVERTERS |
| | ACCESS ROAD |
| | UNDERGROUND ELECTRIC GEN-TIE LINE |
| | SUBSTATION |
| | VEGETATIVE SCREENING |
| | EX. VEGETATIVE SCREENING TO REMAIN |
| | SEED MIX - SEE VEG. MANAGEMENT PLAN |



Stantec
10000 MIDLANDIC DR SUITE 300W
MOUNT LAUREL, NJ 08054
WWW.STANTEC.COM

PRELIMINARY
NOT FOR CONSTRUCTION

LANDSCAPE PLAN

MACKINAW SOLAR
TAZEWELL COUNTY, IL

ISSUED: CUP APP
8/20/2026

NO.	REVISION	DATE
-----	----------	------

DRAWN	MJM
DESIGNED	MJM
CHECKED	JMT
APPROVED	JMC
PROJ. NO.	190319031

SHEET NUMBER
L1.04

Exhibit F

Statement from Road Official

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit G

Agricultural Impact Mitigation Agreement

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit H
Interconnection Application

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit I
Protected Species

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit J
SHPO Consultation

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit K
FAA Notice Criteria Tool Results

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit L
Road Condition Report



Road Condition Report

Summary of Roadway Conditions

Mackinaw Solar Project

Tazewell County, Illinois

August 18, 2026

Prepared for:

Mackinaw Solar LLC
2 Logan Square, Suite 1830
Philadelphia, PA 19103

Prepared by:

Matthew A Clementi, PE
Stantec Consulting Services Inc.

Table of Contents

1.0	INTRODUCTION	1
2.0	METHODOLOGY	2
2.1	DESKTOP REVIEW	2
2.2	AGENCY INTERVIEWS	2
2.3	IN PERSON FIELD REVIEW.....	3
3.0	ROADS AND INFRASTRUCTURE	3
3.1	EXISTING ROAD INFRASTRUCTURE	3
3.1.1	Township Roads	4
3.1.2	State and County Connecting Highways	5
3.1.3	Culverts and Bridges	6
3.2	METHODS TO BE USED TO HANDLE HEAVY OR LARGE LOADS ON LOCAL ROADS	6
3.2.1	Types of Over-Weight Loads.....	7
3.2.2	Types of Over-Size Loads	7
3.2.3	Methods – Over-Size and Over-Weight Loads	7
3.2.4	Construction Materials and Equipment Transport.....	7
3.2.5	Potential for Road Damage	8
3.3	PREFERRED ACCESS HIGHWAYS.....	8
3.3.1	Possible Road Modification Locations	9
3.3.2	Possible Road Modification Locations	9
3.3.3	Roads to be Avoided	9
3.4	SAFETY CONCERNS	9
3.4.1	Safety During Construction	10
3.4.2	Safety During Permanent Maintenance Operations.....	10
3.5	FIGURES	10
3.5.1	Project Area Map:	10
3.5.2	Regional Highway Map:	10
4.0	CONCLUSION	10
APPENDIX A	FIGURES	A.1
A.1	Project Area Map (Figure 1)	A.1
A.2	Regional Highway Map (Figure 2)	A.1

1.0 INTRODUCTION

Mackinaw Solar LLC (Mackinaw Solar), an affiliate of Doral Renewables LLC (Doral) is developing the Mackinaw Solar Project (Project), an up-to 500 Megawatt alternating current (MWac) photovoltaic (PV) solar energy generation project in Tazewell County, Illinois. The Project will be sited on approximately 3,824 acres of land, which is currently primarily in agricultural production. Ultimately, 1,264 acres of land will be located within Project fence lines. The major components of the Project will include solar modules, inverters, underground medium-voltage collection lines, access roads, one substation, an approximately 7.4-mile generator tie-line, temporary laydown yards and an Operation and Maintenance (O&M) facility.

Mackinaw Solar is preparing an application for a Conditional Use Permit for submission to the Tazewell County Zoning Board of Appeals to construct, operate and maintain the Project.

The Project will be located within the Townships of Spring Lake and Cincinnati, in Tazewell County, Illinois. The solar panel array will be spread across two 4 square-mile portions of the county separated by approximately 4 miles, southwest of the City of Pekin. The Project consists of an east-west tracking solar panel system and associated facilities on approximately 1,264 acres.

Construction of the Project is planned to begin in 2027 with a Commercial Operations Date anticipated in 2029. Temporary workspaces for Project construction will include staging areas for vehicles and equipment, and laydown areas for Project components. Permanent Project workspaces include areas proposed for the placement of solar arrays, power conversion units and inverters, and gravel roads required to access and maintain the solar arrays.

Mackinaw Solar has retained the services of Stantec Consulting Services Inc. (Stantec) to compile data and perform visual inspections of public roadways and infrastructure. Stantec has considered roadways within the limits of the Project and along access routes to the Project location. Stantec also evaluated the suitability of that infrastructure to support the expected construction traffic, internal utility connections, as well as on-going O&M vehicles.

2.0 METHODOLOGY

2.1 DESKTOP REVIEW

Stantec reviewed maps of proposed facility locations to identify roads internal to the Project area and potential haul routes to be used during construction. Aerial maps of the roadways were studied, as well as street-level photography for road conditions, existing driveway locations, pavement materials, shoulder materials and surrounding uses.

Traffic count information was acquired from the Illinois Roadway Analysis Database System (IROADS) website for the nearby State Highways and County Highways as well as for local township roads.

State of Illinois and US Highways were not reviewed in detail for this report as the State of Illinois and Federal Highway Systems are designed and built to accommodate large and heavy loads. These systems are maintained to State of Illinois and Federal Highway standards by the Tazewell County Highway Department and, for the purpose of this analysis, are deemed to be suitable for traffic associated with this Project.

Roadway and land-use information from the Towns' and County Comprehensive Land Use Plans were also acquired and reviewed.

2.2 AGENCY INTERVIEWS

Studies roads within the Project area fall under the jurisdiction of three agencies; Tazewell County Highway Department, and the Townships of Spring Lake and Cincinnati, for maintenance and normal upkeep. Stantec reached out to these departments for background information on the roads within the Project area.

- Stantec interviewed Dan Parr, Tazewell County Engineer, to discuss the conditions of the County Highways in and around the Project area. Mr. Parr provided a detailed description of the maintenance concerns, road ratings, bridge locations, culvert crossings, typical road and shoulder widths.

Mr. Parr stated that Manito Road (County Highway 16) and Townline Road (County Highway 7) within the Project area and extending to the north and east (respectively) are in generally good condition and should be suitable for regular haul route use. Travel on the Township roads, however, should be minimized when possible.

County Roads are generally weight restricted to 50,000 lbs and will require an overweight permit for typical semi-truck loads.

- Stantec interviewed Spring Lake Township Road Commissioner Braden Thomas regarding the Spring Lake Township Roadways within the project area. Within Spring Lake Township, the majority of haul route traffic should be routed to Manito Road and Townline Road which are County Roads and have been constructed to a higher standard than the typical local road. Roads within Spring Lake Township should be assumed to be restricted by weight limits lower than typical semi-truck loads and permits should be obtained for necessary haul routes.

- Stantec interviewed Cincinnati Township Road Commissioner Ron Hawkins, Jr., regarding the local (Cincinnati Township) roads. Mr. Hawkins noted that Town of Cincinnati roadways are generally weight limited to 8 Ton and that Wagoner Road is the best road in the area for heavy hauling.

The Town of Cincinnati has developed a Road Use Agreement (RUA) specifically for projects like this and they will adjust their standard RUA to meet this Project's specific requirements.

In general, the Tazewell County Highway department and the Townships of Spring Lake and Cincinnati will require overweight permits for standard semi-truck loads. These permits should be coordinated at the time of the Road Use Agreements.

2.3 IN PERSON FIELD REVIEW

After review of the State of Illinois IROADS database, aerial mapping and other publicly available databases, Stantec visited the Project area to complete an on-site evaluation of the roadways that are: within the Project area; adjacent to the Project; or provide a direct link to accessing the Project from Townline Road, Illinois Route 29 (IL 29), Illinois Route 9 (IL 9), and US Route 155 (US 155A). Roads linking the Project area to the surrounding Interstate Highways and within the Project area were also driven to verify the conditions and materials that had been noted in earlier portions of the investigations. The findings of the in-person field review have been incorporated into Section 3.0.

3.0 ROADS AND INFRASTRUCTURE

3.1 EXISTING ROAD INFRASTRUCTURE

The Project footprint lays within two tightly grouped sets of arrays, one within Spring Lake Township and the other within Cincinnati Township, within the following sections:

- Western Array: Sections 3, 4, 9, and 10, within T-23-N R-6-W of the Township of Spring Lake,
- Eastern Array: Sections 20, 21, 28, and 29 within T-24-N R-5-W of the Township of Cincinnati.

North of the Project area, new transmission lines will connect the Project to the electrical grid. County Highways 16, and 7, and State Route 29 will serve as the main routes of access in and around the Project vicinity.

Access roads for the Project arrays will be constructed throughout the Project area and connect to Township, County, and State roads. Access permits for State highways will be obtained from IDOT while Access Permits for County highways and Township Roads will be obtained from Tazewell County and the specific Townships prior to construction. Prior to construction, a representative of the County and each Township will typically meet with the contractor on site to discuss and review the proposed driveway locations. It is recommended that the Townships be provided with detailed information for all access points prior to site meeting, including site plan, driveway location information, typical driveway and culvert details, ownership information, contact information representatives in charge of construction and ongoing Project maintenance.

The Project's associated generation tie-in lines (gen-ties) will be generally located to the northeast of the western array and north of the eastern array and are shown on Figure A-1. The gen-tie lines are generally proposed to be located within easements on private property.

3.1.1 Township Roads

Township highways will provide the majority of access points within the Project area. The Townships maintain these highways, which are referred to as Local Roads in their Comprehensive Plans. They are generally 18-20 feet wide, in a right-of-way of 66 feet or less, and typically constructed of gravel with a chipseal surface or paved with asphalt.

Although the majority of the Township roads in and around the Project area are paved with asphalt, a number of these are designated as weight limited by the Township Boards. For continuity it is recommended that all Township and County roads should be assumed to be subject to temporary weight limits during the spring thaw. Additionally, even though a roadway may not be officially weight limited (permanently or seasonally), the contractor should be aware that local roads will be more prone to damage by heavy vehicles when compromised by saturated conditions or frost, even if the vehicles are well below enforced weights.

The following table provides data for the Township and County Roads in and around the Project area. In addition to surface and shoulder materials, the table contains the following data:

- If the segment of road is required to include an access point (r), if an access point is optional (o), or if there is no requirement for an access point at that location ()
- Whether that segment of road has a high chance (high) or low chance (low) for heavy construction traffic
- Traffic count data, as Average Daily Traffic (ADT) as listed in the IROADS database,

The following table provides road condition data for the roads in and around the Project area.

Table A: Road Condition Data

Road Name	Within Project Area	Township **	Project Access Point	Potential for High Construction Traffic	Average Daily Traffic (ADT)*	Surface and Width	Shoulder Material and Width
TOWNSHIP ROADS							
Airport Road	Y	SL	r	Med	75	20' Gravel with Chipseal	3' Sod
Spring Lake Road	Y	SL	o	Med	NA	18' Gravel with Chipseal	3' Sod
Warner Road	Y	SL		Low	50	20' Gravel with Chipseal	4' Sod
Herman Road	Y	SL		Med	NA	16' Gravel with Chipseal	3' Sod
Garman Road	Y	Cin	o	Low	250	20' Gravel with Chipseal	3' Sod
Bluebird Hill Road	Y	Cin	o	Med	NA	18' Gravel with Chipseal	3' Sod
Chester L Road	Y	Cin	o	Med	25-350	18' Gravel some Chipseal	2' Sod
Hurt Road	Y	Cin		Med	500	20' Gravel with Chipseal	3' Sod
Fuelberth Road	Y	Cin		Low	NA	18' Gravel with Chipseal	3' Sod
Wagonseller Road	Y	Cin	r	High	400	18' Asphalt	3' Sod
COUNTY & STATE ROADS							
Co Hwy 7 (Townline Road)	Y	(SL)	o	High	1000	22' Asphalt	4' Gravel
Co Rd 16 (Manito Road)	Y	(SL)	o	High	2650	24' Asphalt	4' Paved
IL Route 29	Y	(Cin)		High	5650	24' Asphalt over PCC	4' Gravel

* IROADS Estimated Traffic for Township Roads, County Roads list latest count

** Townships: SL= Spring Lake, Cin = Cincinnati, () = Tazewell County Highway or IDOT

3.1.2 State and County Connecting Highways

The most convenient state and federal highways in the vicinity which could be used for access to the Project area are IL-29 which runs north-south along the east edge of the Project area, and IL-9 which runs east-west and can connect the Project area to Interstate I-155 which is located approximately ten miles east of the Project area. These highways will not provide driveway access to the array areas but may serve as haul routes.

The state highways near the Project area are described below:

- IL-29 is a two-lane undivided highway that provides north-south connectivity along the east edge of the Project area connecting to I-9 at the southern border of the City of Pekin. It is classified as a Minor Arterial with 12-foot traveled lanes and a 4-foot aggregate shoulder. In 2025 the Average Daily Traffic (ADT) was measured at 5,650 Vehicles Per Day (VPD). IL-29 runs along the edge of the Project area and as such will not provide direct driveway connections to project access drives but can provide haul route access to I-155 via IL-9.

- IL-9 is four-lane undivided highway with bi-directional center turn lane that can provide connectivity from the Project area to I-155. It is classified as a Minor Arterial with 12-foot traveled lanes and an 8-foot concrete shoulder. In 2025 the Average Daily Traffic (ADT) was measured at 5,250 Vehicles Per Day (VPD). IL 100 will provide access to Grain Bin Hwy and Epworth Spring Road

State highways are rated utilizing the Condition Rating Survey (CRS) method to evaluate pavement condition and to predict the road's performance. The maximum value for CRS is a 9.0 and reflects a newly installed pavement surface. The minimum value is 1.0 which reflects a failure of the roadway. The CRS is applicable to paved roads and an explanation of the range of values is below:

- CRS Range 9.0 – 7.6 represents an excellent state of road condition.
- CRS Range 7.5 – 6.1 represents a good state of road condition.
- CRS Range 6.0 – 4.6 represents a fair state of road condition.
- CRS Range 4.5 – 1.0 represents a poor state of road condition.

IL-29 has a CRS rating of 5.0 according to IDOT as of February 2024, which indicates that the road is in a "fair" state.

IL-9 has a CRS rating of 8.0 (excellent) in the newest section adjacent to the southern edge of the City of Pekin, and a 5.7 (fair) east of Pekin, returning to 8.4 (excellent) just prior to reaching I-155.

3.1.3 Culverts and Bridges

Culverts within the Project area were reported to be in good condition by County and Township representatives. Stantec has not visually inspected roadway culverts, other than a cursory review for severely damaged or structurally compromised features.

The smaller (unrated) culverts within the Project area do not appear to be failing as observed from the surface, however these culverts have not been inspected in detail.

If overweight trucks are used for construction or deliveries, culverts should be structurally analyzed to verify that their load capacity is adequate for the expected loads. Accommodations should be made to temporarily or permanently increase the load capacity of the culverts if they are found to be inadequate.

3.2 METHODS TO BE USED TO HANDLE HEAVY OR LARGE LOADS ON LOCAL ROADS

Upon completion of construction, the day-to-day operation of the Project will require almost no large or heavy traffic. Typical vehicles used during day-to-day operations will be pick-up trucks or small vans for regular panel maintenance and site work (mowing, etc.).

During the approximately 18-month construction phase of the Project, large and heavy vehicles will be required more frequently. Heavy and large loads associated with the construction stage of this Project are described in the following sections.

3.2.1 Types of Over-Weight Loads

The heaviest Project deliveries will be associated with the step-up transformers to be located at the substation yards throughout the Project. The transformers will be transported on low-boy trailers and will require a crane for installation.

Truckloads of aggregate for installation of permanent gravel access roads will be delivered to the solar array sites in standard dump trucks and will not exceed typical weight limits.

3.2.2 Types of Over-Size Loads

Electrical transmission line poles proposed to be steel poles delivered in sections. Depending on the final design height of the poles, oversize trucks may be needed to deliver taller poles. The poles for this Project are currently anticipated to require only standard-length trucks.

Solar inverters within the solar array portion of the Project may exceed the 8.5-foot height that can be shipped on a standard height trailer. Low-boy trailers can accommodate 10-foot-tall equipment and will be utilized as needed.

3.2.3 Methods – Over-Size and Over-Weight Loads

State and County highways should be used for the delivery of large or heavy loads to minimize impacts on lower-strength or compromised local roads. Normal weight loads, such as PV Panels, should follow damage prevention strategies so that the high volume does not cause damage to existing roadways.

Due to the locations of access points along Township roads with varying strengths, it may be necessary to utilize low strength or deficient highways for the delivery of equipment or machinery. Mitigation techniques should be employed to minimize damage to the extent practicable. Mitigation techniques may include:

- Decrease in vehicle speed;
- Increase vehicle turning radius;
- Construction of deceleration lanes, additional asphalt lifts, paved shoulders, or wider driveway widths;
- Construction of additional gravel lifts along existing gravel or unimproved roads;
- Utilize vehicles which possess additional axles or special weight-distribution features;
- Using protective mats or temporary asphalt lifts for heavy load crossings.

In general, the most successful technique to preserve marginal local roads is avoidance. There are local roads within and adjacent to the Project which have posted weight limits or deteriorated pavement. These roads should be avoided when possible.

3.2.4 Construction Materials and Equipment Transport

Construction materials and equipment will be delivered by a variety of truck types. Approximately 10,140 truck deliveries are anticipated for construction support items. Construction support trips can be expected to include the following major items (an approximate count is given per trip type; the actual count will vary depending on final bid and equipment selection):

- Mobilization/demobilization of construction equipment including excavators, bulldozers, graders, water trucks, concrete pumps, cranes, forklifts, trailers, plows, trenchers, etc. – 500 total trucks during the construction phase – 50 to 75 weeks.
- Removing various trees and brush across the Project area. Approximately 30 trucks moving tree removal equipment onto the site, 125 truckloads of lumber removed from the site and another 10 truckloads of waste and scrap materials.
- Delivery of road aggregate with dump trucks – 2500 total trucks during a 20 to 30-week internal road construction period.
- Delivery of ready-mixed concrete with traditional ready-mix trucks – 800 truck deliveries during the approximate 25 to 30-week foundation construction period. The majority of the concrete trucks will be for foundations associated with the inverters, substations and O&M building.
- Delivery of skid mounted inverters including transformers on low-boy semis – 300 trucks during the 40-week electrical construction period.
- Delivery of electrical conductor and fiber optic spools and other equipment and supplies on lowboy semis – 200 trucks during the 40 to 50-week electrical construction period.
- Delivery of solar panels and tracker parts on semis – 4,250 delivery trucks and 1,000 dunnage removal trucks during the 40 to 50-week electrical construction period.
- Delivery of Miscellaneous Items (fencing, landscaping, meteorological station, culverts, tools and consumables, office trailers, etc.) – 400 trucks over the entire construction phase.
- For the Transmission Line, electrical poles will be composed of steel on 25 semi-trucks.

3.2.5 Potential for Road Damage

If required, prior to the start of construction, all roads in the Project area (as well as access routes from the Interstate highways, if necessary) will be video recorded using a high-frame rate, high-definition digital camera (Go-Pro or equal). This will set a baseline showing the condition of the roadways prior to the beginning of the Project and provide a “before” for comparison purposes. After construction is complete, the same roads will be re-televised in the “after” condition.

The greatest potential for roadway pavement damage will typically appear at the construction driveway access points due to the starting, stopping, and turning of semi-trucks and other heavy vehicles. Additionally, roadway edges are often the first part of an otherwise adequate roadway to show signs of failure. If roadway edges are damaged, the outside three to four feet of the roadway can be reconstructed by cutting down the costs of full-road width pavement rehabilitation.

Bridges and culverts around the Project area are reported to be structurally adequate for standard load vehicles. Since heavy vehicles are required for construction and transport of large equipment, culverts on the selected routes should be visually inspected prior to construction and after construction.

3.3 PREFERRED ACCESS HIGHWAYS

There are two possible haul routes from I-155 to the Project area based on the most direct routes utilizing state and County highways which are designed, built and maintained to accommodate trucks and other construction traffic. The recommended routes are listed here and are highlighted on Figures 1 and 2 Project

Area Map. It is possible, given Project design or access changes, that different routes may be considered by the contractor. If so, Project representatives will review the updated routes with County and Township representatives.

3.3.1 Possible Road Modification Locations

- Haul Route 1 from I-155 to the Project area: Shipments will use IL-9 along the south edge of the City of Pekin and then south along IL-29 to the eastern portion of the Project in the Town of Cincinnati or, west along County Road 16 Manito Road. To the western portion of the Project in the Town of Spring Lake. The drawback to this route is just west and south of the intersection of IL-9 with IL-20 and Manito Road, there are two narrow railroad bridges which could limit access. This route should be reviewed by County and Town representatives.
- Haul Route 2 from I-155 to the Project area: Shipments will use Townline Road (County Highway 7) approximately 4 miles south of the City of Pekin to travel from I-155 to the project area. The drawback to this route is the condition of Townline Road, which is in good or fair condition for parts of the 10-mile length. This route should be reviewed by County and Town representatives.

3.3.2 Possible Road Modification Locations

Road width or turning radius modifications are not expected to be required for Project deliveries. If internal array road access points are constructed sufficiently wide (25-30 feet+) at driveway locations, other modifications should not be necessary.

It is likely that gravel and unimproved Township roads will need to be regularly maintained during the construction process. Alternatively, these roads could be improved prior to construction by the addition of an additional layer of gravel or asphalt surfacing.

3.3.3 Roads to be Avoided

Discussions with the County and Township personnel identify only a few roadways which should be avoided if possible. With or without specific spring restrictions, Township and County roads should be treated carefully during the spring thaw. For safety reasons, Township roads, other than specific Project access points, should be avoided to minimize damage to lighter pavement sections. Unpaved roads should be avoided whenever possible due to decreased traction, implications of dust, and likelihood of rutting and potholes.

3.4 SAFETY CONCERNS

Access on and off existing roadways presents the largest safety concern for roads proposed to be utilized during Project construction and operation. Adherence to posted speed limits is an important factor in reducing accidents. Vehicle speeds on gravel and unimproved roads should be reduced as necessary for safety to 35 miles per hour (mph) as needed. Speed limits on County roads within the Project area are often not posted and can be assumed to be 55 mph.

3.4.1 Safety During Construction

Construction access points will be the most significant safety concern for this project. Whether it is a direct access point on a Township Road or a nearby intersection with a county highway, trucks entering and leaving the roadway should use warning signage and lights when possible, to alert other drivers to their presence. Construction Routes should be selected to avoid acute angle turning movements.

3.4.2 Safety During Permanent Maintenance Operations

During the operational phase of the Project, maintenance vehicles will typically consist of pick-up trucks, small box trucks, vans and small to mid-sized tractors for vegetation maintenance and mowing. Access drives should be properly signed and wherever possible, locations of new drives should be selected for best visibility.

3.5 FIGURES

3.5.1 Project Area Map:

Stantec has prepared a Project Area Map showing the Project vicinity and adjacent roadways. This map is attached as Figure 1.

3.5.2 Regional Highway Map:

Stantec has prepared a Regional Highway Map showing the Regional Highways and Interstates surrounding the Project. This map is attached as Figure 2.

4.0 CONCLUSION

Stantec performed a Roadway Condition Report for the Project, including the area of the solar array, and connections to the existing substation on behalf of Mackinaw Solar. Results of the assessment include the following:

- Permanent access drives may be placed on the nearest convenient highways without creating a significant safety hazard subject to permitting requirements of the Townships, IDOT, and Tazewell County
- Haul Route 1 from I-155 to the Project area: Shipments will use IL-9 along the south edge of the City of Pekin and then south along IL-29 to the eastern portion of the Project in the Town of Cincinnati or, west along County Road 16 Manito Road. To the western portion of the Project in the Town of Spring Lake. The drawback to this route is just west and south of the intersection of IL-9 with IL-20 and Manito Road, there are two narrow railroad bridges which could limit access. This route should be reviewed by County and Town representatives.
- Haul Route 2 from I-155 to the Project area: Shipments will use Townline Road (County Highway 7) approximately 4 miles south of the City of Pekin to travel from I-155 to the project area. The

drawback to this route is the condition of Townline Road, which is in good or fair condition for parts of the 10-mile length. This route should be reviewed by County and Town representatives.

- Proper signage and possible use of warning lights should be investigated for turning points
- Significant culvert damage is not expected based on the existing condition of the infrastructure and the small number of overweight vehicles expected for this Project. Culverts on planned access routes will be inspected prior to construction.
- Significant pavement damage is not expected on the paved roadways in the Project Area based on the existing condition of the infrastructure; however, localized damage should be expected at turn-offs to Project access drives and along unimproved and gravel roads.
- Prior to Project construction, Mackinaw Solar will prepare a Pre-Construction Road Condition Video of Township and County roads within the Project area and as required by the Road Use Agreements.

APPENDIX

Appendix A FIGURES

A.1 PROJECT AREA MAP (FIGURE 1)

A.2 REGIONAL HIGHWAY MAP (FIGURE 2)

U:\190319031903103103_data\gis_cad\gis\ArcPro\Mackinaw Solar\Mackinaw Solar.aprx Revised: 2026-08-19 By: djbilin

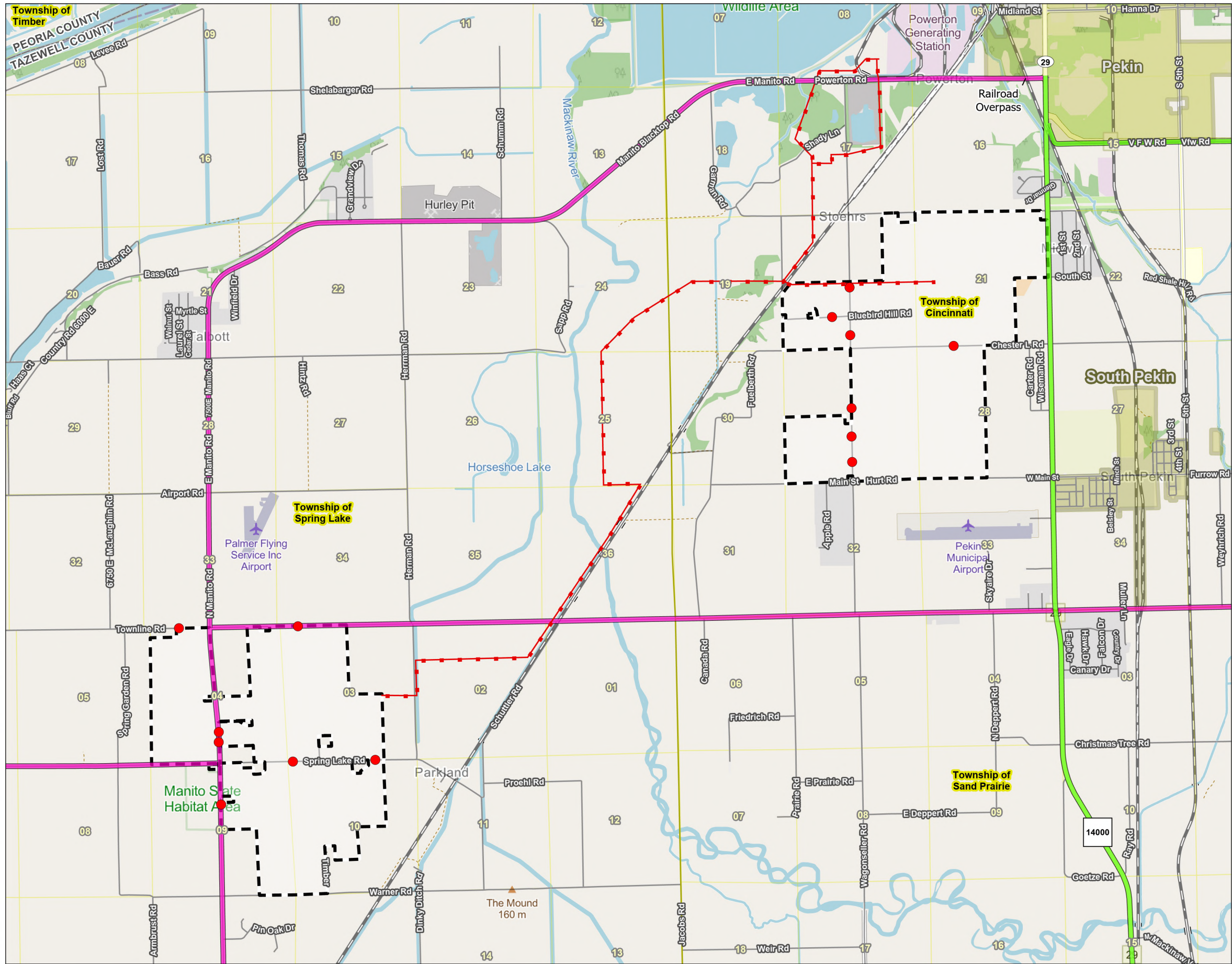
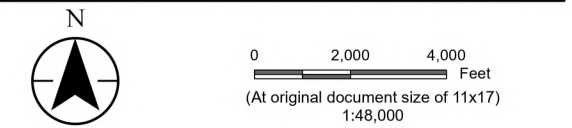


Figure No. 1
Title Project Overview Road Use Plan
Client/Project Mackinaw Solar LLC Mackinaw Solar Project 190319031
Project Location Tazewell County, Illinois Prepared by DJG on 2026-07-27 TR by SP on 2026-07-27 IR by MC on 2026-08-19



- Legend
- Gen-Tie Route (Preliminary)
 - Solar Project Area
 - Driveway Location
 - Road Under County Jurisdiction
 - Road Under State Jurisdiction
 - Township (USGS)
 - PLSS Section
 - Incorporated Place (US Census Bureau)



Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Stantec, Esri, USCB, USGS
3. Background: Esri OpenStreetMap



U:\190319031003103_data\gis_cad\gisArcPro\Mackinaw Solar.aprx Revised: 2026-08-19 By: djblin

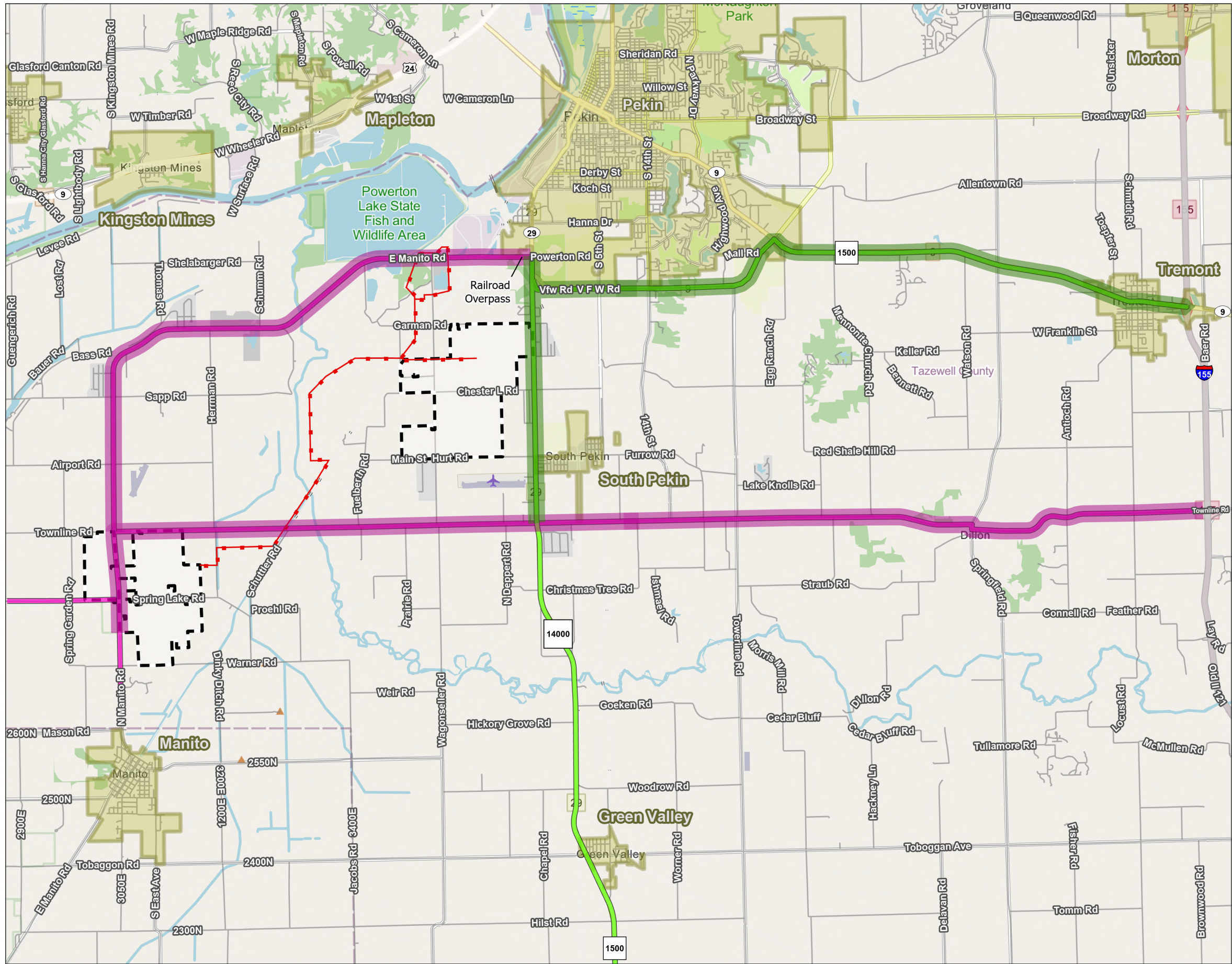


Figure No.
2

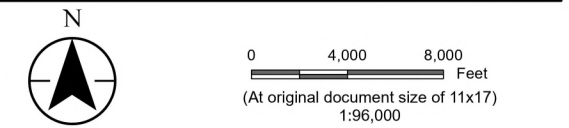
Title
**Regional Highway Map
Road Use Plan**

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

190319031

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-07-27
TR by SP on 2026-07-27
IR by MC on 2026-08-19



- Legend
- Gen-Tie Route (Preliminary)

Solar Project Area

Road Under County Jurisdiction

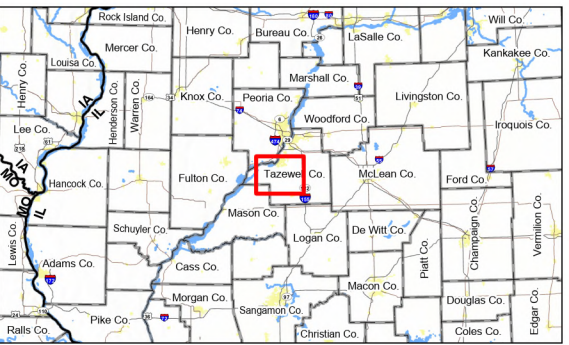
Road Under State Jurisdiction

Possible Haul Route - County Road

Possible Haul Route - State Road

Township (USGS)

Incorporated Place (US Census Bureau)



- Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Stantec, Esri, USCB, USGS
3. Background: Esri OpenStreetMap



Exhibit M
Noise Study

Mackinaw Solar Pre-Construction Sound Assessment

Tazewell County, IL



Prepared for:
Mackinaw Solar LLC

Date:
August 20, 2026

Prepared by:
Stantec Consulting Services Inc.

Project/File:
190319031

Disclaimer

The conclusions in the Report titled Mackinaw Solar - Pre-Construction Sound Assessment are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Mackinaw Solar LLC (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Prepared by:



Signature

Zamara Gandhi

Printed Name

Reviewed by:



Signature

Michael T. Conaway, P.E.

Printed Name

Approved by:



Signature

Jacob Poling, INCE Bd. Cert.

Printed Name

Table of Contents

Executive Summary	ii
Acronyms / Abbreviations.....	iii
1 Terminology.....	4
2 Project Description	5
3 Regulatory Environment and Criteria	5
4 Sensitive Receptor Locations.....	7
5 Sources and Modeling Methodology	7
6 Predicted Operational Modeling Results.....	9
7 Conclusion.....	12

List of Tables

Table 3.1: IPCB Sound Level Limits (Class C to Class A).....	6
Table 3.2: IPCB Sound Level Limits (Class C to Class B).....	6
Table 5.1: Equipment Sound Power Levels.....	8
Table 6.1 Summary of Estimated Sound Levels at Sensitive Residences and Residential Areas.....	10
Table 6.2 IPCB Compliance Assessment at Class A Land Use Receptor Locations with Highest Estimated Sound Levels	11
Table 6.3 IPCB Compliance Assessment at Class B Land Use Receptor Locations with Highest Estimated Sound Levels	11

List of Figures

Figure 1: Project Site Layout.....	13
Figure 2: Daytime Operational Sound Level Contours	14
Figure 3: Nighttime Operational Sound Level Contours	15

List of Appendices

Appendix A Project Equipment Locations	
Appendix B Receptor Locations and Daytime Operational Noise Modeling Results	
Appendix C Receptor Locations and Nighttime Operational Noise Modeling Results	



Executive Summary

Mackinaw Solar LLC (Mackinaw Solar) is developing the Mackinaw Solar Project (Project), a 500-megawatt alternating current (MWac) solar energy generation project in Tazewell County, Illinois. The solar area of the Project site is located on approximately 3,200 acres of land and is divided into two sections. The major components of the Project will include solar modules, inverter stations, access roads, two substations, and security fencing. Mackinaw Solar retained the services of Stantec Consulting Services Inc. (Stantec) to conduct a pre-construction sound assessment for the Project.

This sound assessment was completed to assess Project operational compliance with the Illinois Pollution Control Board (IPCB) noise regulation and Tazewell County solar facility/renewable energy facility noise regulations. The applicable Tazewell County ordinances require that the Project meet the IPCB noise regulations; thus, compliance with the IPCB noise regulation satisfies both the IPCB regulation and the Tazewell County regulations. Operational noise modeling was completed to estimate sound levels generated by the Project equipment. Modeled sound levels were predicted using CadnaA noise modeling software, configured to implement ISO 9613-2 environmental sound propagation algorithms. The modeling accounted for noise from the proposed solar array inverter stations based on manufacturer-provided data and the Project substation transformers based on expected operational use specifications.

The maximum Project-generated A-weighted sound levels at the nearby Class A land (residences) are estimated to be an equivalent sound level (L_{eq}) of 50 and 35 A-weighted decibels (dBA) during daytime and nighttime, respectively. The maximum Project-generated A-weighted sound levels at the nearby Class B land (primarily commercial) are estimated to be 45 dBA. The noise modeling results demonstrate that expected daytime and nighttime sound levels at the nearby identified receptor locations are anticipated to comply with the IPCB limits in all octave bands with noise attenuation applied to four inverters. Therefore, the Project is expected to operate in compliance with all applicable sound level limits with the inclusion of appropriate mitigation measures.



Acronyms / Abbreviations

Acronym / Abbreviation	Full Name
AC	Alternating Current
dB	Decibel
dBA	Decibel (A-weighted)
DC	Direct Current
Hz	Hertz
IPCB	Illinois Pollution Control Board
kV	Kilovolt
Leq	Equivalent continuous sound level
Mackinaw Solar	Mackinaw Solar LLC
MVA	Megavolt-ampere
MW	Megawatt
MWac	Megawatts alternating current
Project	Mackinaw Solar Project



1 Terminology

Sound is caused by vibrations that generate waves of minute pressure fluctuations in the surrounding air. Sound levels are measured using a logarithmic decibel (dB) scale. Noise is typically defined as unwanted sound.

Human hearing ranges from 20 to 20,000 Hz. Human hearing varies in sensitivity for different sound frequencies, and the frequency sensitivity changes based on the overall sound level. The ear is most sensitive to middle frequency sounds between 800 and 8,000 Hertz (Hz) and is least sensitive to low frequency sounds below 400 Hz and high frequency sounds above 12,500 Hz. Consequently, several different frequency weighting networks have been used to approximate the way the human ear responds to various frequencies at different sound levels. Of most common use is the A-weighting network. A-weighting adjusts low and high frequency sound levels to mimic the response of the human ear at low to moderate sound levels, which are typical of environmental sources. A-weighted decibels, or dBA, are most widely used for regulatory requirements. Sound levels without a frequency weighting applied, referred to as unweighted or linear, are generally reported as dB.

Broadband (overall) sound levels which are expressed as a single number in decibels, account for acoustical energy across the frequency spectrum, including energy at low, middle, and high frequencies. To assess how much acoustical energy is present in different ranges of the frequency spectrum, sound can be separated into spectral (frequency) components using octave band filters. For environmental noise assessments, octave band sound levels are often expressed in unweighted decibels (dB) at octave band center frequencies from 31.5 to 8,000 Hz.

Environmental sound is variable in time; therefore, it is appropriate to analyze sound levels statistically. Numerous metrics and indices have been developed to quantify the temporal characteristics (changes over time) of environmental noise. A common metric for assessing environmental noise is the equivalent sound level, or L_{eq} . The L_{eq} is a metric that corresponds to the average, or equivalent, sound level over a defined period of time.

A change in sound levels of 3 decibels is generally considered to be the threshold of perception, whereas a change of 5 decibels is clearly perceptible, and a change of 10 decibels is perceived as a doubling or halving of loudness. Each time the number of noise sources is doubled (or halved), logarithmic addition (or subtraction) of decibels results in a 3 decibel change in sound levels.

The sound power level (PWL) of a noise source is related to the acoustic energy that the source emits regardless of the environment in which it is placed. Sound power is a property of the source and therefore is independent of distance or surrounding area. The radiating sound power then produces a sound pressure level (SPL) at a point that human beings can perceive as audible sound. The sound pressure level is dependent on the acoustical environment (e.g., indoor, outdoor, absorption, reflections) and the distance from the noise source. Unless otherwise stated, sound levels in this report refer to sound pressure levels.



2 Project Description

Mackinaw Solar is planning to construct the Mackinaw Solar Project (Project), a 500-Megawatt alternating current (MWac) solar energy generation project. The solar area of the Project site is located on approximately 3,200 acres of land in Tazewell County Illinois, divided into two sections. The two sections are located in the northeast corner and in the southwest corner of the Project area. The southwest section of the site is planned on approximately 1,500 acres of land. This area is roughly bound by Townline Road to the north, Herman Road to the east, Warner Road to the south, and Spring Garden Road to the west. The northeast section of the site is planned on approximately 1,700 acres of land. This area is roughly bound by Garman Road to the north, State Route 23 to the east, Hurt Road to the south, and Fuelberth Road to the west. The Project currently consists of primarily agricultural land and is surrounded by agricultural land with larger population centers near the northern and eastern sides of the site. An operating railway is located between the two sections aligned along the northeast-southwest axis.

The proposed plan calls for the development of the Project site to accommodate a solar facility, which includes two electrical substations. The solar facility will consist of photovoltaic (PV) modules, solar inverter stations (also referred to as "power conversion stations"), and an electrical collection system that help convert solar radiation into electricity. Specifically, the solar panels produce direct current (DC) voltage from the solar radiation received by the panels that are converted to AC voltage through a series of inverters. The solar equipment will be tied into a Project substation with power transformers; the power transformers will step up the voltage of the electricity received from the solar facility for transfer to the electrical grid. The Project site will also contain access roads and perimeter security fencing. Solar arrays and inverter stations will be located through the two Project sections. The Project substations will be located near the eastern border of the southwest section and near the northern border of the northeast section of the site.

The sound-producing equipment located on the Project site includes solar inverter stations and substation power transformers. Overall, the Project is anticipated to include 135 solar inverter stations and 2 substation transformers. The Project layout, the surrounding area, and nearby noise-sensitive receptors are shown in **Figure 1**. Coordinates of Project sound-producing equipment are provided in **Appendix A**.

Because solar energy facilities operate by converting solar radiation into electricity, the solar portion of the Project will only produce electricity between sunrise and sunset. Therefore, the solar inverters produce sound only when operating during daylight hours. After sunset, the solar panels no longer receive solar radiation; therefore, the solar array inverters will operate in stand-by mode, emitting minimal sound. The substation transformers are generally expected to operate at full capacity during daylight hours when the solar arrays will be generating power and at lower capacity during the nighttime hours. However, the Project transformers have been assumed to operate at full capacity during daytime and nighttime hours for a conservative analysis.

3 Regulatory Environment and Criteria

Project sound is potentially regulated by State regulations and County ordinances. These regulations and ordinances were reviewed for their applicability to Project-generated sound.



The State of Illinois establishes sound level limits under the Illinois Pollution Control Board (IPCB) and are applicable to operational sound generated by the Project. The IPCB regulation is found in Title 35 of the Illinois Administrative Code: Environmental Protection, Subtitle H: Noise, Chapter I: Pollution Control Board Parts 900 and 901. This regulation establishes sound level limits that apply to noise generated on an “emitting parcel” at the property line of a “receiving parcel.” The IPCB limits vary depending on the land use class of the emitting and receiving parcels and whether the noise occurs during the daytime (7:00 AM to 10:00 PM) or nighttime (10:00 PM to 7:00 AM) periods. The sound level limits are expressed as unweighted sound levels in octave bands with center frequencies from 31.5 to 8,000 Hz, and project-generated sound levels must not exceed the sound level limit in any of the octave bands to comply with the regulation. The IPCB sound level limits apply to sound levels generated during Project operation; however, sound from equipment used for construction is excluded from the regulation under Section 901.107.

Because the Project will fall under the ‘utility and utility service’ land use classification once developed, the Project is a Class C land use. Nearby places of worship and residential noise-sensitive receptors are considered Class A land uses. Therefore, the sound level limits established for Class A receiving parcels from Class C emitting parcels apply to the Project. It should be noted that residences on agricultural land, such as some residences around the site, are Class A land uses within Class C land uses. Therefore, the Class A land use limits need to be met at the edge of the residential use area within the agricultural property. The IPCB sound level limits for Class C emitting parcels received at Class A parcels, located in Section 901.102, (i.e., the limits that are applicable to the Project) are presented in **Table 3.1** below.

Table 3.1: IPCB Sound Level Limits (Class C to Class A)

Period	Sound Level Limit (dB)								
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz
Daytime	75	74	69	64	58	52	47	43	40
Nighttime	69	67	62	54	47	41	36	32	32

Nearby receptors for commercial properties, emergency services, and cemeteries are considered Class B land uses. Therefore, the sound level limits established for Class B receiving parcels from Class C emitting parcels also apply to the Project. The IPCB sound level limits for Class C emitting parcels received at Class B parcels, located in Section 901.103, are presented in **Table 3.2** below. There are no separate daytime and nighttime sound level limits for Class B land.

Table 3.2: IPCB Sound Level Limits (Class C to Class B)

Period	Sound Level Limit (dB)								
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz
Day and Night	80	79	74	69	63	57	52	48	45



Tazewell County regulates solar facilities in their Code of Ordinances under Chapter 153: Renewable Energy Ordinance and Chapter 156: Solar Energy Systems. Both Section 153.05(A)(6) and Section 156.06(B)(9) stipulate that sound levels produced by a solar facility shall be in compliance with the IPCB regulation discussed above. Section 153.05(A)(6) goes on further stating that post-construction sound level measurements must be conducted at the perimeter of the facility within one year following the commencement of operation of the facility to demonstrate compliance.

Therefore, for this analysis, Project-generated sound must meet the meet the IPCB octave band limits in **Table 3.1** or **Table 3.2**, depending on the classification of the receiving parcel, to comply with the IPCB regulation and Tazewell County regulations. It should be noted that these sound level limits only apply to operational noise generated by the Project, not noise generated by construction activities.

4 Sensitive Receptor Locations

Publicly available aerial imagery was utilized to identify noise-sensitive receptors (also referred to as sensitive receptors), which include residences and cemeteries located near the solar facility. A total of 441 residential and 3 places of worship receptors (Class A land use) were identified within 0.5 miles of the Project limits. There are 31 commercial receptors, 1 emergency service, and 4 cemeteries (Class B land use) identified within 0.5 miles of the Project limits. Additionally, five property line locations, adjacent to the Project equipment, were used to assess compliance at the edge of residential areas. The residences and residential area (property line) receptor locations are shown in **Figure 1**.

5 Sources and Modeling Methodology

The Project, as currently proposed, includes 135 solar inverter stations within the solar generation arrays and 2 substation transformers, as shown in **Figure 1**. These are the primary operational sound sources associated with the Project.

Sungrow SG4400UD-MV-US solar array inverter stations are expected to be used for the Project. Each inverter station will include an inverter and a medium voltage transformer. This analysis assumed a sound power level of 100 dBA for the solar array inverter stations based on manufacturer sound testing data for the specified unit. The inverter station octave band sound level spectrum from the manufacturer noise testing report was utilized. The Project plans to apply on-equipment noise mitigation measures (e.g., noise reduction kits) to reduce the sound generated by four inverters. Inverters I-043, I-032, and I-035 are anticipated to need 5 dB of sound attenuation, while I-001 is anticipated to need 8 dB of sound attenuation. Equipment noise mitigation has been incorporated into the noise modeling results for these four inverters.

The Project substations are expected to include 175 megavolt-ampere (MVA) power transformers. The NEMA TP 80050-2013 (R2024) standard¹ and methods from the Electric Power Plant Environmental Noise Guide² were used to estimate the overall and octave band sound power levels for the transformers. Based

¹ National Electrical Manufacturers Association (NEMA) Standards Publication TP 80050-2013 (R2024)). Transformers, Step Voltage Regulators and Reactors.

² Edison Electric Institute. Electric Power Plant Environmental Noise Guide. Volume 1 2nd Edition.



on these standards and methods, the power transformers are estimated to have a NEMA noise rating of 82 dB and a PWL of 102 dBA. These standards and methods were also used to estimate the octave band sound levels for the transformers.

The equipment A-weighted and octave band sound power levels used for the assessment are presented in **Table 5.1** below.

Table 5.1: Equipment Sound Power Levels

Equipment	Octave Band Sound Power Level (dB)									Broadband Sound Power Level, dBA
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	
Solar Inverter Station (unmitigated)	90	98	94	91	93	90	97	91	62	100
Solar Inverter Stations I-032, I-035, I-043 (with mitigation)	85	93	89	86	88	85	92	86	57	95
Solar Inverter Station I-001 (with mitigation)	82	90	86	83	85	82	89	83	54	92
Substation Transformer	99	105	107	102	102	96	91	86	79	102

Sound attenuates between a source and receptor location due to a variety of factors, including but not limited to, distance between the source and receptor, atmospheric absorption, ground type, topography, shielding from solid structures, vegetation, and meteorological conditions. Operational sound levels from the proposed Project equipment were estimated using the Datakustik CadnaA noise prediction software (the “model”), which utilizes the ISO 9613-2 standard³ algorithms for outdoor sound propagation. CadnaA is a widely used modeling tool to estimate outdoor sound propagation.

The model was developed by importing the proposed Project layout, topographic data from the U.S. Geological Survey National Elevation Dataset, and aerial imagery. The solar inverter stations and the substation transformer were modeled as point sources within the model based on the Project layout. The solar inverters were modeled at 2.4 m (7.9 ft) above grade, while the substation transformers were modeled at 3 m (9.8 ft) above grade. Receptor locations for the nearby noise-sensitive receptors are located at 1.5 m (5 ft) above grade. A ground factor of 0.5 was used in the noise model to represent the ground of the Project parcels and surrounding area. Additional assumptions that were used to estimate worst-case operational sound levels included the following:

³ ISO 9613-2: 2024. Acoustics – Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors.



- No sound attenuation from vegetation (foliage) to simulate a worst-case condition.
- Sound attenuation from existing buildings is not accounted for in the Model. Land uses with intervening buildings between the receptor location and the Project noise sources will receive additional sound attenuation from buildings.
- Meteorological conditions that are conducive to sound propagation with all receptors located downwind of all noise sources.

The model produces estimated sound levels at the specified receptor locations as well as contours of equal sound level. These outputs of the model are used to compare model results to the Project sound level limits to evaluate regulatory compliance, as discussed in the next section.

6 Predicted Operational Modeling Results

An operational noise analysis was completed for the Project for both daytime and nighttime conditions. The modeled daytime operational condition includes sound from solar array inverter stations and the substation transformers operating simultaneously at full load. The modeled nighttime operational condition includes sound from the substation transformers only. While it is anticipated that the Project substation power transformer operation during nighttime hours will be in a quieter standby mode, the estimated nighttime sound levels assume operation at full load to conservatively estimate sound levels.

Estimated sound levels at each sensitive receptor location (“R-” prefix) are provided in tabular format in **Appendix B** and **Appendix C** for the daytime and nighttime conditions, respectively. Estimated sound levels at sensitive receptors placed along select locations on the Project property line or edges of residential areas (“PL-” prefix) are also provided in **Appendix B** and **Appendix C**. Sound level contours, which illustrate areas of equal sound level, are displayed in **Figure 2** and **Figure 3** for daytime and nighttime conditions, respectively. The figures present the expected broadband A-weighted sound levels due to the operation of the Project sound sources. The sound level contours do not include the contribution of ambient sound levels.

The results of the analysis show that the highest L_{eq} sound level generated by the Project at nearby identified residences is expected to be 49 dBA at R-066 during the day. R-066 is closest residential building to Project equipment and is located northwest of I-001. The highest sound level generated by the Project at the property line during daytime hours is estimated to be 50 dBA at PL-5, which is located in between R-066 and I-001. The other identified receptors receive daytime sound levels lower than the ones listed above.

The highest L_{eq} sound level generated by the Project during nighttime hours at identified residences is estimated to be 35 dBA at R-119, which is the closest residence to the southwestern section substation. The highest sound level generated by the Project at the property line during nighttime hours is estimated to be 34 dBA at PL-3, which is also near the southwestern section substation. The other identified receptors receive nighttime sound levels lower than the ones listed above.

Table 6.1 presents a summary of estimated project-generated sound levels at nearby noise-sensitive residences and residential areas. During the daytime, a majority of the identified receptors receive Project-



generated sound levels less than or equal to 40 dBA. At night, all identified receptors receive sound levels less than or equal to 35 dBA.

Table 6.1: Summary of Estimated Sound Levels at Sensitive Residences and Residential Areas

Estimated L_{eq} Sound Level	Number of Receptors	
	Daytime	Nighttime
35 dBA or less	92	442
36 dBA to 40 dBA	252	0
41 dBA to 45 dBA	85	0
46 dBA to 50 dBA	13	0
Greater than 50 dBA	0	0

Table 6.2 compares the estimated daytime and nighttime Project-generated sound levels to the IPCB sound level limits at the closest receptor (Class A land use) expected to be exposed to the highest Project-generated sound. Results are shown for receptor R-066, the receptor with the highest daytime sound level, and receptor R-119, the receptor with the highest nighttime sound level. The table also displays results for PL-5 and PL-3, the receptors with the highest daytime and nighttime sound levels measured along the residential or Project boundaries, respectively. These results demonstrate that the expected highest daytime and nighttime Project-generated sound levels at Class A receiving parcels are anticipated to comply with the IPCB limits in all octave bands.

Table 6.3 compares the estimated Project-generated sound levels to the IPCB sound level limits at the closest Class B land use receptor location expected to be exposed to the highest Project-generated sound. Results are shown for receptor R-231, the location with the highest sound level. These results demonstrate that the expected highest Project-generated sound levels at Class B receiving parcels are anticipated to comply with the IPCB limits in all octave bands.

The results tables in **Appendix B** and **Appendix C** further demonstrate that estimated sound levels at each identified receptor are expected to comply with IPCB limits. Because the Project is expected to comply with the IPCB limits, the Project is also expected to comply with the Tazewell County solar facility noise regulations.

These results show that the Project is expected to operate in compliance with the IPCB sound level limits contingent upon including noise attenuation at four specific inverters. Sound generated by inverter I-043, I-032, and I-035 needs to be attenuated by 5 dB, and sound generated by inverter I-001 needs to be attenuated by 8 dB. This can be achieved by installing noise reduction kits on the inverters or substituting the inverters with quieter equipment that meets the PWL shown in **Table 5.1**. Alternatively, compliance can be achieved with site layout modifications that relocate the above-referenced inverters approximately 400 to 600 feet farther from the Project property line and nearby receptor locations.



Table 6.2: IPCB Compliance Assessment at Class A Land Use Receptor Locations with Highest Estimated Sound Levels

Receptor ID	Description	Octave Band L _{eq} Sound Level (dB)									Broadband L _{eq} Sound Level (dBA)
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	
R-066	Estimated Daytime Sound Level	42	50	42	37	41	40	46	36	0	49
	IPCB Day Sound Level Limit	75	74	69	64	58	52	47	43	40	N/A
PL-5	Estimated Daytime Sound Level	44	52	44	38	42	41	47	38	3	50
	IPCB Day Sound Level Limit	75	74	69	64	58	52	47	43	40	N/A
R-119	Estimated Nighttime Sound Level	37	43	40	33	35	30	23	6	0	35
	IPCB Night Sound Level Limit	69	67	62	54	47	41	36	32	32	N/A
PL-3	Estimated Nighttime Sound Level	37	43	38	31	34	29	20	1	0	34
	IPCB Night Sound Level Limit	69	67	62	54	47	41	36	32	32	N/A

Table 6.3: IPCB Compliance Assessment at Class B Land Use Receptor Location with Highest Estimated Sound Levels

Receptor ID	Description	Octave Band L _{eq} Sound Level (dB)									Broadband L _{eq} Sound Level (dBA)
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz	
R-231	Estimated Sound Level	41	50	40	34	38	37	42	27	0	45
	IPCB Sound Level Limit	80	79	74	69	63	57	52	48	45	N/A



7 Conclusion

An operational sound level analysis was completed for the Mackinaw Solar Project to evaluate compliance of Project-generated sound at nearby noise-sensitive receptors with applicable regulations. The Project must comply with the IPCB sound level limits, which include daytime and nighttime octave band sound levels. The Project must also comply with Tazewell County regulations for solar facilities. Tazewell County requires that solar facilities meet the IPCB sound level limits in their solar facility ordinance and renewable energy facility ordinance. The Tazewell County Renewable Energy Ordinance also requires that compliance with IPCB sound level limits must be verified through post-construction sound level measurements one year after facility operations begin.

An operational noise model was developed and utilized to estimate the sound levels generated by Project equipment, including sound from the proposed solar array inverter stations and substation transformers. During the daytime, inverter stations and the substation transformers are expected to operate. It has been assumed that three inverters will be equipped with mitigation features to reduce the sound level. At night, the substation transformers are assumed to operate for a conservative analysis.

The noise modeling results show that the maximum Project-generated sound level was estimated to be 49 dBA during daytime and 35 dBA during the nighttime at nearby buildings classified as Class A land use. At the identified property line receptors, the highest estimated daytime and nighttime sound levels are 50 dBA and 34 dBA, respectively. The noise modeling results show that the maximum Project-generated sound level was estimated to be 45 dBA at nearby Class B receiving parcels. An analysis in octave bands shows anticipated compliance with the IPCB limits at nearby identified Class A and Class B receptors. Because there is anticipated compliance with the IPCB limits, there is also anticipated compliance with Tazewell County solar facility noise regulations.

The results of this study demonstrate that the Project is expected to operate in compliance with the IPCB sound level limits if sound generated from inverter I-043, I-032 and I-035 is attenuated by 5 dB and sound generated by inverter I-001 is attenuated by 8 dB. This can be achieved with noise reduction kits or using quieter inverters. Alternatively, the site layout can be adjusted to move these inverters farther from noise-sensitive receptors.

This study is based on preliminary Project information provided by Mackinaw Solar available at the time of the assessment. Key inputs such as equipment specifications, locations, and quantities used in this study should be confirmed during the final design. When the Project layout or equipment selections are modified, it is recommended that this sound assessment be updated.



Figure 1: Project Site Layout



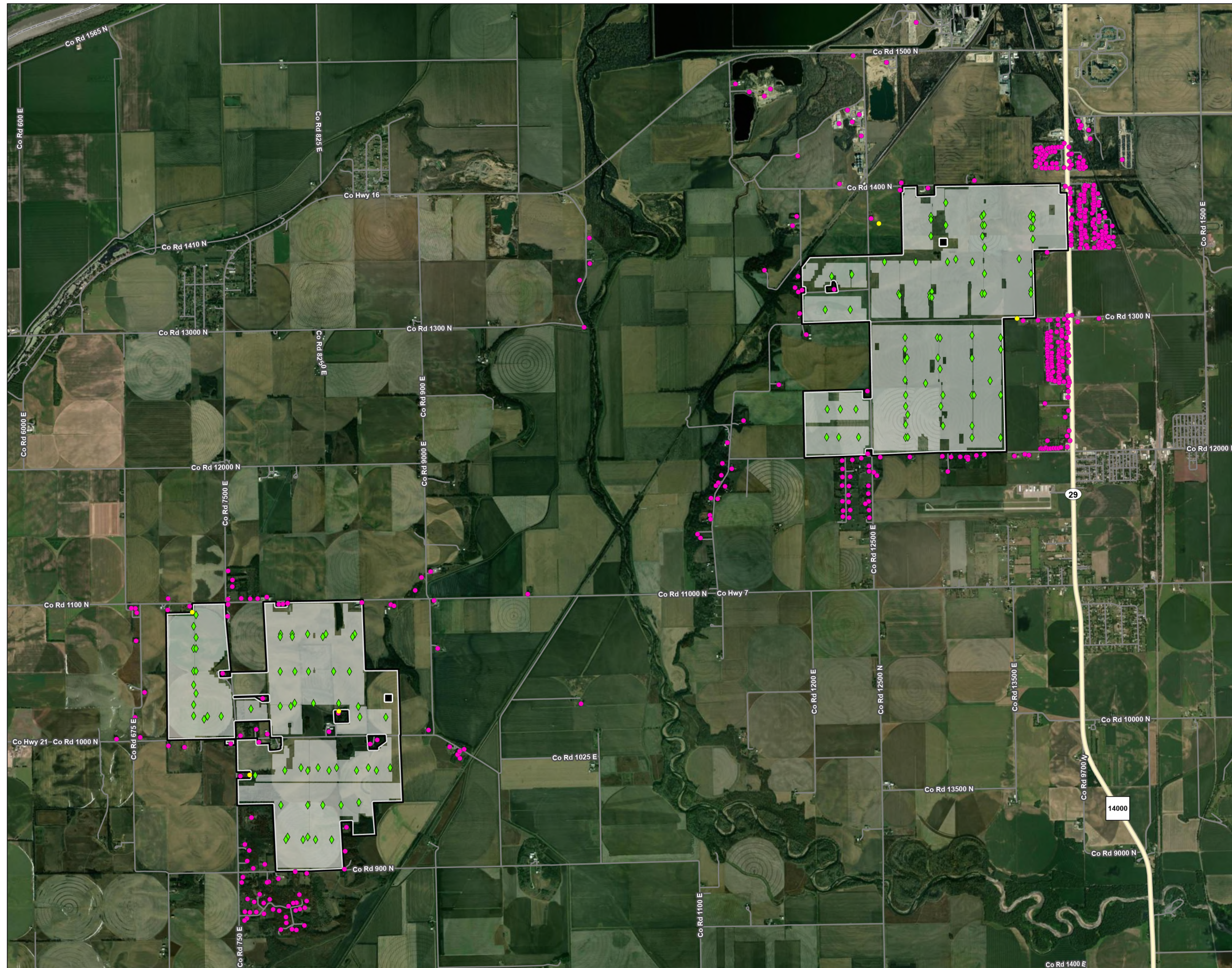


Figure No.

1

Title
Project Site Layout

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

190319031

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



0 2,000 4,000 Feet
(At original document size of 11x17)
1:48,000

Legend

-  Solar Project Area
-  Solar PV Array
-  Solar Inverter
-  Substation Transformer
-  Sensitive Receptor
-  Property Line Receptor



Notes

- Notes**
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
 2. Data Sources: Doral, Stantec, Esri, USCB, USGS
 3. Background: NAIP 2023



Figure 2: Daytime Operational Sound Level Contours



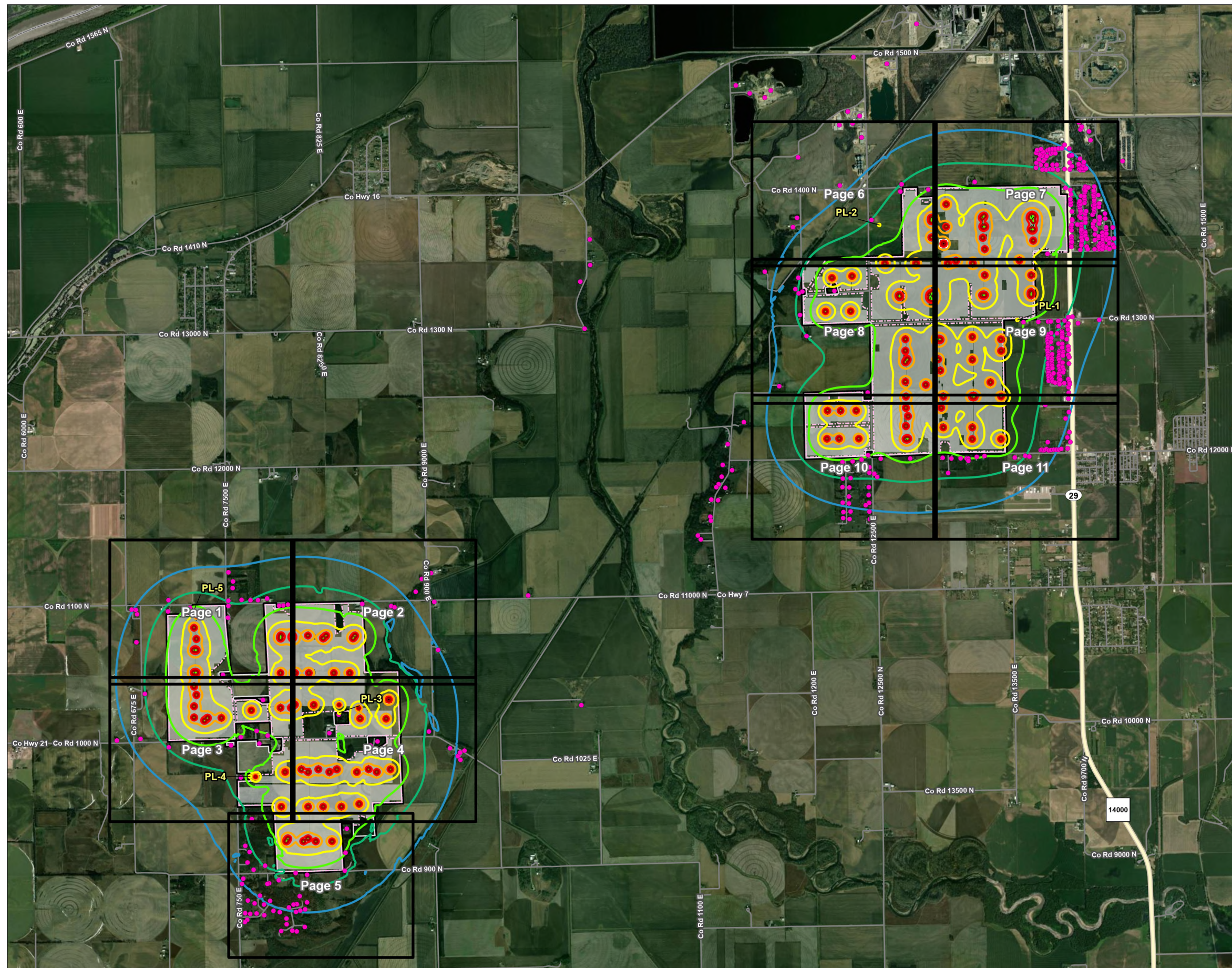


Figure No.

2

Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

190319031

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



0 2,000 4,000 Feet
(At original document size of 11x17)
1:48,000

Legend

-  Solar Project Area
-  Solar PV Array
-  Fence
-  Solar Inverter
-  Substation Transformer
-  Sensitive Receptor
-  Property Line Receptor

Daytime Sound Level Contours (dBA)

- | | |
|---|----|
|  | 35 |
|  | 40 |
|  | 45 |
|  | 50 |
|  | 55 |
|  | 60 |
|  | 65 |



Notes

- Notes**
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
 2. Data Sources: Doral, Stantec, Esri, USCB, USGS
 3. Background: NAIP 2023



Index

U:\190319031003103_data\gis_cad\gis\ArcPro\Mackinaw Solar\Map.aprx Revised: 2026-08-12 By: djblin

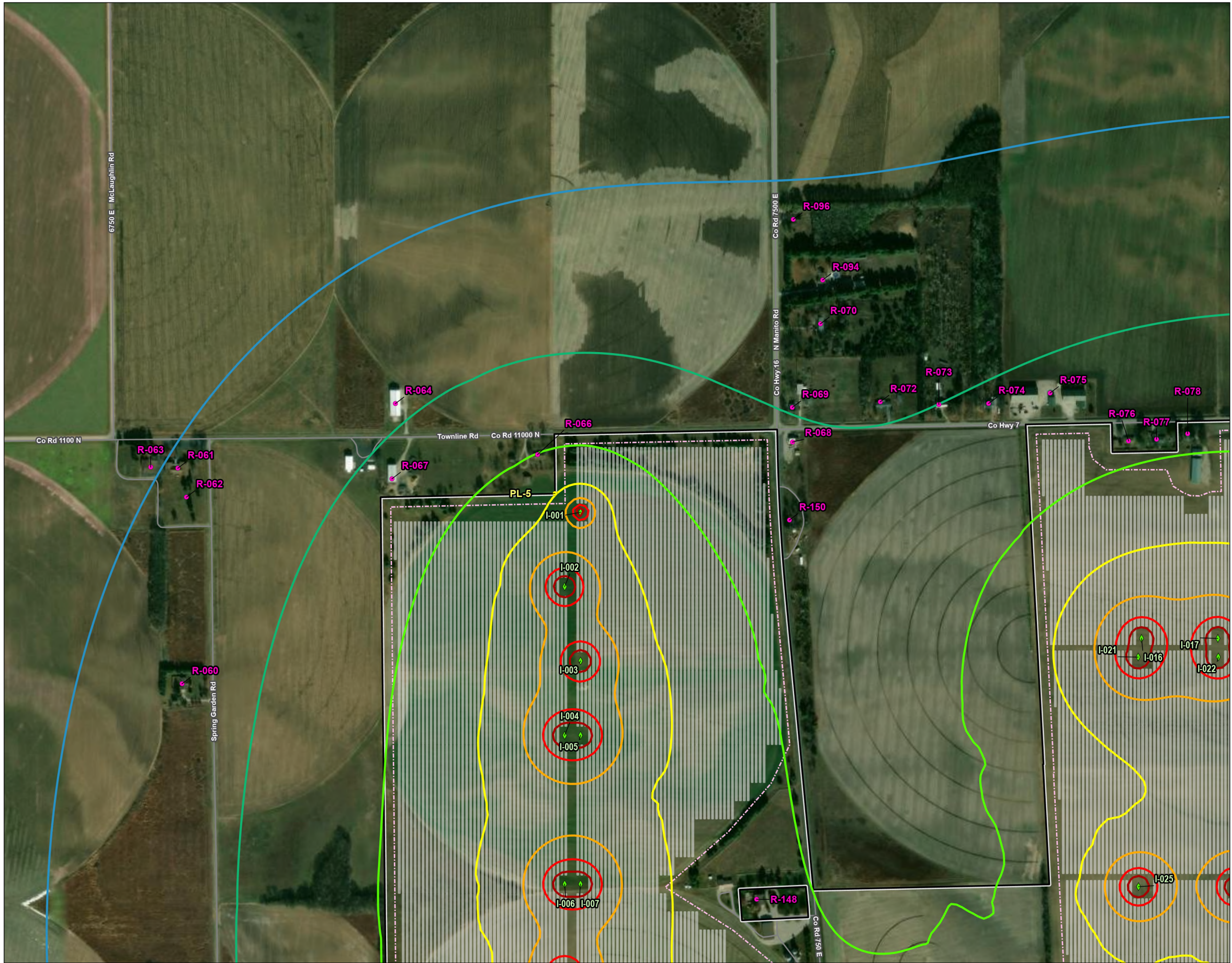


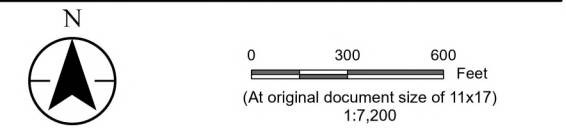
Figure No.
2

Title
Daytime Operational Sound Level Contours

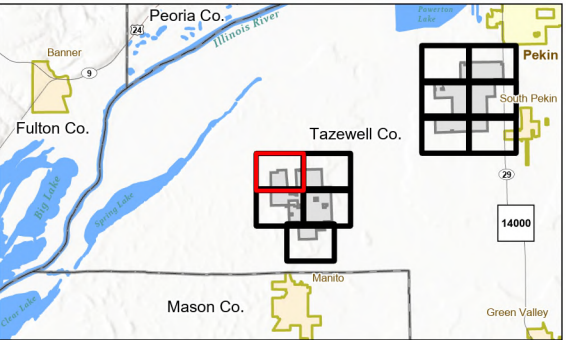
Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



U:\190319031903103103_data\gis_cad\gis\ArcPro\MapMackinaw Solar.aprx Revised: 2026-08-12 By: djbilin



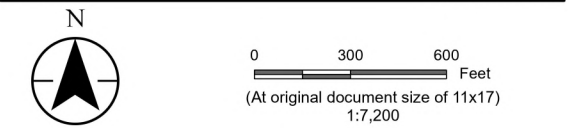
Figure No.
2

Title
Daytime Operational Sound Level Contours

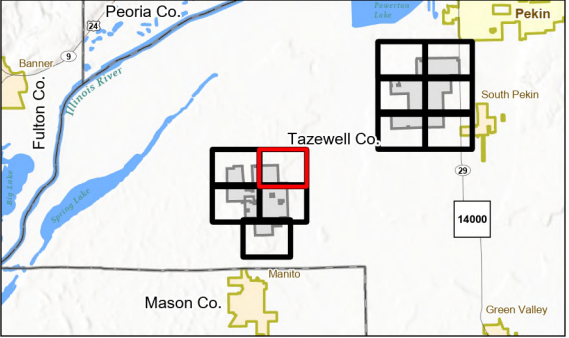
Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



U:\190319031903103103_data\gis_cad\gis\ArcPro\MapMackinaw Solar.aprx Revised: 2026-08-12 By: djbilin

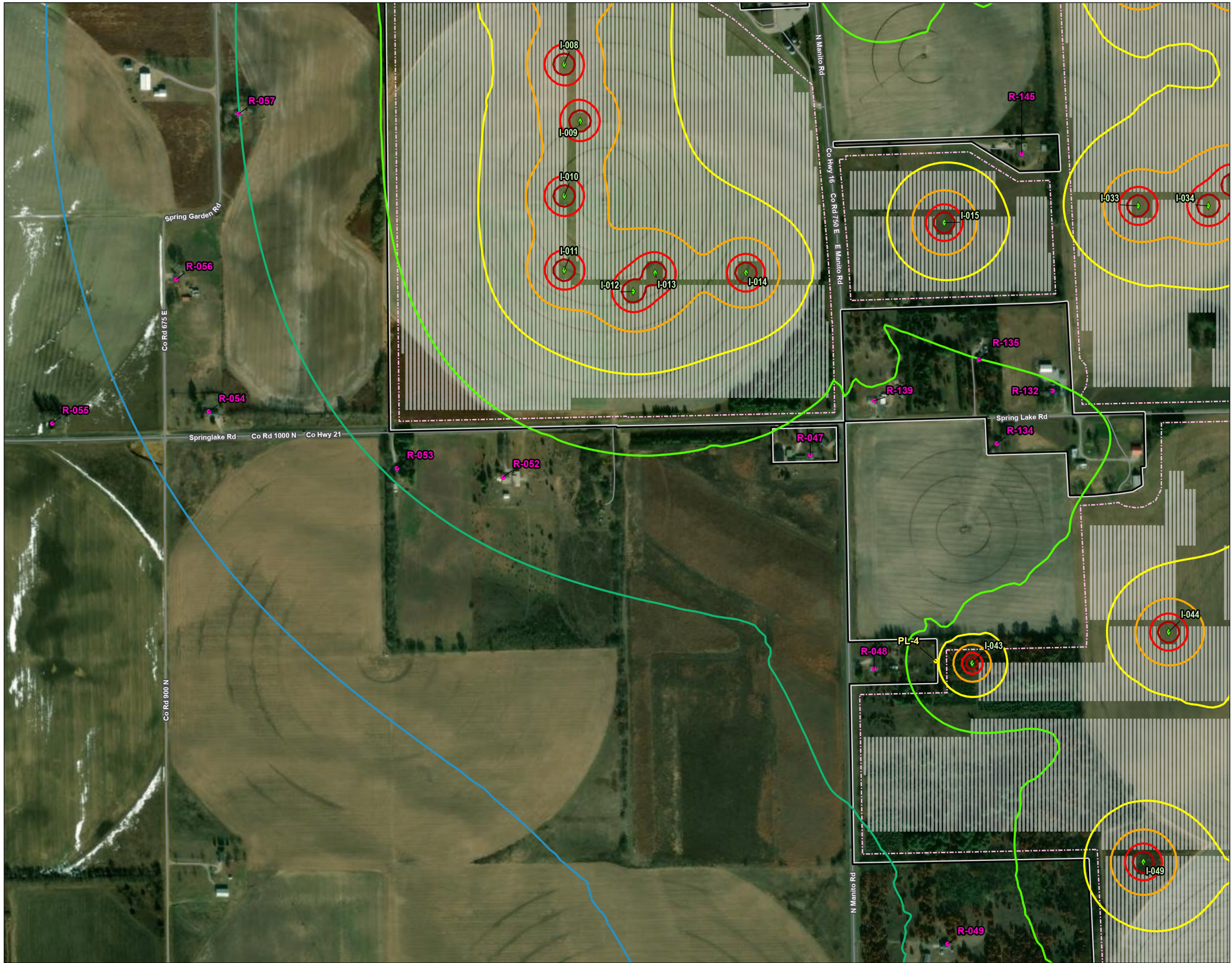


Figure No.
2

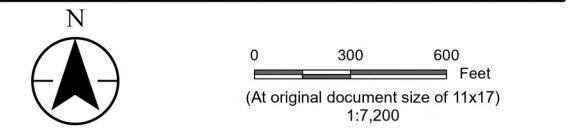
Title
Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

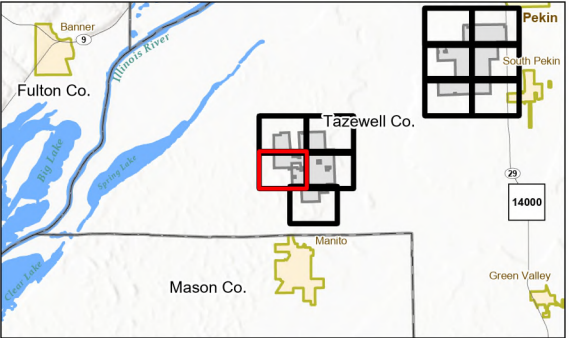
190319031

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



U:\190319031003103_data\gis_cad\gis\ArcPro\Mackinaw Solar\Mackinaw Solar.aprx Revised: 2026-08-12 By: djblin

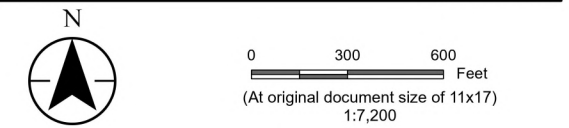


Figure No.
2
Title
**Daytime Operational Sound
Level Contours**

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12

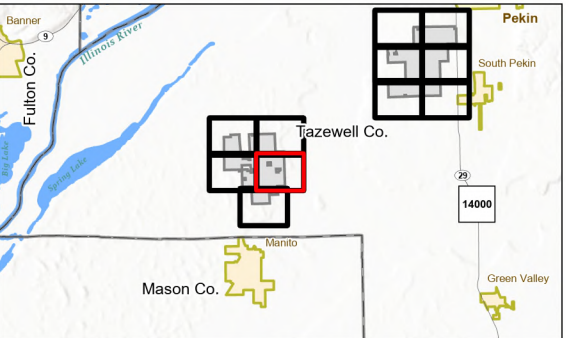


Legend

- Solar Project Area
- Solar PV Array
- Fence
- Solar Inverter
- Substation Transformer
- Sensitive Receptor
- Property Line Receptor

Daytime Sound Level Contours (dBA)

- 35
- 40
- 45
- 50
- 55
- 60
- 65



Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Stantec, Esri, USCB, USGS
3. Background: NAIP 2023



U:\190319031003103_data\gis_cad\gis\ArcPro\ProMackinaw Solar.aprx Revised: 2026-08-12 By: djbilin



Figure No.
2

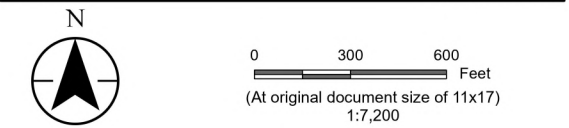
Title
Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

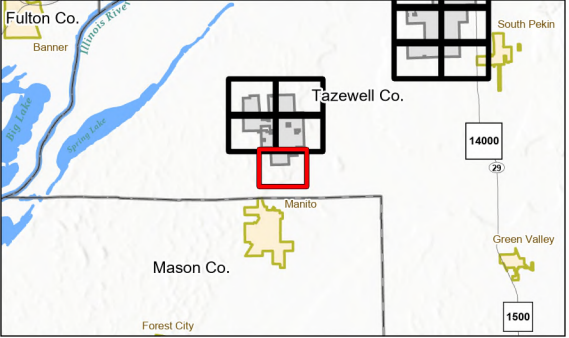
Project Location
Tazewell County,
Illinois

190319031

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



U:\190319031003103_data\gis_cad\gis\ArcPro\Mackinaw Solar.aprx Revised: 2026-08-12 By: djbilin



Figure No.
2

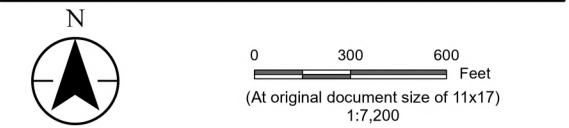
Title
Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

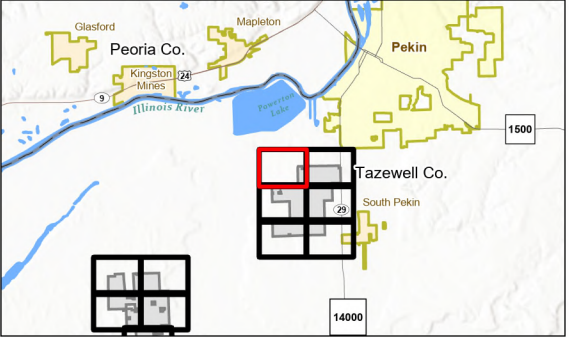
Project Location
Tazewell County,
Illinois

190319031

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



U:\1903190310031003_data\gis_cad\gis\ArcPro\Mackinaw Solar.aprx Revised: 2026-08-12 By: djbilin

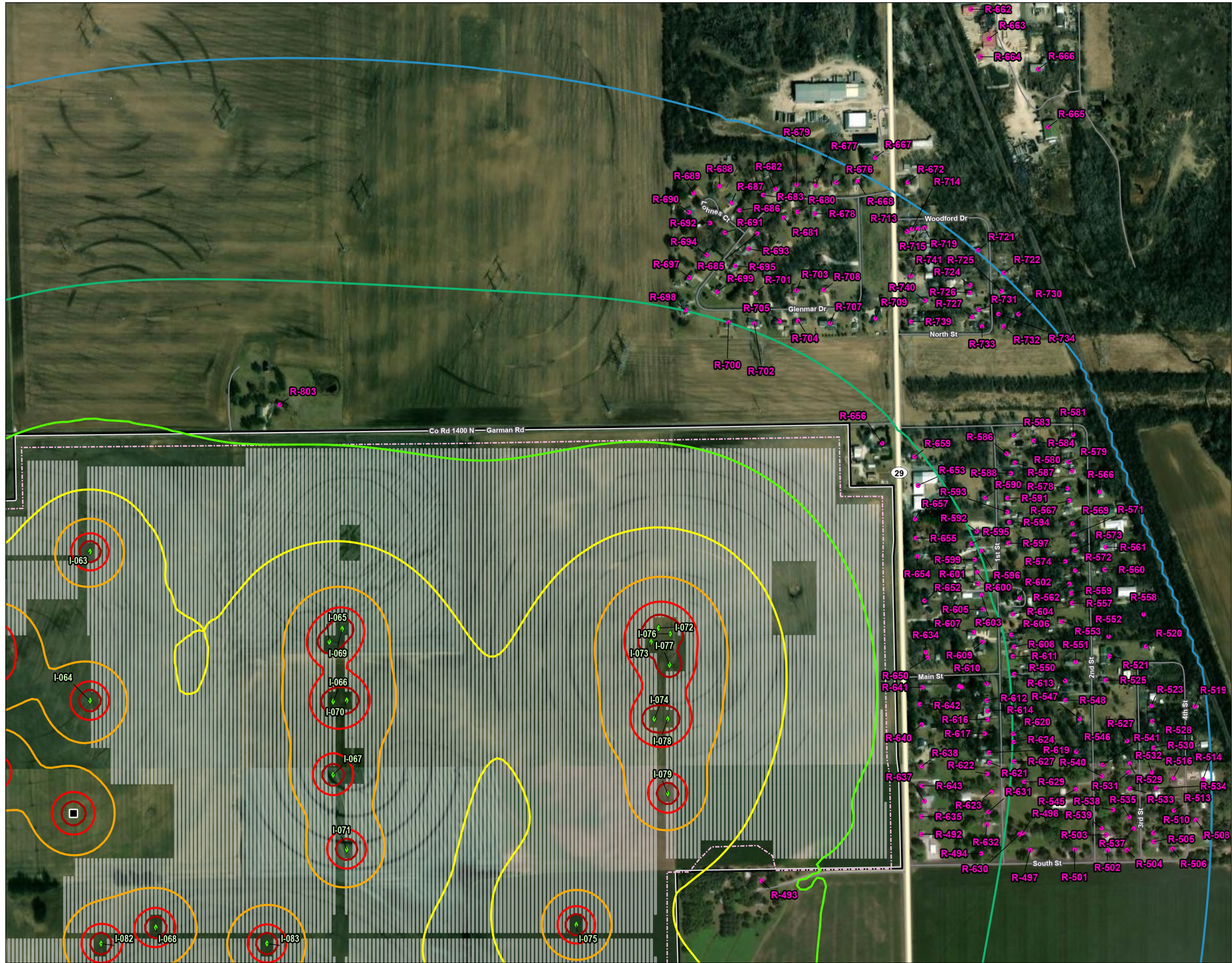


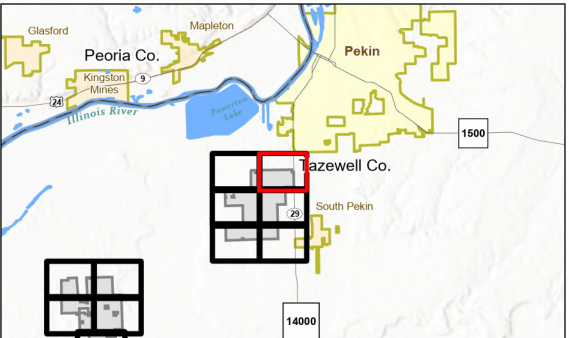
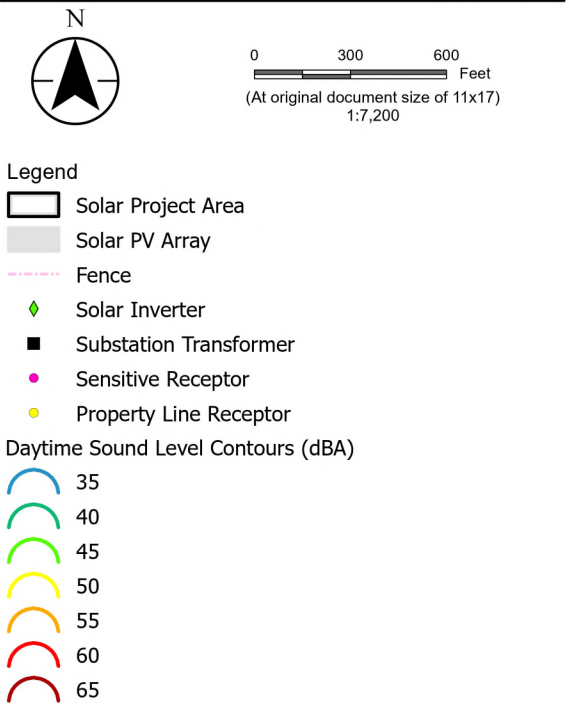
Figure No.
2

Title
Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Stantec, Esri, USCB, USGS
3. Background: NAIP 2023

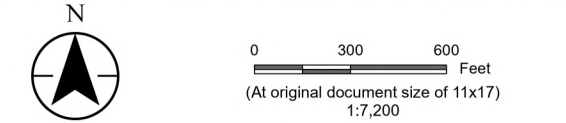




Figure No.
2
Title
**Daytime Operational Sound
Level Contours**

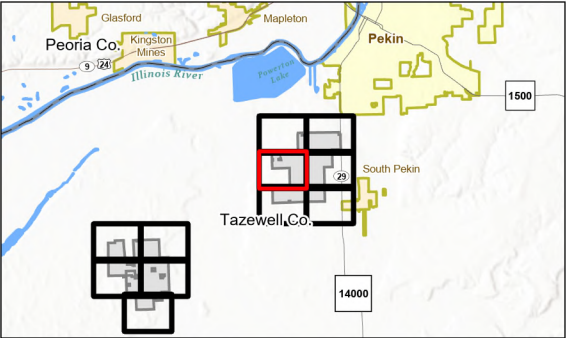
Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project
190319031

Project Location
Tazewell County,
Illinois
Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)

- 35
- 40
- 45
- 50
- 55
- 60
- 65



Notes
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
2. Data Sources: Doral, Stantec, Esri, USCB, USGS
3. Background: NAIP 2023





Figure No.

2

Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

190319031

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



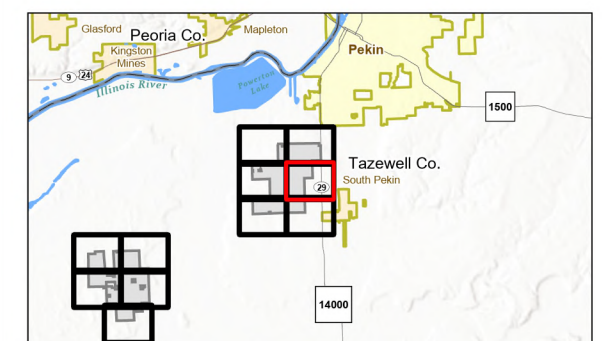
0 300 600 Feet
(At original document size of 11x17)
1:7,200

Legend

-  Solar Project Area
-  Solar PV Array
-  Fence
-  Solar Inverter
-  Substation Transformer
-  Sensitive Receptor
-  Property Line Receptor

Daytime Sound Level Contours (dBA)

- | | |
|---|----|
|  | 35 |
|  | 40 |
|  | 45 |
|  | 50 |
|  | 55 |
|  | 60 |
|  | 65 |



Notes

- Notes**
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
 2. Data Sources: Doral, Stantec, Esri, USCB, USGS
 3. Background: NAIP 2023



U:\190319031003103_data\gis_cad\gis\ArcPro\Mackinaw Solar\Mackinaw Solar.aprx Revised: 2026-08-12 By: djblin



Figure No.
2

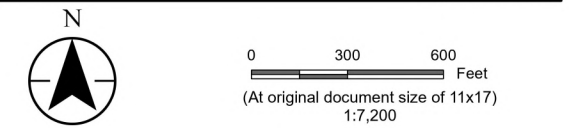
Title
Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

Project Location
Tazewell County,
Illinois

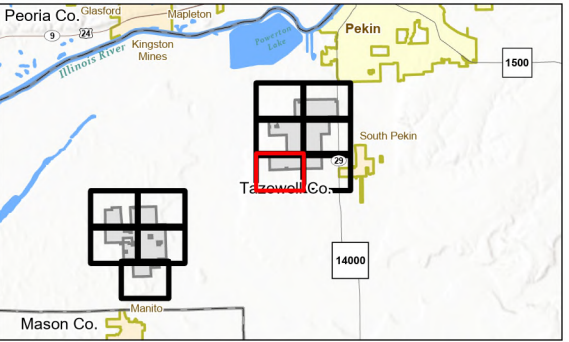
190319031

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)

- 35
- 40
- 45
- 50
- 55
- 60
- 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



U:\19031903100310031003_data\gis_cad\gis\ArcPro\MapMackinaw Solar.aprx Revised: 2026-08-12 By: djbilin



Figure No.
2

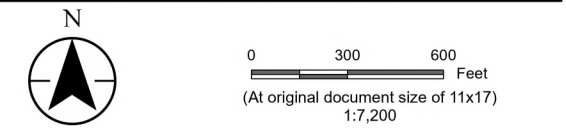
Title
Daytime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

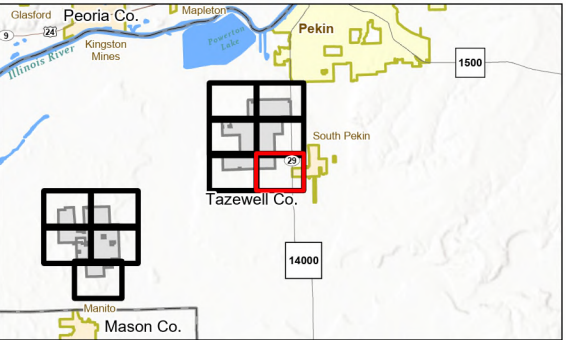
Project Location
Tazewell County,
Illinois

190319031

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Daytime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



Figure 3: Nighttime Operational Sound Level Contours



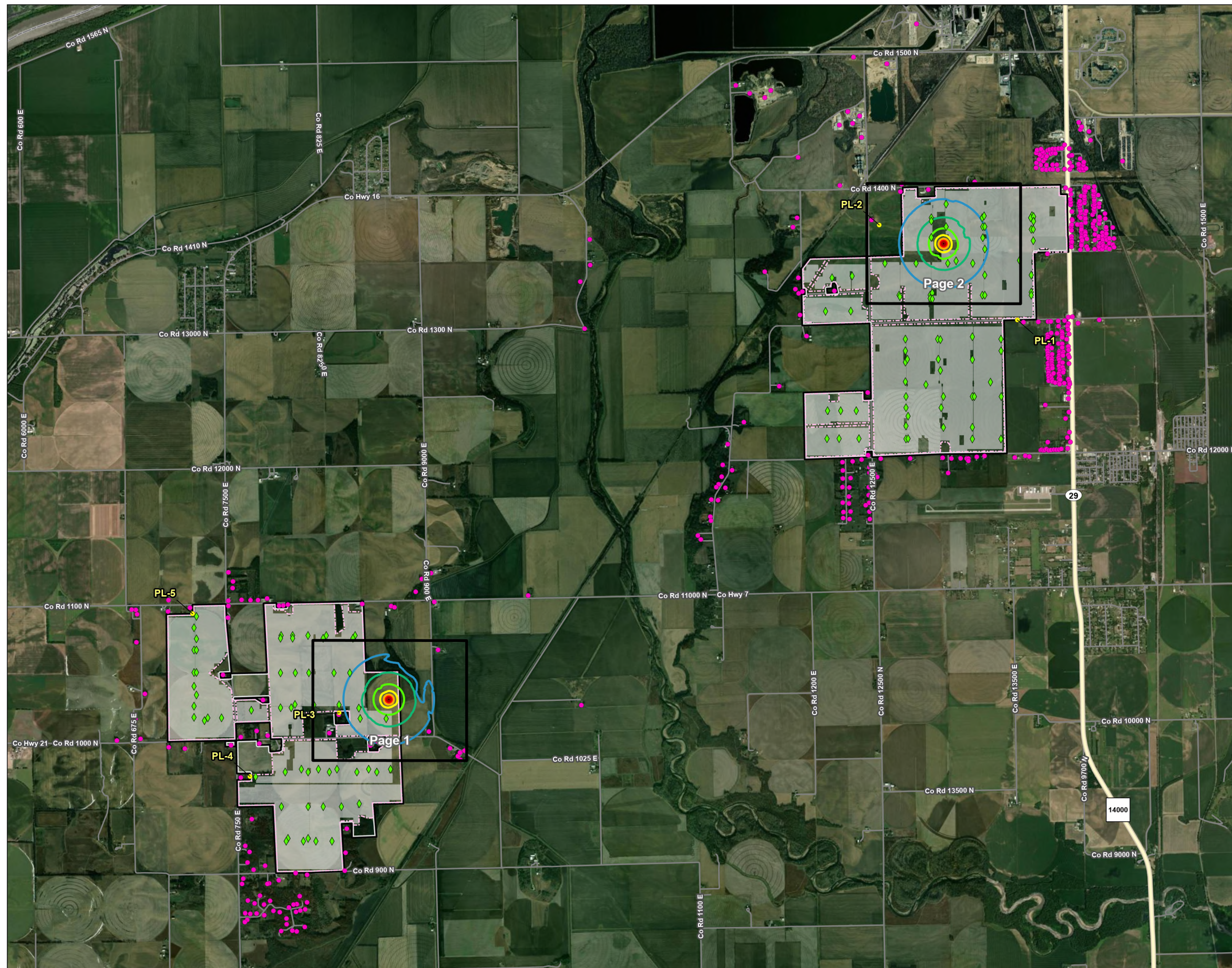


Figure No.

3

Title
**Nighttime Operational Sound
Level Contours**

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

190319031

Project Location
Tazewell County,
Illinois

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



0 2,000 4,000 Feet
(At original document size of 11x17)
1:48,000

Legend

-  Solar Project Area
-  Solar PV Array
-  Fence
-  Solar Inverter
-  Substation Transformer
-  Sensitive Receptor
-  Property Line Receptor

Nighttime Sound Level Contours (dBA)

- | | |
|---|----|
|  | 35 |
|  | 40 |
|  | 45 |
|  | 50 |
|  | 55 |
|  | 60 |
|  | 65 |



Notes

- Notes**
1. Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
 2. Data Sources: Doral, Stantec, Esri, USCB, USGS
 3. Background: NAIP 2023



Index

U:\19031903100310031003_data\gis_cad\gis\ArcPro\MapMackinaw Solar.aprx Revised: 2026-08-12 By: djbilin

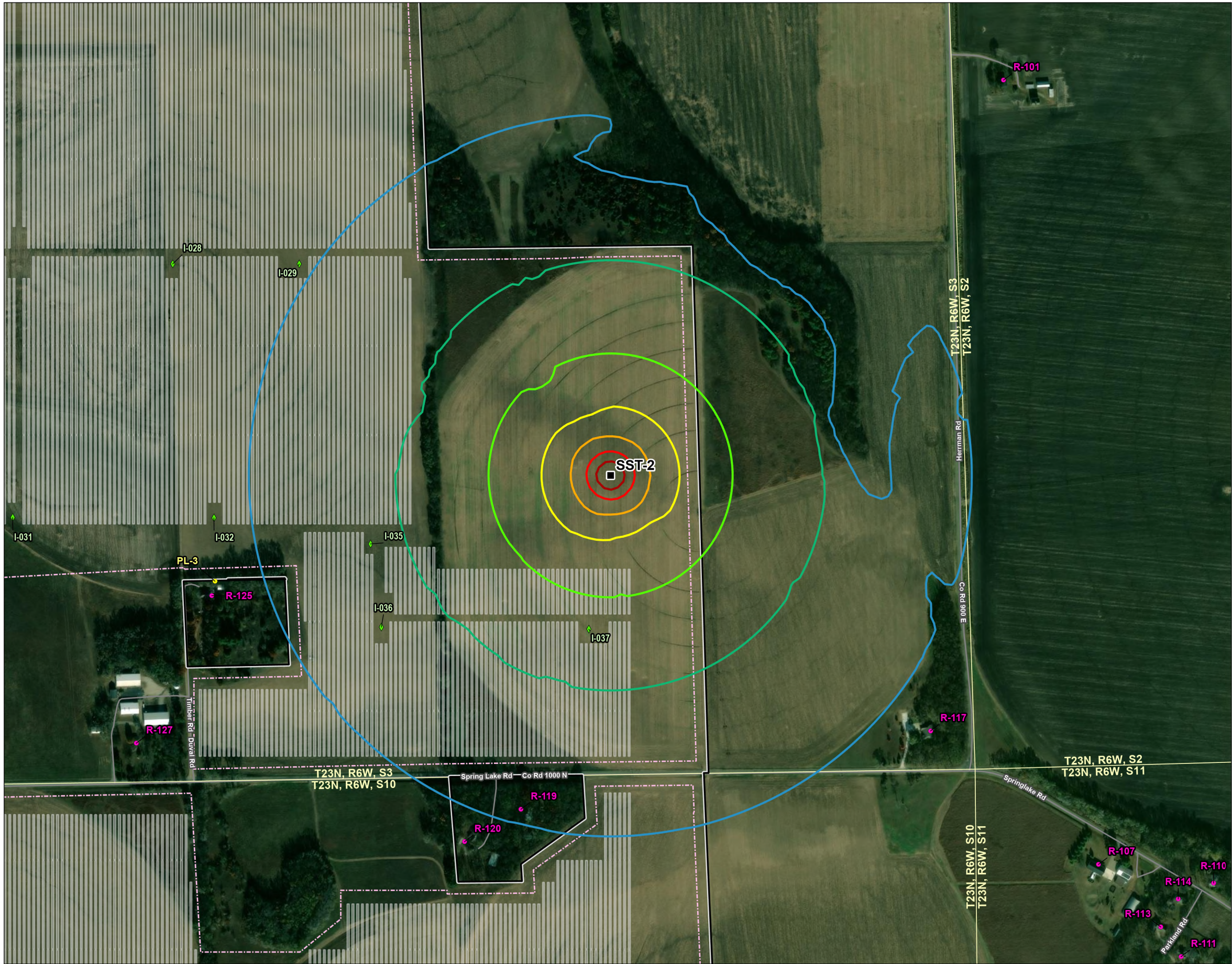


Figure No.
3

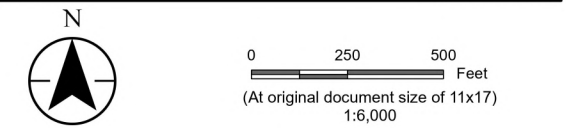
Title
Nighttime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

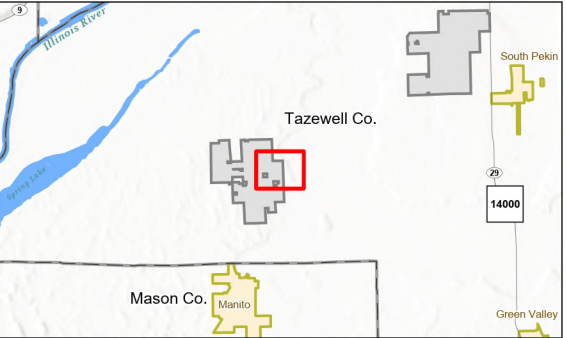
Project Location
Tazewell County,
Illinois

190319031

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Nighttime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



U:\190319031003103_data\gis_cad\gis\ArcPro\Mackinaw Solar\aprx Revised: 2026-08-12 By: djbilin



Figure No.
3

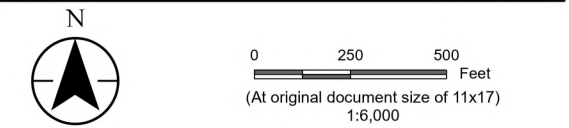
Title
Nighttime Operational Sound Level Contours

Client/Project
Mackinaw Solar LLC
Mackinaw Solar Project

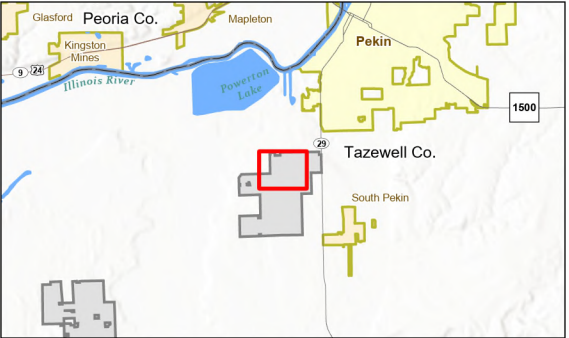
Project Location
Tazewell County,
Illinois

190319031

Prepared by DJG on 2026-08-10
TR by DP on 2026-08-11
IR by ZG on 2026-08-12



- Legend
- Solar Project Area
 - Solar PV Array
 - Fence
 - Solar Inverter
 - Substation Transformer
 - Sensitive Receptor
 - Property Line Receptor
- Nighttime Sound Level Contours (dBA)
- 35
 - 40
 - 45
 - 50
 - 55
 - 60
 - 65



Notes

- Coordinate System: NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Data Sources: Doral, Stantec, Esri, USCB, USGS
- Background: NAIP 2023



Appendix A Project Equipment Locations



Mackinaw Solar - Pre-Construction Sound Assessment
Appendix A - Project Equipment Locations

Source ID	Coordinates (UTM 15N)			Height above ground
	X	Y	Z (ground)	
	m	m	m	
I-001	772,212	4,485,666	149	2.4
I-002	772,188	4,485,530	149	2.4
I-003	772,221	4,485,395	150	2.4
I-004	772,196	4,485,259	149	2.4
I-005	772,225	4,485,260	149	2.4
I-006	772,205	4,484,988	151	2.4
I-007	772,234	4,484,989	151	2.4
I-008	772,211	4,484,821	158	2.4
I-009	772,243	4,484,718	155	2.4
I-010	772,218	4,484,581	154	2.4
I-011	772,223	4,484,446	156	2.4
I-012	772,349	4,484,411	158	3.0
I-013	772,388	4,484,446	158	2.4
I-014	772,554	4,484,452	159	2.4
I-015	772,912	4,484,555	155	2.4
I-016	773,241	4,485,469	153	2.4
I-017	773,380	4,485,474	152	2.4
I-018	773,566	4,485,480	153	2.4
I-019	773,787	4,485,487	156	2.4
I-020	774,136	4,485,498	151	2.4
I-021	773,236	4,485,435	152	2.4
I-022	773,382	4,485,440	152	2.4
I-023	773,750	4,485,452	158	2.4
I-024	774,111	4,485,463	153	2.4
I-025	773,250	4,485,017	151	2.4
I-026	773,427	4,485,023	154	2.4
I-027	773,593	4,485,028	152	2.4
I-028	773,895	4,485,038	150	2.4
I-029	774,086	4,485,044	152	2.4
I-030	773,436	4,484,641	155	2.4
I-031	773,665	4,484,645	149	2.4
I-032	773,970	4,484,655	152	2.4
I-033	773,263	4,484,597	151	2.4
I-034	773,391	4,484,601	155	2.4
I-035	774,208	4,484,623	148	2.4
I-036	774,229	4,484,497	150	2.4
I-037	774,543	4,484,504	153	2.4
I-038	773,539	4,483,862	157	2.4
I-039	773,745	4,483,869	154	2.4
I-040	773,968	4,483,876	154	2.4
I-041	774,351	4,483,889	155	2.4
I-042	774,615	4,483,897	151	2.4

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix A - Project Equipment Locations

Source ID	Coordinates (UTM 15N)			Height above ground
	X	Y	Z (ground)	
	m	m	m	
I-043	772,988	4,483,754	153	2.4
I-044	773,344	4,483,822	151	2.4
I-045	773,621	4,483,831	158	2.4
I-046	773,879	4,483,839	153	2.4
I-047	774,210	4,483,850	159	2.4
I-048	774,452	4,483,858	150	2.4
I-049	773,312	4,483,402	152	2.4
I-050	773,635	4,483,413	159	2.4
I-051	773,816	4,483,419	155	2.4
I-052	774,037	4,483,426	153	2.4
I-053	774,251	4,483,467	151	2.4
I-054	773,405	4,483,021	157	2.4
I-055	773,647	4,483,028	155	2.4
I-056	773,384	4,482,986	162	2.4
I-057	773,592	4,482,993	155	2.4
I-058	773,743	4,482,998	155	2.4
I-059	773,937	4,483,004	155	2.4
I-060	780,934	4,490,767	162	2.4
I-061	780,935	4,490,728	162	2.4
I-062	780,941	4,490,530	164	2.4
I-063	781,107	4,490,937	166	2.4
I-064	781,116	4,490,666	165	2.4
I-065	781,548	4,490,787	159	2.4
I-066	781,558	4,490,678	157	2.4
I-067	781,563	4,490,545	156	2.4
I-068	781,249	4,490,257	164	2.4
I-069	781,571	4,490,811	158	2.4
I-070	781,583	4,490,681	156	2.4
I-071	781,592	4,490,410	157	2.4
I-072	782,146	4,490,831	158	2.4
I-073	782,133	4,490,806	158	2.4
I-074	782,144	4,490,665	157	2.4
I-075	782,014	4,490,286	152	2.4
I-076	782,168	4,490,822	158	2.4
I-077	782,169	4,490,765	158	2.4
I-078	782,168	4,490,666	158	2.4
I-079	782,173	4,490,531	156	2.4
I-080	780,391	4,490,200	160	2.4
I-081	780,766	4,490,212	165	2.4
I-082	781,150	4,490,224	164	2.4
I-083	781,452	4,490,234	160	2.4
I-084	781,601	4,490,096	162	2.4

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix A - Project Equipment Locations

Source ID	Coordinates (UTM 15N)			Height above ground
	X	Y	Z (ground)	
	m	m	m	
I-085	782,162	4,490,114	153	2.4
I-086	782,168	4,489,908	153	2.4
I-087	780,574	4,489,819	162	2.4
I-088	780,584	4,489,801	162	2.4
I-089	780,950	4,489,835	163	2.4
I-090	780,951	4,489,792	162	2.4
I-091	780,973	4,489,859	163	2.4
I-092	780,976	4,489,786	163	2.4
I-093	781,579	4,489,852	161	2.4
I-094	781,609	4,489,853	161	2.4
I-095	782,169	4,489,871	153	2.4
I-096	779,999	4,490,033	158	2.4
I-097	779,757	4,490,004	159	2.4
I-098	779,692	4,489,596	159	2.4
I-099	779,996	4,489,608	158	2.4
I-100	780,667	4,489,291	162	2.4
I-101	780,672	4,489,150	161	2.4
I-102	781,058	4,489,304	162	2.4
I-103	781,089	4,489,300	162	2.4
I-104	781,475	4,489,345	163	2.4
I-105	781,822	4,489,328	160	2.4
I-106	780,676	4,489,013	161	2.4
I-107	780,684	4,488,777	159	2.4
I-108	780,700	4,489,049	161	2.4
I-109	781,072	4,489,061	162	2.4
I-110	781,101	4,488,927	162	2.4
I-111	781,484	4,489,070	162	2.4
I-112	781,828	4,489,187	160	2.4
I-113	781,711	4,488,804	161	2.4
I-114	780,696	4,488,598	160	2.4
I-115	780,932	4,488,748	160	2.4
I-116	781,148	4,488,612	162	2.4
I-117	781,497	4,488,623	160	2.4
I-118	781,524	4,488,624	161	2.4
I-119	781,846	4,488,635	161	2.4
I-120	780,700	4,488,463	162	2.4
I-121	780,708	4,488,242	161	2.4
I-122	780,729	4,488,361	162	2.4
I-123	781,126	4,488,477	159	2.4
I-124	780,713	4,488,084	161	2.4
I-125	780,738	4,488,090	161	2.4
I-126	781,160	4,488,239	160	2.4

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix A - Project Equipment Locations

Source ID	Coordinates (UTM 15N)			Height above ground
	X	Y	Z (ground)	
	m	m	m	
I-127	781,509	4,488,252	159	2.4
I-128	781,514	4,488,110	158	2.4
I-129	781,860	4,488,122	160	2.4
I-130	779,754	4,488,397	155	2.4
I-131	779,913	4,488,402	155	2.4
I-132	780,101	4,488,408	155	2.4
I-133	779,759	4,488,058	154	2.4
I-134	779,906	4,488,063	155	2.4
I-135	780,144	4,488,071	154	2.4
SST-1	781,092	4,490,460	166	3.0
SST-2	774,568	4,484,739	157	3.0

Notes: SST = Substation Transformer
I = Inverter

Appendix B Receptor Locations and Daytime Operational Noise Modeling Results



Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-062*	37	45	34	29	32	30	32	6	0	36	771,494	4,485,671	157	1.5
R-260*	41	50	40	34	38	37	41	24	0	44	780,416	4,487,838	156	1.5
R-767*	39	48	38	32	36	34	38	22	0	41	779,404	4,489,825	158	1.5
R-778*	36	43	32	26	29	24	19	0	0	29	779,300	4,491,444	143	1.5
R-064*	38	47	36	30	34	33	36	17	0	39	771,869	4,485,853	155	1.5
R-067*	38	47	37	32	36	34	38	21	0	41	771,867	4,485,716	156	1.5
R-068*	40	48	37	32	36	34	37	16	0	41	772,594	4,485,806	153	1.5
R-075*	40	48	38	32	36	35	38	18	0	41	773,060	4,485,911	156	1.5
R-314*	37	45	34	28	31	28	28	0	0	34	782,669	4,488,033	162	1.5
R-325*	36	44	32	27	29	26	24	0	0	31	783,222	4,491,526	152	1.5
R-344*	38	47	35	30	33	30	30	1	0	36	782,659	4,488,637	159	1.5
R-459*	39	47	36	31	34	31	31	2	0	37	782,651	4,489,060	157	1.5
R-460*	40	48	37	31	35	33	33	8	0	38	782,616	4,489,353	156	1.5
R-461*	39	48	36	31	34	32	33	8	0	38	782,746	4,489,549	157	1.5
R-653*	40	48	38	32	36	34	37	17	0	41	782,610	4,491,106	157	1.5
R-662*	36	44	33	27	30	26	24	0	0	31	782,679	4,491,977	147	1.5
R-663*	36	44	33	27	30	26	24	0	0	32	782,714	4,491,924	146	1.5
R-664*	36	44	33	27	30	27	25	0	0	32	782,699	4,491,891	145	1.5
R-665*	36	44	33	27	30	27	25	0	0	32	782,827	4,491,766	147	1.5
R-666*	36	44	33	27	30	26	24	0	0	31	782,805	4,491,871	147	1.5
R-722*	38	46	34	29	32	29	30	0	0	35	782,754	4,491,498	146	1.5
R-741*	38	46	35	30	33	31	32	5	0	36	782,585	4,491,487	146	1.5
R-777*	33	41	29	23	25	19	9	0	0	25	778,874	4,492,154	143	1.5
R-780*	36	43	32	26	29	25	19	0	0	30	779,786	4,491,851	142	1.5
R-781*	35	43	32	26	28	24	18	0	0	29	779,883	4,492,017	141	1.5
R-782*	36	44	33	27	29	25	20	0	0	30	780,029	4,491,969	147	1.5
R-783*	36	44	33	27	29	25	20	0	0	30	779,946	4,491,877	146	1.5
R-784*	37	45	34	28	31	27	23	0	0	32	780,059	4,491,711	146	1.5
R-785*	34	42	31	25	27	22	14	0	0	27	780,335	4,492,609	142	1.5
R-792*	38	46	35	29	32	29	27	0	0	34	779,815	4,491,123	149	1.5
R-811*	33	40	29	22	24	18	7	0	0	24	778,692	4,492,198	143	1.5
R-812*	33	41	29	23	25	19	8	0	0	25	778,944	4,492,242	142	1.5
R-088*	39	47	37	31	34	32	33	10	0	38	774,600	4,485,853	151	1.5
R-231*	41	49	40	34	38	37	42	27	0	45	780,185	4,487,819	158	1.5
R-731*	38	46	35	30	33	30	31	4	0	36	782,711	4,491,430	146	1.5
R-786*	33	41	29	23	25	19	10	0	0	25	780,679	4,493,103	142	1.5
PL-1	43	52	42	36	40	39	43	27	0	46	782,012	4,489,566	158	1.5
PL-2	42	50	40	34	38	35	37	16	0	42	780,308	4,490,660	161	1.5
PL-3	44	52	44	39	42	41	46	36	0	49	773,974	4,484,559	157	1.5
PL-4	42	50	42	38	42	41	47	38	3	49	772,922	4,483,756	155	1.5
PL-5	44	52	44	38	42	41	47	38	3	50	772,165	4,485,699	152	1.5
R-061	37	45	34	28	32	30	31	5	0	35	771,477	4,485,723	158	1.5
R-458	39	47	35	30	34	31	31	1	0	36	782,650	4,488,871	158	1.5
R-592	40	48	37	32	35	33	36	14	0	40	782,720	4,491,026	157	1.5
R-002	40	48	39	33	37	36	40	23	0	43	773,510	4,482,605	167	1.5
R-004	40	48	38	33	37	36	40	23	0	43	773,649	4,482,590	166	1.5
R-005	42	50	42	36	40	39	44	30	0	47	774,111	4,483,162	158	1.5
R-007	39	47	37	32	36	34	38	20	0	41	774,102	4,482,655	157	1.5
R-008	41	49	40	35	39	37	42	29	0	45	774,105	4,482,871	163	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-009	39	47	37	31	35	33	36	16	0	40	773,308	4,482,512	161	1.5
R-010	38	46	36	30	34	32	34	11	0	38	773,173	4,482,465	159	1.5
R-011	38	46	36	30	34	32	34	12	0	38	773,195	4,482,471	160	1.5
R-012	39	47	37	32	35	33	37	19	0	40	773,139	4,482,682	154	1.5
R-013	38	47	36	30	34	32	34	12	0	38	773,002	4,482,629	154	1.5
R-014	37	45	34	29	32	30	31	5	0	36	772,880	4,482,518	158	1.5
R-015	37	45	34	29	32	29	30	3	0	35	772,867	4,482,455	159	1.5
R-016	36	44	33	28	31	28	28	0	0	33	772,944	4,482,256	153	1.5
R-017	36	44	32	27	30	27	26	0	0	32	772,917	4,482,102	153	1.5
R-018	36	44	32	27	30	27	26	0	0	32	772,978	4,482,095	153	1.5
R-019	35	43	32	26	29	26	24	0	0	31	772,916	4,481,994	152	1.5
R-020	35	43	32	26	29	26	25	0	0	31	772,944	4,482,022	152	1.5
R-021	36	44	33	27	30	27	27	0	0	33	773,148	4,482,085	155	1.5
R-022	36	44	32	27	30	27	27	0	0	33	773,055	4,482,102	153	1.5
R-023	37	45	34	29	32	30	31	4	0	35	773,088	4,482,318	163	1.5
R-024	36	44	33	28	31	28	28	0	0	33	773,025	4,482,224	155	1.5
R-025	37	45	33	28	31	29	30	2	0	35	773,141	4,482,213	161	1.5
R-026	37	45	34	29	32	30	31	5	0	36	773,213	4,482,261	163	1.5
R-027	37	45	33	28	31	29	29	1	0	34	773,333	4,482,127	167	1.5
R-028	37	45	33	28	31	29	29	1	0	34	773,257	4,482,141	165	1.5
R-029	37	45	34	28	32	29	30	2	0	35	773,530	4,482,137	158	1.5
R-030	37	45	34	29	32	30	31	4	0	36	773,443	4,482,188	160	1.5
R-031	37	45	34	28	32	30	31	3	0	35	773,580	4,482,155	159	1.5
R-032	37	46	34	29	32	30	32	6	0	36	773,497	4,482,225	158	1.5
R-033	37	45	34	29	32	30	31	4	0	36	773,640	4,482,172	159	1.5
R-034	37	46	34	29	33	30	32	6	0	36	773,539	4,482,229	158	1.5
R-035	38	46	35	29	33	31	33	7	0	37	773,659	4,482,256	158	1.5
R-036	38	46	35	30	34	32	34	10	0	38	773,570	4,482,328	161	1.5
R-037	38	46	35	30	34	32	34	10	0	38	773,569	4,482,329	161	1.5
R-038	38	46	34	29	33	30	32	6	0	36	773,536	4,482,231	158	1.5
R-039	36	44	33	28	31	28	29	0	0	34	773,416	4,482,054	165	1.5
R-040	36	44	32	27	30	27	26	0	0	32	773,494	4,481,909	160	1.5
R-041	36	44	32	27	30	27	26	0	0	32	773,547	4,481,901	161	1.5
R-042	35	44	32	27	30	27	26	0	0	32	773,358	4,481,900	160	1.5
R-043	36	44	32	27	30	27	27	0	0	33	773,642	4,481,959	156	1.5
R-044	36	44	32	27	30	28	27	0	0	33	773,422	4,481,984	162	1.5
R-046	38	47	36	30	34	32	34	12	0	38	772,925	4,482,715	157	1.5
R-047	42	50	40	34	38	37	41	23	0	44	772,681	4,484,123	160	1.5
R-048	41	49	39	34	37	36	40	26	0	43	772,810	4,483,738	158	1.5
R-049	40	49	38	33	37	35	39	20	0	42	772,960	4,483,241	163	1.5
R-050	39	47	37	31	35	33	35	14	0	39	772,892	4,482,914	166	1.5
R-051	39	47	37	31	35	33	36	16	0	39	772,946	4,482,844	165	1.5
R-052	40	49	39	33	37	36	39	22	0	43	772,124	4,484,065	159	1.5
R-053	40	48	37	32	36	34	37	17	0	40	771,930	4,484,075	155	1.5
R-054	38	46	35	30	33	31	32	7	0	37	771,584	4,484,168	154	1.5
R-055	36	44	33	28	31	28	28	0	0	33	771,300	4,484,137	156	1.5
R-056	37	46	35	30	33	31	33	8	0	37	771,517	4,484,406	157	1.5
R-057	39	47	37	31	35	34	36	14	0	40	771,621	4,484,711	154	1.5
R-060	38	46	35	30	34	32	34	9	0	38	771,497	4,485,331	157	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-063	37	45	33	28	31	29	30	3	0	35	771,427	4,485,723	158	1.5
R-066	41	49	40	34	38	37	42	30	0	45	772,131	4,485,769	156	1.5
R-069	39	48	37	32	35	34	36	15	0	40	772,592	4,485,870	154	1.5
R-070	39	47	36	31	34	32	34	9	0	38	772,638	4,486,023	153	1.5
R-072	40	48	37	32	35	33	36	12	0	40	772,752	4,485,885	154	1.5
R-073	40	48	37	32	36	34	36	14	0	40	772,858	4,485,884	155	1.5
R-074	40	48	38	32	36	34	37	16	0	41	772,949	4,485,888	156	1.5
R-076	41	50	40	34	38	37	41	24	0	44	773,206	4,485,828	157	1.5
R-077	41	50	40	34	38	37	41	25	0	44	773,257	4,485,833	157	1.5
R-078	41	50	40	34	38	37	41	24	0	44	773,313	4,485,845	157	1.5
R-080	40	48	39	33	36	35	38	20	0	41	774,210	4,485,882	152	1.5
R-085	37	45	34	29	32	28	27	0	0	34	774,850	4,486,050	153	1.5
R-086	39	47	37	31	34	32	33	12	0	38	774,560	4,485,867	151	1.5
R-089	36	44	33	28	30	27	24	0	0	32	774,921	4,486,208	150	1.5
R-090	36	43	33	27	30	26	22	0	0	31	775,028	4,486,282	151	1.5
R-094	38	46	35	30	34	31	32	6	0	37	772,639	4,486,103	154	1.5
R-096	38	46	34	29	33	30	31	3	0	36	772,583	4,486,212	154	1.5
R-097	37	44	34	28	31	27	25	0	0	33	775,079	4,485,934	142	1.5
R-101	39	46	37	31	34	30	28	0	0	35	775,144	4,485,357	143	1.5
R-107	39	46	37	31	34	30	30	3	0	36	775,326	4,484,173	150	1.5
R-110	37	45	35	30	32	29	27	0	0	34	775,502	4,484,150	149	1.5
R-111	38	45	35	30	32	29	28	0	0	34	775,456	4,484,037	150	1.5
R-113	38	46	36	30	33	29	28	0	0	35	775,424	4,484,081	150	1.5
R-114	38	45	36	30	33	29	28	0	0	35	775,449	4,484,124	150	1.5
R-117	39	47	40	34	37	34	34	12	0	39	775,066	4,484,367	156	1.5
R-119	43	51	44	37	41	39	43	27	0	46	774,449	4,484,228	157	1.5
R-120	43	51	43	37	41	39	44	29	0	47	774,365	4,484,176	159	1.5
R-125	44	52	44	38	42	40	45	33	0	48	773,970	4,484,537	157	1.5
R-127	43	51	42	37	40	39	43	25	0	46	773,863	4,484,310	158	1.5
R-132	43	51	41	35	39	38	42	24	0	45	773,118	4,484,255	154	1.5
R-134	42	50	40	35	39	37	40	21	0	44	773,020	4,484,155	151	1.5
R-135	42	51	41	35	39	38	42	27	0	45	772,983	4,484,307	153	1.5
R-139	42	50	40	35	39	37	41	24	0	44	772,795	4,484,226	159	1.5
R-145	44	52	43	37	41	40	45	33	0	48	773,049	4,484,684	157	1.5
R-148	43	51	42	36	40	39	43	27	0	46	772,555	4,484,972	157	1.5
R-150	41	49	39	33	37	36	39	20	0	42	772,593	4,485,664	156	1.5
R-153	32	40	29	23	24	18	7	0	0	24	776,896	4,484,744	144	1.5
R-156	33	41	30	24	25	20	10	0	0	26	776,210	4,486,047	142	1.5
R-159	33	40	29	22	24	18	10	0	0	24	778,275	4,486,793	154	1.5
R-161	33	40	29	22	24	18	10	0	0	24	778,238	4,486,838	153	1.5
R-163	33	41	29	23	25	20	14	0	0	26	778,381	4,487,072	156	1.5
R-164	33	41	29	23	25	20	14	0	0	25	778,389	4,487,024	157	1.5
R-169	34	42	30	24	26	21	17	0	0	27	778,466	4,487,273	156	1.5
R-171	34	41	30	23	26	21	16	0	0	26	778,387	4,487,277	155	1.5
R-175	34	42	30	24	26	22	17	0	0	27	778,441	4,487,430	149	1.5
R-176	34	42	30	24	26	22	18	0	0	27	778,468	4,487,466	152	1.5
R-177	34	42	30	24	27	23	19	0	0	28	778,551	4,487,426	157	1.5
R-180	34	42	30	24	27	23	19	0	0	28	778,501	4,487,559	154	1.5
R-183	35	42	31	25	27	23	20	0	0	29	778,510	4,487,702	155	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-184	35	43	31	25	28	24	21	0	0	29	778,626	4,487,641	158	1.5
R-186	35	43	31	25	28	24	22	0	0	30	778,562	4,487,953	156	1.5
R-192	36	44	32	27	30	27	25	0	0	32	778,750	4,488,227	156	1.5
R-195	41	49	40	34	38	37	41	27	0	44	779,955	4,487,782	159	1.5
R-197	41	49	40	34	38	37	41	27	0	44	780,079	4,487,794	159	1.5
R-198	40	48	38	32	36	35	39	22	0	42	779,962	4,487,681	160	1.5
R-205	39	47	37	31	35	33	36	17	0	40	779,966	4,487,583	160	1.5
R-207	39	48	37	31	35	34	37	17	0	40	780,058	4,487,591	159	1.5
R-209	39	47	36	30	34	32	34	12	0	38	780,048	4,487,479	160	1.5
R-211	39	47	36	30	34	32	34	12	0	38	779,966	4,487,480	160	1.5
R-216	38	46	35	30	33	31	32	7	0	37	780,045	4,487,368	160	1.5
R-218	38	46	34	29	32	30	31	4	0	36	779,974	4,487,292	159	1.5
R-219	38	46	34	29	32	30	31	4	0	36	780,051	4,487,285	160	1.5
R-223	37	45	33	28	31	29	29	0	0	34	779,986	4,487,178	159	1.5
R-224	37	45	34	28	32	29	29	0	0	34	780,073	4,487,188	159	1.5
R-226	37	45	33	28	31	28	28	0	0	33	780,062	4,487,096	159	1.5
R-228	37	45	33	28	31	28	28	0	0	33	779,986	4,487,106	158	1.5
R-234	42	50	40	35	39	38	42	28	0	45	780,262	4,487,875	157	1.5
R-235	40	49	39	33	37	35	39	21	0	42	780,282	4,487,729	159	1.5
R-239	40	48	38	32	36	35	38	18	0	41	780,285	4,487,663	159	1.5
R-243	40	48	38	32	36	34	37	17	0	41	780,344	4,487,653	158	1.5
R-244	39	47	36	31	34	32	34	11	0	39	780,284	4,487,489	159	1.5
R-248	40	48	37	32	36	34	37	15	0	40	780,381	4,487,616	158	1.5
R-250	39	47	35	30	34	31	33	7	0	37	780,284	4,487,393	159	1.5
R-253	38	46	35	29	33	30	31	3	0	36	780,294	4,487,300	157	1.5
R-254	38	46	34	29	33	30	31	2	0	36	780,252	4,487,270	158	1.5
R-255	37	46	34	29	32	29	29	0	0	35	780,299	4,487,195	157	1.5
R-257	37	45	33	28	31	29	28	0	0	34	780,308	4,487,104	157	1.5
R-261	41	50	41	36	40	39	44	30	0	46	780,772	4,487,852	165	1.5
R-269	41	49	40	34	38	37	41	23	0	44	781,163	4,487,873	165	1.5
R-271	40	49	38	32	36	35	37	16	0	41	781,237	4,487,691	162	1.5
R-272	42	50	40	34	38	37	41	24	0	44	781,270	4,487,869	163	1.5
R-275	42	50	40	34	38	37	41	26	0	44	781,380	4,487,873	160	1.5
R-278	42	50	41	34	39	37	42	27	0	45	781,454	4,487,873	160	1.5
R-279	42	50	40	34	38	37	41	26	0	44	781,476	4,487,846	160	1.5
R-280	42	50	41	34	39	37	42	28	0	45	781,475	4,487,872	159	1.5
R-282	42	50	41	35	39	38	43	29	0	45	781,574	4,487,896	159	1.5
R-286	42	50	40	35	39	38	42	28	0	45	781,670	4,487,911	162	1.5
R-287	40	49	38	32	36	35	39	24	0	42	782,034	4,487,905	162	1.5
R-290	39	47	37	31	35	33	37	20	0	40	782,161	4,487,930	162	1.5
R-294	39	47	36	31	35	33	35	17	0	39	782,211	4,487,921	162	1.5
R-296	39	47	36	30	34	31	33	12	0	37	782,355	4,488,008	161	1.5
R-299	38	46	35	30	33	31	32	10	0	37	782,413	4,488,017	161	1.5
R-300	38	46	35	30	33	30	32	8	0	36	782,442	4,488,005	161	1.5
R-301	38	47	35	30	33	31	32	10	0	37	782,395	4,488,006	161	1.5
R-303	38	47	35	30	33	31	33	11	0	37	782,375	4,488,003	161	1.5
R-304	39	47	36	30	34	32	33	13	0	38	782,344	4,488,003	161	1.5
R-306	38	46	35	29	33	30	31	7	0	36	782,469	4,488,008	161	1.5
R-307	38	46	34	29	32	30	31	6	0	36	782,502	4,488,013	161	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-309	38	46	34	29	32	30	30	4	0	35	782,533	4,488,015	162	1.5
R-311	38	46	34	29	32	29	29	3	0	35	782,564	4,488,016	162	1.5
R-312	38	46	34	29	32	29	29	2	0	35	782,593	4,488,026	162	1.5
R-326	38	47	35	30	33	31	32	10	0	37	782,427	4,488,102	163	1.5
R-328	37	45	34	28	31	29	28	0	0	34	782,699	4,488,113	162	1.5
R-329	38	46	34	29	32	29	29	0	0	34	782,662	4,488,166	162	1.5
R-331	39	47	35	30	33	31	30	0	0	36	782,670	4,488,814	158	1.5
R-333	39	47	36	30	34	31	31	3	0	37	782,603	4,488,822	159	1.5
R-334	38	46	34	29	32	29	29	0	0	34	782,685	4,488,231	158	1.5
R-337	39	47	36	31	34	32	32	5	0	37	782,549	4,488,809	159	1.5
R-339	38	46	35	29	33	30	30	1	0	35	782,632	4,488,395	157	1.5
R-341	38	46	35	29	33	30	30	0	0	35	782,670	4,488,475	157	1.5
R-345	38	47	35	30	33	31	30	1	0	36	782,657	4,488,774	159	1.5
R-351	39	47	35	30	33	30	30	1	0	36	782,661	4,488,707	160	1.5
R-353	40	48	36	31	35	32	33	7	0	38	782,495	4,488,824	159	1.5
R-355	40	48	37	31	35	33	34	9	0	38	782,460	4,488,837	158	1.5
R-356	40	48	37	31	35	33	34	9	0	39	782,453	4,488,865	158	1.5
R-357	40	48	37	32	35	33	35	11	0	39	782,414	4,488,843	158	1.5
R-358	40	48	37	32	35	33	34	9	0	39	782,447	4,488,910	158	1.5
R-360	40	48	37	31	35	33	34	8	0	38	782,471	4,488,936	160	1.5
R-361	40	48	37	32	35	33	35	10	0	39	782,416	4,488,876	158	1.5
R-363	40	48	37	32	35	33	35	11	0	39	782,410	4,488,906	158	1.5
R-366	40	48	37	32	35	33	35	11	0	39	782,409	4,488,941	158	1.5
R-367	40	48	37	32	35	33	34	9	0	39	782,454	4,488,998	160	1.5
R-370	40	48	37	32	35	33	35	11	0	39	782,411	4,488,968	159	1.5
R-371	40	48	37	32	35	33	34	9	0	39	782,452	4,489,024	160	1.5
R-372	40	48	37	32	35	33	34	10	0	39	782,444	4,489,039	160	1.5
R-374	40	48	37	32	36	33	35	11	0	39	782,400	4,488,990	159	1.5
R-375	40	48	37	32	36	34	35	11	0	39	782,403	4,489,033	159	1.5
R-378	40	49	37	32	36	34	35	12	0	40	782,398	4,489,058	160	1.5
R-379	40	48	37	32	35	33	35	10	0	39	782,444	4,489,059	160	1.5
R-380	40	48	37	32	35	33	35	10	0	39	782,438	4,489,077	160	1.5
R-381	40	48	37	32	36	33	35	10	0	39	782,445	4,489,117	158	1.5
R-382	40	48	38	32	36	34	35	12	0	40	782,401	4,489,116	159	1.5
R-383	40	48	37	32	35	33	35	10	0	39	782,443	4,489,093	159	1.5
R-385	40	49	37	32	36	34	35	12	0	40	782,403	4,489,061	160	1.5
R-386	40	48	37	32	36	33	35	11	0	39	782,445	4,489,165	158	1.5
R-387	40	49	38	32	36	34	36	12	0	40	782,395	4,489,148	159	1.5
R-389	40	48	38	32	36	34	36	13	0	40	782,394	4,489,178	159	1.5
R-390	40	49	38	32	36	34	35	12	0	40	782,439	4,489,241	157	1.5
R-391	40	49	38	33	36	34	36	13	0	40	782,388	4,489,211	158	1.5
R-392	41	49	38	33	36	34	36	13	0	40	782,426	4,489,315	156	1.5
R-393	41	49	38	33	36	34	36	14	0	40	782,391	4,489,291	157	1.5
R-394	41	49	38	33	36	34	36	14	0	40	782,429	4,489,359	156	1.5
R-395	41	49	38	33	36	34	36	14	0	41	782,385	4,489,319	156	1.5
R-397	41	49	38	33	37	35	37	15	0	41	782,385	4,489,349	156	1.5
R-398	41	49	38	33	36	35	37	15	0	41	782,427	4,489,423	156	1.5
R-400	41	49	38	33	37	35	37	15	0	41	782,388	4,489,377	156	1.5
R-404	41	49	38	33	36	34	36	13	0	40	782,390	4,489,250	157	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-406	41	50	39	33	37	36	38	20	0	42	782,417	4,489,561	155	1.5
R-407	41	49	38	33	37	35	37	16	0	41	782,386	4,489,403	156	1.5
R-410	43	51	41	36	40	38	42	26	0	45	782,086	4,489,543	159	1.5
R-412	42	50	39	34	38	36	39	21	0	43	782,385	4,489,559	155	1.5
R-413	42	50	40	35	38	37	40	24	0	44	782,266	4,489,552	156	1.5
R-414	41	49	38	33	37	35	37	18	0	41	782,506	4,489,572	156	1.5
R-416	40	49	38	32	36	34	36	15	0	40	782,583	4,489,576	156	1.5
R-417	41	49	38	33	36	34	36	15	0	40	782,512	4,489,507	156	1.5
R-420	40	48	37	32	35	33	35	12	0	39	782,618	4,489,511	156	1.5
R-421	41	49	38	32	36	34	36	13	0	40	782,497	4,489,420	156	1.5
R-422	40	48	37	32	36	33	35	12	0	39	782,554	4,489,443	156	1.5
R-424	40	48	37	32	36	33	35	11	0	39	782,558	4,489,427	156	1.5
R-425	40	48	37	32	35	33	34	10	0	39	782,517	4,489,297	156	1.5
R-426	40	48	37	32	35	33	34	10	0	39	782,559	4,489,393	156	1.5
R-428	40	48	37	32	35	33	34	10	0	39	782,563	4,489,374	156	1.5
R-430	40	48	37	32	35	33	34	8	0	38	782,530	4,489,201	157	1.5
R-431	40	48	37	32	35	33	34	8	0	38	782,563	4,489,296	156	1.5
R-432	40	48	37	32	35	33	34	8	0	38	782,533	4,489,187	157	1.5
R-433	40	48	37	31	35	33	34	7	0	38	782,531	4,489,158	157	1.5
R-434	40	48	37	31	35	33	33	7	0	38	782,564	4,489,251	156	1.5
R-436	40	48	37	31	35	33	33	7	0	38	782,526	4,489,123	157	1.5
R-437	40	48	36	31	35	32	33	6	0	38	782,579	4,489,200	156	1.5
R-438	40	48	37	31	35	32	33	7	0	38	782,533	4,489,102	157	1.5
R-439	40	48	36	31	35	32	33	6	0	38	782,572	4,489,179	157	1.5
R-440	40	48	36	31	35	32	33	6	0	38	782,541	4,489,068	157	1.5
R-441	40	48	36	31	35	32	33	6	0	38	782,578	4,489,154	157	1.5
R-443	39	48	36	31	34	32	33	5	0	38	782,574	4,489,069	157	1.5
R-444	39	47	36	31	34	32	32	4	0	37	782,578	4,489,012	157	1.5
R-446	39	48	36	31	35	32	33	6	0	38	782,532	4,489,027	158	1.5
R-447	39	47	36	31	34	32	32	4	0	37	782,589	4,488,979	157	1.5
R-448	39	48	36	31	35	32	33	6	0	38	782,543	4,488,989	159	1.5
R-449	39	48	36	31	34	32	33	5	0	38	782,547	4,488,965	159	1.5
R-450	39	47	36	31	34	32	32	4	0	37	782,586	4,488,950	158	1.5
R-451	39	47	36	31	35	32	33	6	0	38	782,534	4,488,935	159	1.5
R-452	39	47	36	31	34	32	33	5	0	38	782,543	4,488,904	159	1.5
R-453	39	47	36	31	34	32	32	5	0	37	782,542	4,488,839	159	1.5
R-455	39	47	36	31	34	32	33	6	0	38	782,537	4,488,877	159	1.5
R-456	39	47	36	31	34	32	32	5	0	37	782,554	4,488,860	159	1.5
R-463	40	48	37	32	35	33	35	12	0	39	782,676	4,489,627	158	1.5
R-467	40	48	37	32	36	34	36	14	0	40	782,627	4,489,619	156	1.5
R-469	38	46	35	30	33	30	29	0	0	35	783,002	4,489,599	161	1.5
R-471	40	48	37	32	35	33	35	12	0	39	782,629	4,489,541	156	1.5
R-473	40	48	37	32	35	33	34	10	0	39	782,626	4,489,472	156	1.5
R-474	39	48	37	31	35	33	34	8	0	38	782,640	4,489,416	156	1.5
R-477	40	48	36	31	34	32	33	5	0	38	782,638	4,489,268	156	1.5
R-478	39	48	36	31	34	32	32	4	0	37	782,642	4,489,225	156	1.5
R-479	39	47	36	31	34	32	32	4	0	37	782,639	4,489,164	157	1.5
R-480	39	47	36	31	34	32	32	3	0	37	782,653	4,489,137	157	1.5
R-484	39	47	35	30	33	31	31	1	0	36	782,664	4,488,838	158	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-492	41	49	39	34	37	36	39	19	0	43	782,637	4,490,471	161	1.5
R-493	43	51	42	37	41	40	45	30	0	48	782,349	4,490,377	164	1.5
R-494	40	49	38	32	36	34	37	14	0	41	782,747	4,490,440	162	1.5
R-497	40	48	37	32	35	33	35	11	0	39	782,836	4,490,449	162	1.5
R-498	40	48	37	32	35	33	35	12	0	40	782,821	4,490,479	162	1.5
R-501	39	47	36	31	34	32	34	8	0	38	782,917	4,490,452	162	1.5
R-502	39	47	36	31	34	32	33	5	0	37	782,976	4,490,453	163	1.5
R-503	39	47	36	31	34	32	33	5	0	37	782,974	4,490,481	163	1.5
R-504	39	47	36	30	34	31	32	4	0	37	783,012	4,490,455	163	1.5
R-505	38	47	35	30	33	31	31	2	0	36	783,061	4,490,471	163	1.5
R-506	38	46	35	30	33	30	31	0	0	36	783,095	4,490,460	163	1.5
R-507	38	46	35	29	33	30	30	0	0	35	783,152	4,490,482	161	1.5
R-508	38	46	35	29	33	30	30	0	0	35	783,136	4,490,513	160	1.5
R-510	38	47	35	30	33	31	31	2	0	36	783,059	4,490,487	163	1.5
R-513	38	46	35	30	33	30	31	1	0	36	783,095	4,490,529	162	1.5
R-514	38	46	35	29	32	30	30	0	0	35	783,147	4,490,588	156	1.5
R-516	38	46	35	30	33	30	31	1	0	36	783,092	4,490,588	159	1.5
R-519	38	46	35	29	33	30	30	0	0	35	783,127	4,490,720	151	1.5
R-520	38	46	35	30	33	30	31	3	0	36	783,035	4,490,826	150	1.5
R-521	39	47	36	30	34	31	33	6	0	37	782,969	4,490,806	155	1.5
R-523	38	46	35	30	33	31	31	3	0	36	783,048	4,490,719	154	1.5
R-525	39	47	36	30	34	32	33	6	0	37	782,964	4,490,763	156	1.5
R-527	39	47	36	30	34	31	32	5	0	37	783,006	4,490,653	159	1.5
R-528	38	46	35	30	33	31	31	3	0	36	783,051	4,490,691	156	1.5
R-529	39	47	35	30	34	31	32	4	0	37	783,012	4,490,612	161	1.5
R-530	38	46	35	30	33	31	31	3	0	36	783,055	4,490,642	158	1.5
R-531	39	47	36	30	34	31	32	4	0	37	783,010	4,490,596	161	1.5
R-532	38	46	35	30	33	31	31	3	0	36	783,053	4,490,597	161	1.5
R-533	39	47	36	30	34	31	32	4	0	37	783,014	4,490,566	162	1.5
R-534	38	46	35	30	33	31	31	2	0	36	783,062	4,490,569	161	1.5
R-535	39	47	36	30	34	31	32	4	0	37	783,015	4,490,515	163	1.5
R-537	39	47	35	30	34	31	32	3	0	37	783,023	4,490,494	163	1.5
R-538	39	47	36	30	34	32	33	5	0	37	782,984	4,490,527	163	1.5
R-539	39	47	36	31	34	32	33	6	0	38	782,965	4,490,493	163	1.5
R-540	39	47	36	31	34	32	33	6	0	38	782,962	4,490,588	162	1.5
R-541	39	47	36	31	34	32	33	6	0	38	782,963	4,490,608	161	1.5
R-545	39	47	36	31	34	32	34	8	0	38	782,916	4,490,562	162	1.5
R-546	39	47	36	31	34	32	34	9	0	38	782,914	4,490,630	161	1.5
R-547	39	47	36	31	34	32	34	8	0	38	782,919	4,490,690	160	1.5
R-548	39	47	36	31	35	32	34	10	0	38	782,891	4,490,724	159	1.5
R-550	39	47	36	31	35	32	34	10	0	38	782,890	4,490,759	158	1.5
R-551	39	47	36	31	34	32	34	9	0	38	782,908	4,490,794	156	1.5
R-552	39	47	36	30	34	31	32	6	0	37	782,966	4,490,842	153	1.5
R-553	39	47	36	31	34	32	34	9	0	38	782,880	4,490,867	155	1.5
R-557	39	47	36	31	34	32	33	8	0	38	782,898	4,490,901	153	1.5
R-558	38	46	35	30	33	30	31	3	0	36	783,029	4,490,884	149	1.5
R-559	39	47	36	31	34	32	33	8	0	38	782,896	4,490,919	152	1.5
R-560	38	47	35	30	33	31	32	5	0	37	782,955	4,490,964	148	1.5
R-561	38	46	35	30	33	31	32	5	0	37	782,956	4,491,005	147	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-562	39	47	36	31	34	32	33	8	0	38	782,892	4,490,936	151	1.5
R-566	38	46	35	30	33	30	31	4	0	36	782,941	4,491,105	147	1.5
R-567	38	47	35	30	34	31	32	6	0	37	782,887	4,491,088	149	1.5
R-569	39	47	36	30	34	31	32	6	0	37	782,894	4,491,046	148	1.5
R-571	39	47	36	30	34	31	33	7	0	37	782,896	4,491,026	148	1.5
R-572	39	47	36	30	34	32	33	7	0	37	782,902	4,490,961	150	1.5
R-573	39	47	36	30	34	31	33	7	0	37	782,900	4,490,997	149	1.5
R-574	39	47	36	31	34	32	33	8	0	38	782,883	4,490,977	150	1.5
R-578	38	47	35	30	33	31	32	6	0	37	782,883	4,491,109	149	1.5
R-579	38	46	35	30	33	31	32	5	0	37	782,883	4,491,158	149	1.5
R-580	38	46	35	30	33	31	32	5	0	37	782,890	4,491,142	148	1.5
R-581	38	46	35	30	33	30	31	4	0	36	782,890	4,491,208	148	1.5
R-583	39	47	36	30	34	32	33	8	0	37	782,782	4,491,203	149	1.5
R-584	39	47	35	30	34	31	33	7	0	37	782,819	4,491,194	149	1.5
R-586	39	47	36	31	34	32	34	9	0	38	782,770	4,491,169	150	1.5
R-587	39	47	36	31	34	32	34	9	0	38	782,786	4,491,153	150	1.5
R-588	39	47	36	31	34	32	34	10	0	38	782,779	4,491,134	150	1.5
R-590	39	48	37	31	35	33	35	12	0	39	782,733	4,491,087	153	1.5
R-591	39	47	36	31	34	32	34	11	0	39	782,774	4,491,088	153	1.5
R-593	39	47	37	31	35	33	35	11	0	39	782,774	4,491,063	154	1.5
R-594	39	47	37	31	35	33	35	12	0	39	782,779	4,491,045	155	1.5
R-595	40	48	37	32	36	34	36	15	0	40	782,711	4,491,003	158	1.5
R-596	40	48	37	32	35	34	36	15	0	40	782,730	4,490,990	158	1.5
R-597	39	48	37	31	35	33	35	12	0	39	782,778	4,491,006	156	1.5
R-599	40	48	38	32	36	34	37	15	0	40	782,718	4,490,974	159	1.5
R-600	40	48	38	32	36	34	37	15	0	40	782,723	4,490,952	160	1.5
R-601	40	48	38	32	36	34	37	16	0	40	782,725	4,490,931	160	1.5
R-602	39	48	37	31	35	33	35	12	0	39	782,802	4,490,907	156	1.5
R-603	40	48	38	32	36	34	37	16	0	40	782,733	4,490,910	160	1.5
R-604	40	48	37	32	35	33	36	13	0	40	782,791	4,490,878	157	1.5
R-605	40	48	38	32	36	34	37	16	0	40	782,735	4,490,884	159	1.5
R-606	40	48	37	32	35	33	36	14	0	40	782,789	4,490,840	158	1.5
R-607	40	48	38	32	36	34	37	17	0	41	782,720	4,490,842	160	1.5
R-608	40	48	37	32	35	33	36	14	0	40	782,795	4,490,818	159	1.5
R-609	40	48	38	32	36	34	37	16	0	41	782,737	4,490,825	160	1.5
R-610	40	48	38	32	36	34	37	16	0	41	782,747	4,490,749	160	1.5
R-611	40	48	37	32	35	34	36	14	0	40	782,793	4,490,800	159	1.5
R-612	40	48	38	32	36	34	37	16	0	41	782,748	4,490,719	160	1.5
R-613	40	48	37	32	35	34	36	14	0	40	782,797	4,490,768	159	1.5
R-614	40	48	38	32	36	34	37	16	0	41	782,751	4,490,699	160	1.5
R-616	40	48	38	32	36	34	37	16	0	41	782,750	4,490,684	161	1.5
R-617	40	49	38	32	36	34	37	16	0	41	782,746	4,490,658	161	1.5
R-619	40	49	38	32	36	34	37	15	0	41	782,755	4,490,624	161	1.5
R-620	40	48	37	32	36	34	36	14	0	40	782,798	4,490,660	161	1.5
R-621	40	49	38	32	36	34	37	15	0	41	782,756	4,490,606	161	1.5
R-622	40	49	38	32	36	34	37	15	0	41	782,753	4,490,585	161	1.5
R-623	40	48	38	32	36	34	37	15	0	41	782,762	4,490,553	161	1.5
R-624	40	48	37	32	36	34	36	14	0	40	782,800	4,490,645	162	1.5
R-627	40	48	37	32	36	34	36	13	0	40	782,801	4,490,609	162	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-628	40	49	39	33	37	35	38	18	0	42	782,702	4,490,742	161	1.5
R-629	40	48	37	32	35	33	36	12	0	40	782,821	4,490,573	162	1.5
R-630	40	48	37	32	35	33	36	12	0	40	782,815	4,490,477	162	1.5
R-631	40	49	38	32	36	34	37	15	0	41	782,757	4,490,516	161	1.5
R-632	40	49	38	32	36	34	37	15	0	41	782,756	4,490,492	161	1.5
R-634	41	49	39	34	37	36	40	21	0	43	782,634	4,490,803	164	1.5
R-635	41	49	39	34	38	36	39	20	0	43	782,636	4,490,503	161	1.5
R-637	41	49	39	34	37	36	39	20	0	43	782,640	4,490,532	161	1.5
R-638	41	50	40	34	38	36	40	21	0	43	782,634	4,490,595	161	1.5
R-639	40	49	39	33	37	35	38	18	0	42	782,697	4,490,744	161	1.5
R-640	41	49	40	34	38	36	40	21	0	43	782,631	4,490,671	162	1.5
R-641	41	49	39	34	38	36	40	22	0	43	782,630	4,490,739	163	1.5
R-642	41	49	40	34	38	36	40	22	0	43	782,627	4,490,708	162	1.5
R-643	41	50	40	34	38	36	40	20	0	43	782,635	4,490,559	161	1.5
R-650	41	49	39	33	37	36	40	21	0	43	782,638	4,490,794	164	1.5
R-652	41	49	39	33	37	36	39	20	0	42	782,629	4,490,897	163	1.5
R-654	40	49	39	33	37	35	39	20	0	42	782,613	4,490,977	160	1.5
R-655	40	49	39	33	37	35	38	19	0	42	782,610	4,491,010	159	1.5
R-656	40	48	38	32	36	34	37	17	0	41	782,543	4,491,181	157	1.5
R-657	40	49	38	33	36	35	38	19	0	42	782,607	4,491,045	159	1.5
R-659	40	48	38	32	36	34	37	16	0	40	782,602	4,491,158	156	1.5
R-667	38	46	34	29	32	29	29	0	0	35	782,513	4,491,700	145	1.5
R-668	38	46	35	29	32	30	30	0	0	35	782,482	4,491,656	145	1.5
R-672	38	46	34	29	32	29	29	0	0	35	782,574	4,491,657	146	1.5
R-676	38	46	35	29	33	30	30	1	0	35	782,444	4,491,653	147	1.5
R-677	38	46	35	30	33	30	31	2	0	36	782,407	4,491,647	149	1.5
R-678	38	46	35	30	33	31	31	4	0	36	782,407	4,491,595	150	1.5
R-679	38	46	35	30	33	30	31	2	0	36	782,372	4,491,647	150	1.5
R-680	38	46	35	30	33	31	32	4	0	37	782,375	4,491,597	152	1.5
R-681	39	47	36	30	33	31	32	5	0	37	782,350	4,491,586	152	1.5
R-682	38	46	35	30	33	31	31	3	0	36	782,333	4,491,638	151	1.5
R-683	38	46	35	30	33	31	31	4	0	36	782,311	4,491,626	152	1.5
R-685	39	47	36	31	34	32	33	7	0	37	782,303	4,491,556	154	1.5
R-686	39	47	36	30	34	31	32	5	0	37	782,270	4,491,597	153	1.5
R-687	39	47	36	30	34	31	32	5	0	37	782,255	4,491,610	154	1.5
R-688	39	47	35	30	33	31	32	4	0	37	782,232	4,491,640	155	1.5
R-689	39	47	36	30	34	31	32	5	0	37	782,185	4,491,625	156	1.5
R-690	39	47	36	31	34	32	33	6	0	37	782,177	4,491,590	156	1.5
R-691	39	47	36	31	34	32	33	7	0	38	782,244	4,491,555	155	1.5
R-692	39	47	36	31	34	32	33	7	0	38	782,217	4,491,572	156	1.5
R-693	39	47	36	31	34	32	33	8	0	38	782,289	4,491,527	154	1.5
R-694	39	47	37	31	35	32	34	9	0	38	782,212	4,491,514	156	1.5
R-695	39	47	37	31	35	32	34	10	0	38	782,264	4,491,495	155	1.5
R-697	40	48	37	32	35	33	35	11	0	39	782,182	4,491,471	158	1.5
R-698	40	48	38	32	36	34	36	14	0	40	782,178	4,491,412	157	1.5
R-699	40	48	37	32	35	33	35	12	0	39	782,233	4,491,447	156	1.5
R-700	40	48	38	32	36	34	36	14	0	40	782,256	4,491,392	156	1.5
R-701	39	48	37	31	35	33	35	11	0	39	782,302	4,491,447	155	1.5
R-702	40	48	37	32	35	33	36	14	0	40	782,303	4,491,391	156	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix B - Receptor Locations and Daytime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-703	39	47	36	31	35	32	34	10	0	38	782,378	4,491,454	153	1.5

Notes: PL = Property Line
R = Noise Sensitive Receptor
* = Class B Land Use

Appendix C Receptor Locations and Nighttime Operational Noise Modeling Results



Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-062*	23	29	22	15	15	5	0	0	0	14	771,494	4,485,671	157	1.5
R-260*	25	30	24	17	17	9	0	0	0	17	780,416	4,487,838	156	1.5
R-767*	28	34	28	21	22	15	0	0	0	22	779,404	4,489,825	158	1.5
R-778*	27	33	27	20	21	13	0	0	0	20	779,300	4,491,444	143	1.5
R-064*	24	30	23	16	16	7	0	0	0	16	771,869	4,485,853	155	1.5
R-067*	24	30	23	16	16	7	0	0	0	16	771,867	4,485,716	156	1.5
R-068*	26	32	26	19	20	12	0	0	0	19	772,594	4,485,806	153	1.5
R-075*	28	33	27	20	22	15	0	0	0	21	773,060	4,485,911	156	1.5
R-314*	24	30	23	16	16	7	0	0	0	16	782,669	4,488,033	162	1.5
R-325*	26	32	25	18	19	11	0	0	0	18	783,222	4,491,526	152	1.5
R-344*	26	31	25	18	19	11	0	0	0	18	782,659	4,488,637	159	1.5
R-459*	27	33	26	19	20	13	0	0	0	20	782,651	4,489,060	157	1.5
R-460*	28	34	27	21	22	15	0	0	0	21	782,616	4,489,353	156	1.5
R-461*	28	34	27	21	22	15	0	0	0	21	782,746	4,489,549	157	1.5
R-653*	29	35	29	22	23	17	2	0	0	23	782,610	4,491,106	157	1.5
R-662*	26	32	26	19	20	12	0	0	0	19	782,679	4,491,977	147	1.5
R-663*	27	32	26	19	20	12	0	0	0	19	782,714	4,491,924	146	1.5
R-664*	27	32	26	19	20	13	0	0	0	20	782,699	4,491,891	145	1.5
R-665*	27	32	26	19	20	12	0	0	0	20	782,827	4,491,766	147	1.5
R-666*	26	32	26	19	20	12	0	0	0	19	782,805	4,491,871	147	1.5
R-722*	27	33	27	20	21	14	0	0	0	21	782,754	4,491,498	146	1.5
R-741*	28	34	28	21	22	15	0	0	0	22	782,585	4,491,487	146	1.5
R-777*	24	30	24	16	17	8	0	0	0	16	778,874	4,492,154	143	1.5
R-780*	28	33	27	20	22	15	0	0	0	21	779,786	4,491,851	142	1.5
R-781*	27	33	27	20	21	14	0	0	0	21	779,883	4,492,017	141	1.5
R-782*	28	34	27	21	22	15	0	0	0	22	780,029	4,491,969	147	1.5
R-783*	28	34	28	21	22	15	0	0	0	22	779,946	4,491,877	146	1.5
R-784*	29	35	29	22	23	17	3	0	0	23	780,059	4,491,711	146	1.5
R-785*	26	32	26	19	19	11	0	0	0	19	780,335	4,492,609	142	1.5
R-792*	30	36	30	23	25	19	5	0	0	25	779,815	4,491,123	149	1.5
R-811*	24	30	23	16	16	7	0	0	0	15	778,692	4,492,198	143	1.5
R-812*	24	30	24	16	17	8	0	0	0	16	778,944	4,492,242	142	1.5
R-088*	32	38	32	26	28	22	11	0	0	28	774,600	4,485,853	151	1.5
R-231*	24	30	24	16	17	8	0	0	0	16	780,185	4,487,819	158	1.5
R-731*	28	34	27	21	22	15	0	0	0	21	782,711	4,491,430	146	1.5
R-786*	25	31	24	17	17	9	0	0	0	17	780,679	4,493,103	142	1.5
PL-1	31	37	31	24	26	20	8	0	0	26	782,012	4,489,566	158	1.5
PL-2	34	41	36	29	31	26	16	0	0	31	780,308	4,490,660	161	1.5
PL-3	37	43	38	31	34	29	20	1	0	34	773,974	4,484,559	157	1.5
PL-4	28	33	27	20	21	14	0	0	0	21	772,922	4,483,756	155	1.5
PL-5	25	31	24	17	18	9	0	0	0	17	772,165	4,485,699	152	1.5
R-061	23	29	22	14	14	5	0	0	0	14	771,477	4,485,723	158	1.5
R-458	26	32	26	19	20	12	0	0	0	19	782,650	4,488,871	158	1.5
R-592	29	34	28	21	23	16	1	0	0	22	782,720	4,491,026	157	1.5
R-002	26	32	25	18	19	11	0	0	0	18	773,510	4,482,605	167	1.5
R-004	26	32	25	18	19	11	0	0	0	19	773,649	4,482,590	166	1.5
R-005	29	35	29	22	23	17	2	0	0	23	774,111	4,483,162	158	1.5
R-007	27	33	26	19	20	13	0	0	0	20	774,102	4,482,655	157	1.5
R-008	28	33	27	20	21	14	0	0	0	21	774,105	4,482,871	163	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-009	25	31	24	17	18	10	0	0	0	17	773,308	4,482,512	161	1.5
R-010	25	31	24	17	17	9	0	0	0	17	773,173	4,482,465	159	1.5
R-011	25	31	24	17	17	9	0	0	0	17	773,195	4,482,471	160	1.5
R-012	25	31	25	17	18	10	0	0	0	18	773,139	4,482,682	154	1.5
R-013	25	31	24	17	17	9	0	0	0	17	773,002	4,482,629	154	1.5
R-014	24	30	24	16	17	8	0	0	0	16	772,880	4,482,518	158	1.5
R-015	24	30	23	16	16	8	0	0	0	16	772,867	4,482,455	159	1.5
R-016	24	30	23	16	16	7	0	0	0	15	772,944	4,482,256	153	1.5
R-017	23	29	22	15	15	6	0	0	0	15	772,917	4,482,102	153	1.5
R-018	24	29	23	15	15	6	0	0	0	15	772,978	4,482,095	153	1.5
R-019	23	29	22	15	15	5	0	0	0	14	772,916	4,481,994	152	1.5
R-020	23	29	22	15	15	6	0	0	0	15	772,944	4,482,022	152	1.5
R-021	24	29	23	15	16	7	0	0	0	15	773,148	4,482,085	155	1.5
R-022	24	29	23	15	15	6	0	0	0	15	773,055	4,482,102	153	1.5
R-023	24	30	23	16	16	8	0	0	0	16	773,088	4,482,318	163	1.5
R-024	24	30	23	16	16	7	0	0	0	15	773,025	4,482,224	155	1.5
R-025	24	30	23	16	16	7	0	0	0	16	773,141	4,482,213	161	1.5
R-026	24	30	23	16	16	8	0	0	0	16	773,213	4,482,261	163	1.5
R-027	24	30	23	16	16	7	0	0	0	16	773,333	4,482,127	167	1.5
R-028	24	30	23	16	16	7	0	0	0	16	773,257	4,482,141	165	1.5
R-029	24	30	24	16	17	8	0	0	0	16	773,530	4,482,137	158	1.5
R-030	24	30	24	16	17	8	0	0	0	16	773,443	4,482,188	160	1.5
R-031	24	30	24	16	17	8	0	0	0	16	773,580	4,482,155	159	1.5
R-032	25	30	24	16	17	8	0	0	0	17	773,497	4,482,225	158	1.5
R-033	25	30	24	16	17	8	0	0	0	17	773,640	4,482,172	159	1.5
R-034	25	30	24	17	17	9	0	0	0	17	773,539	4,482,229	158	1.5
R-035	25	31	24	17	17	9	0	0	0	17	773,659	4,482,256	158	1.5
R-036	25	31	24	17	18	9	0	0	0	17	773,570	4,482,328	161	1.5
R-037	25	31	24	17	18	9	0	0	0	17	773,569	4,482,329	161	1.5
R-038	25	30	24	17	17	9	0	0	0	17	773,536	4,482,231	158	1.5
R-039	24	30	23	16	16	7	0	0	0	16	773,416	4,482,054	165	1.5
R-040	24	29	23	15	15	6	0	0	0	15	773,494	4,481,909	160	1.5
R-041	24	29	23	15	15	7	0	0	0	15	773,547	4,481,901	161	1.5
R-042	24	29	23	15	15	6	0	0	0	15	773,358	4,481,900	160	1.5
R-043	24	30	23	16	16	7	0	0	0	16	773,642	4,481,959	156	1.5
R-044	24	30	23	15	16	7	0	0	0	15	773,422	4,481,984	162	1.5
R-046	25	31	24	17	18	9	0	0	0	17	772,925	4,482,715	157	1.5
R-047	27	33	27	20	21	14	0	0	0	21	772,681	4,484,123	160	1.5
R-048	27	33	27	20	21	14	0	0	0	20	772,810	4,483,738	158	1.5
R-049	26	32	26	19	20	12	0	0	0	19	772,960	4,483,241	163	1.5
R-050	25	31	25	18	18	10	0	0	0	18	772,892	4,482,914	166	1.5
R-051	25	31	25	18	18	10	0	0	0	18	772,946	4,482,844	165	1.5
R-052	25	31	24	17	18	10	0	0	0	18	772,124	4,484,065	159	1.5
R-053	25	30	24	17	17	8	0	0	0	17	771,930	4,484,075	155	1.5
R-054	24	29	23	15	15	6	0	0	0	15	771,584	4,484,168	154	1.5
R-055	23	29	22	14	14	5	0	0	0	14	771,300	4,484,137	156	1.5
R-056	24	29	23	15	15	6	0	0	0	15	771,517	4,484,406	157	1.5
R-057	24	30	23	16	16	7	0	0	0	15	771,621	4,484,711	154	1.5
R-060	23	29	22	15	15	6	0	0	0	15	771,497	4,485,331	157	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-063	23	29	22	14	14	5	0	0	0	14	771,427	4,485,723	158	1.5
R-066	25	31	24	17	17	9	0	0	0	17	772,131	4,485,769	156	1.5
R-069	26	32	26	19	19	12	0	0	0	19	772,592	4,485,870	154	1.5
R-070	26	32	25	18	19	11	0	0	0	19	772,638	4,486,023	153	1.5
R-072	27	32	26	19	20	13	0	0	0	20	772,752	4,485,885	154	1.5
R-073	27	33	26	20	21	13	0	0	0	20	772,858	4,485,884	155	1.5
R-074	27	33	27	20	21	14	0	0	0	21	772,949	4,485,888	156	1.5
R-076	28	34	28	21	23	16	1	0	0	22	773,206	4,485,828	157	1.5
R-077	29	34	28	22	23	16	1	0	0	23	773,257	4,485,833	157	1.5
R-078	29	35	28	22	23	17	2	0	0	23	773,313	4,485,845	157	1.5
R-080	32	37	32	25	27	21	9	0	0	27	774,210	4,485,882	152	1.5
R-085	31	37	30	24	26	20	7	0	0	25	774,850	4,486,050	153	1.5
R-086	32	38	32	26	28	22	10	0	0	27	774,560	4,485,867	151	1.5
R-089	30	36	29	23	24	18	4	0	0	24	774,921	4,486,208	150	1.5
R-090	29	35	29	22	24	17	3	0	0	23	775,028	4,486,282	151	1.5
R-094	26	32	25	18	19	11	0	0	0	18	772,639	4,486,103	154	1.5
R-096	25	31	25	18	18	10	0	0	0	18	772,583	4,486,212	154	1.5
R-097	31	37	31	24	26	20	8	0	0	26	775,079	4,485,934	142	1.5
R-101	34	40	35	28	31	25	16	0	0	31	775,144	4,485,357	143	1.5
R-107	33	39	34	27	29	24	14	0	0	29	775,326	4,484,173	150	1.5
R-110	32	38	32	26	28	22	11	0	0	28	775,502	4,484,150	149	1.5
R-111	32	38	32	26	28	22	10	0	0	27	775,456	4,484,037	150	1.5
R-113	32	38	33	26	28	22	11	0	0	28	775,424	4,484,081	150	1.5
R-114	32	38	33	26	28	22	11	0	0	28	775,449	4,484,124	150	1.5
R-117	34	41	38	31	33	29	20	1	0	34	775,066	4,484,367	156	1.5
R-119	37	43	40	33	35	30	23	6	0	35	774,449	4,484,228	157	1.5
R-120	37	43	39	32	34	29	21	2	0	34	774,365	4,484,176	159	1.5
R-125	37	43	38	31	33	29	20	1	0	34	773,970	4,484,537	157	1.5
R-127	35	41	35	29	31	26	16	0	0	31	773,863	4,484,310	158	1.5
R-132	30	35	29	23	24	18	4	0	0	24	773,118	4,484,255	154	1.5
R-134	29	35	29	22	23	17	2	0	0	23	773,020	4,484,155	151	1.5
R-135	29	35	29	22	23	17	2	0	0	23	772,983	4,484,307	153	1.5
R-139	28	34	27	21	22	15	0	0	0	22	772,795	4,484,226	159	1.5
R-145	30	35	29	23	24	18	4	0	0	24	773,049	4,484,684	157	1.5
R-148	27	33	27	20	21	14	0	0	0	20	772,555	4,484,972	157	1.5
R-150	27	32	26	19	20	12	0	0	0	19	772,593	4,485,664	156	1.5
R-153	26	32	25	18	19	11	0	0	0	19	776,896	4,484,744	144	1.5
R-156	27	33	26	19	20	13	0	0	0	20	776,210	4,486,047	142	1.5
R-159	23	29	22	14	13	1	0	0	0	13	778,275	4,486,793	154	1.5
R-161	23	29	22	14	13	1	0	0	0	13	778,238	4,486,838	153	1.5
R-163	23	29	22	14	13	1	0	0	0	13	778,381	4,487,072	156	1.5
R-164	23	29	22	14	13	1	0	0	0	13	778,389	4,487,024	157	1.5
R-169	24	29	22	14	13	2	0	0	0	13	778,466	4,487,273	156	1.5
R-171	24	29	22	14	13	1	0	0	0	13	778,387	4,487,277	155	1.5
R-175	24	29	22	14	13	2	0	0	0	13	778,441	4,487,430	149	1.5
R-176	24	29	22	14	13	2	0	0	0	13	778,468	4,487,466	152	1.5
R-177	24	29	22	14	13	2	0	0	0	13	778,551	4,487,426	157	1.5
R-180	24	29	22	14	13	2	0	0	0	13	778,501	4,487,559	154	1.5
R-183	24	29	22	14	13	3	0	0	0	13	778,510	4,487,702	155	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-184	24	29	22	14	13	3	0	0	0	14	778,626	4,487,641	158	1.5
R-186	22	28	21	13	13	3	0	0	0	13	778,562	4,487,953	156	1.5
R-192	23	29	22	14	14	5	0	0	0	14	778,750	4,488,227	156	1.5
R-195	24	30	23	16	16	7	0	0	0	16	779,955	4,487,782	159	1.5
R-197	24	30	23	16	16	8	0	0	0	16	780,079	4,487,794	159	1.5
R-198	24	30	23	15	16	7	0	0	0	15	779,962	4,487,681	160	1.5
R-205	24	29	23	15	15	6	0	0	0	15	779,966	4,487,583	160	1.5
R-207	24	29	23	15	15	6	0	0	0	15	780,058	4,487,591	159	1.5
R-209	23	29	22	15	15	6	0	0	0	15	780,048	4,487,479	160	1.5
R-211	23	29	22	15	15	5	0	0	0	14	779,966	4,487,480	160	1.5
R-216	23	29	22	14	14	5	0	0	0	14	780,045	4,487,368	160	1.5
R-218	23	28	22	14	14	4	0	0	0	14	779,974	4,487,292	159	1.5
R-219	23	29	22	14	14	4	0	0	0	14	780,051	4,487,285	160	1.5
R-223	23	28	21	14	13	4	0	0	0	13	779,986	4,487,178	159	1.5
R-224	23	28	22	14	14	4	0	0	0	13	780,073	4,487,188	159	1.5
R-226	22	28	21	13	13	3	0	0	0	13	780,062	4,487,096	159	1.5
R-228	22	28	21	13	13	3	0	0	0	13	779,986	4,487,106	158	1.5
R-234	25	30	24	17	17	9	0	0	0	17	780,262	4,487,875	157	1.5
R-235	24	30	23	16	16	8	0	0	0	16	780,282	4,487,729	159	1.5
R-239	24	30	23	16	16	7	0	0	0	16	780,285	4,487,663	159	1.5
R-243	24	30	23	16	16	7	0	0	0	16	780,344	4,487,653	158	1.5
R-244	24	29	23	15	15	6	0	0	0	15	780,284	4,487,489	159	1.5
R-248	24	30	23	16	16	7	0	0	0	16	780,381	4,487,616	158	1.5
R-250	23	29	22	15	15	6	0	0	0	14	780,284	4,487,393	159	1.5
R-253	23	29	22	14	14	5	0	0	0	14	780,294	4,487,300	157	1.5
R-254	23	29	22	14	14	5	0	0	0	14	780,252	4,487,270	158	1.5
R-255	23	28	22	14	14	4	0	0	0	14	780,299	4,487,195	157	1.5
R-257	23	28	21	14	14	4	0	0	0	13	780,308	4,487,104	157	1.5
R-261	25	31	24	17	17	9	0	0	0	17	780,772	4,487,852	165	1.5
R-269	25	31	24	17	18	9	0	0	0	17	781,163	4,487,873	165	1.5
R-271	24	30	24	16	17	8	0	0	0	16	781,237	4,487,691	162	1.5
R-272	25	31	24	17	18	9	0	0	0	17	781,270	4,487,869	163	1.5
R-275	25	31	24	17	18	9	0	0	0	17	781,380	4,487,873	160	1.5
R-278	25	31	24	17	18	9	0	0	0	17	781,454	4,487,873	160	1.5
R-279	25	31	24	17	17	9	0	0	0	17	781,476	4,487,846	160	1.5
R-280	25	31	24	17	17	9	0	0	0	17	781,475	4,487,872	159	1.5
R-282	25	31	24	17	18	9	0	0	0	17	781,574	4,487,896	159	1.5
R-286	25	31	24	17	17	9	0	0	0	17	781,670	4,487,911	162	1.5
R-287	25	30	24	17	17	8	0	0	0	17	782,034	4,487,905	162	1.5
R-290	25	30	24	16	17	8	0	0	0	16	782,161	4,487,930	162	1.5
R-294	24	30	24	16	17	8	0	0	0	16	782,211	4,487,921	162	1.5
R-296	25	30	24	16	17	8	0	0	0	16	782,355	4,488,008	161	1.5
R-299	24	30	24	16	17	8	0	0	0	16	782,413	4,488,017	161	1.5
R-300	24	30	24	16	17	8	0	0	0	16	782,442	4,488,005	161	1.5
R-301	24	30	24	16	17	8	0	0	0	16	782,395	4,488,006	161	1.5
R-303	24	30	24	16	17	8	0	0	0	16	782,375	4,488,003	161	1.5
R-304	25	30	24	16	17	8	0	0	0	16	782,344	4,488,003	161	1.5
R-306	24	30	23	16	16	8	0	0	0	16	782,469	4,488,008	161	1.5
R-307	24	30	23	16	16	8	0	0	0	16	782,502	4,488,013	161	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-309	24	30	23	16	16	8	0	0	0	16	782,533	4,488,015	162	1.5
R-311	24	30	23	16	16	8	0	0	0	16	782,564	4,488,016	162	1.5
R-312	24	30	23	16	16	8	0	0	0	16	782,593	4,488,026	162	1.5
R-326	25	30	24	17	17	9	0	0	0	17	782,427	4,488,102	163	1.5
R-328	24	30	23	16	16	8	0	0	0	16	782,699	4,488,113	162	1.5
R-329	24	30	24	16	17	8	0	0	0	16	782,662	4,488,166	162	1.5
R-331	26	32	25	18	19	12	0	0	0	19	782,670	4,488,814	158	1.5
R-333	26	32	26	19	20	12	0	0	0	19	782,603	4,488,822	159	1.5
R-334	25	30	24	16	17	8	0	0	0	16	782,685	4,488,231	158	1.5
R-337	26	32	26	19	20	12	0	0	0	19	782,549	4,488,809	159	1.5
R-339	25	31	24	17	18	9	0	0	0	17	782,632	4,488,395	157	1.5
R-341	25	31	24	17	18	10	0	0	0	18	782,670	4,488,475	157	1.5
R-345	26	32	25	18	19	11	0	0	0	19	782,657	4,488,774	159	1.5
R-351	26	32	25	18	19	11	0	0	0	19	782,661	4,488,707	160	1.5
R-353	27	32	26	19	20	13	0	0	0	20	782,495	4,488,824	159	1.5
R-355	27	33	26	19	20	13	0	0	0	20	782,460	4,488,837	158	1.5
R-356	27	33	26	19	20	13	0	0	0	20	782,453	4,488,865	158	1.5
R-357	27	33	26	19	20	13	0	0	0	20	782,414	4,488,843	158	1.5
R-358	27	33	26	20	21	13	0	0	0	20	782,447	4,488,910	158	1.5
R-360	27	33	26	20	21	13	0	0	0	20	782,471	4,488,936	160	1.5
R-361	27	33	26	20	21	13	0	0	0	20	782,416	4,488,876	158	1.5
R-363	27	33	27	20	21	13	0	0	0	20	782,410	4,488,906	158	1.5
R-366	27	33	27	20	21	14	0	0	0	21	782,409	4,488,941	158	1.5
R-367	27	33	27	20	21	14	0	0	0	21	782,454	4,488,998	160	1.5
R-370	27	33	27	20	21	14	0	0	0	21	782,411	4,488,968	159	1.5
R-371	27	33	27	20	21	14	0	0	0	21	782,452	4,489,024	160	1.5
R-372	27	33	27	20	21	14	0	0	0	21	782,444	4,489,039	160	1.5
R-374	27	33	27	20	21	14	0	0	0	21	782,400	4,488,990	159	1.5
R-375	28	33	27	20	21	14	0	0	0	21	782,403	4,489,033	159	1.5
R-378	28	33	27	20	22	14	0	0	0	21	782,398	4,489,058	160	1.5
R-379	27	33	27	20	21	14	0	0	0	21	782,444	4,489,059	160	1.5
R-380	28	33	27	20	21	14	0	0	0	21	782,438	4,489,077	160	1.5
R-381	28	34	27	20	22	15	0	0	0	21	782,445	4,489,117	158	1.5
R-382	28	34	27	21	22	15	0	0	0	21	782,401	4,489,116	159	1.5
R-383	28	33	27	20	21	14	0	0	0	21	782,443	4,489,093	159	1.5
R-385	28	33	27	20	21	14	0	0	0	21	782,403	4,489,061	160	1.5
R-386	28	34	27	21	22	15	0	0	0	21	782,445	4,489,165	158	1.5
R-387	28	34	27	21	22	15	0	0	0	22	782,395	4,489,148	159	1.5
R-389	28	34	28	21	22	15	0	0	0	22	782,394	4,489,178	159	1.5
R-390	28	34	28	21	22	15	0	0	0	22	782,439	4,489,241	157	1.5
R-391	28	34	28	21	22	15	0	0	0	22	782,388	4,489,211	158	1.5
R-392	28	34	28	21	23	16	1	0	0	22	782,426	4,489,315	156	1.5
R-393	28	34	28	21	23	16	1	0	0	22	782,391	4,489,291	157	1.5
R-394	28	34	28	21	23	16	1	0	0	22	782,429	4,489,359	156	1.5
R-395	29	34	28	21	23	16	1	0	0	22	782,385	4,489,319	156	1.5
R-397	29	34	28	22	23	16	1	0	0	23	782,385	4,489,349	156	1.5
R-398	29	35	28	22	23	16	2	0	0	23	782,427	4,489,423	156	1.5
R-400	29	35	28	22	23	16	2	0	0	23	782,388	4,489,377	156	1.5
R-404	28	34	28	21	22	16	0	0	0	22	782,390	4,489,250	157	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-406	29	35	29	22	24	17	3	0	0	23	782,417	4,489,561	155	1.5
R-407	29	35	28	22	23	17	2	0	0	23	782,386	4,489,403	156	1.5
R-410	31	36	30	24	26	20	7	0	0	25	782,086	4,489,543	159	1.5
R-412	29	35	29	22	24	17	3	0	0	24	782,385	4,489,559	155	1.5
R-413	30	36	30	23	25	18	5	0	0	24	782,266	4,489,552	156	1.5
R-414	29	35	28	22	23	17	2	0	0	23	782,506	4,489,572	156	1.5
R-416	28	34	28	21	23	16	1	0	0	22	782,583	4,489,576	156	1.5
R-417	29	34	28	22	23	16	1	0	0	23	782,512	4,489,507	156	1.5
R-420	28	34	28	21	22	15	0	0	0	22	782,618	4,489,511	156	1.5
R-421	28	34	28	21	23	16	1	0	0	22	782,497	4,489,420	156	1.5
R-422	28	34	28	21	22	16	0	0	0	22	782,554	4,489,443	156	1.5
R-424	28	34	28	21	22	15	0	0	0	22	782,558	4,489,427	156	1.5
R-425	28	34	28	21	22	15	0	0	0	22	782,517	4,489,297	156	1.5
R-426	28	34	28	21	22	15	0	0	0	22	782,559	4,489,393	156	1.5
R-428	28	34	28	21	22	15	0	0	0	22	782,563	4,489,374	156	1.5
R-430	28	33	27	20	22	14	0	0	0	21	782,530	4,489,201	157	1.5
R-431	28	34	27	21	22	15	0	0	0	21	782,563	4,489,296	156	1.5
R-432	28	33	27	20	21	14	0	0	0	21	782,533	4,489,187	157	1.5
R-433	28	33	27	20	21	14	0	0	0	21	782,531	4,489,158	157	1.5
R-434	28	34	27	20	22	15	0	0	0	21	782,564	4,489,251	156	1.5
R-436	27	33	27	20	21	14	0	0	0	21	782,526	4,489,123	157	1.5
R-437	27	33	27	20	21	14	0	0	0	21	782,579	4,489,200	156	1.5
R-438	27	33	27	20	21	14	0	0	0	21	782,533	4,489,102	157	1.5
R-439	27	33	27	20	21	14	0	0	0	21	782,572	4,489,179	157	1.5
R-440	27	33	27	20	21	14	0	0	0	21	782,541	4,489,068	157	1.5
R-441	27	33	27	20	21	14	0	0	0	21	782,578	4,489,154	157	1.5
R-443	27	33	27	20	21	14	0	0	0	20	782,574	4,489,069	157	1.5
R-444	27	33	26	20	21	13	0	0	0	20	782,578	4,489,012	157	1.5
R-446	27	33	27	20	21	14	0	0	0	20	782,532	4,489,027	158	1.5
R-447	27	33	26	19	20	13	0	0	0	20	782,589	4,488,979	157	1.5
R-448	27	33	26	20	21	13	0	0	0	20	782,543	4,488,989	159	1.5
R-449	27	33	26	19	20	13	0	0	0	20	782,547	4,488,965	159	1.5
R-450	27	33	26	19	20	13	0	0	0	20	782,586	4,488,950	158	1.5
R-451	27	33	26	19	20	13	0	0	0	20	782,534	4,488,935	159	1.5
R-452	27	33	26	19	20	13	0	0	0	20	782,543	4,488,904	159	1.5
R-453	27	32	26	19	20	12	0	0	0	20	782,542	4,488,839	159	1.5
R-455	27	32	26	19	20	13	0	0	0	20	782,537	4,488,877	159	1.5
R-456	27	32	26	19	20	12	0	0	0	20	782,554	4,488,860	159	1.5
R-463	28	34	28	21	22	16	0	0	0	22	782,676	4,489,627	158	1.5
R-467	28	34	28	21	23	16	1	0	0	22	782,627	4,489,619	156	1.5
R-469	27	33	26	19	20	13	0	0	0	20	783,002	4,489,599	161	1.5
R-471	28	34	28	21	22	16	0	0	0	22	782,629	4,489,541	156	1.5
R-473	28	34	28	21	22	15	0	0	0	22	782,626	4,489,472	156	1.5
R-474	27	33	27	21	22	15	0	0	0	21	782,640	4,489,416	156	1.5
R-477	27	33	27	20	21	14	0	0	0	21	782,638	4,489,268	156	1.5
R-478	27	33	27	20	21	14	0	0	0	21	782,642	4,489,225	156	1.5
R-479	27	33	27	20	21	14	0	0	0	20	782,639	4,489,164	157	1.5
R-480	27	33	27	20	21	13	0	0	0	20	782,653	4,489,137	157	1.5
R-484	26	32	26	19	19	12	0	0	0	19	782,664	4,488,838	158	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-492	29	35	29	23	24	18	4	0	0	24	782,637	4,490,471	161	1.5
R-493	31	37	31	25	26	20	8	0	0	26	782,349	4,490,377	164	1.5
R-494	29	35	29	22	23	17	2	0	0	23	782,747	4,490,440	162	1.5
R-497	28	34	28	21	23	16	1	0	0	22	782,836	4,490,449	162	1.5
R-498	29	34	28	21	23	16	1	0	0	22	782,821	4,490,479	162	1.5
R-501	28	34	28	21	22	15	0	0	0	22	782,917	4,490,452	162	1.5
R-502	28	34	27	21	22	15	0	0	0	21	782,976	4,490,453	163	1.5
R-503	28	34	27	21	22	15	0	0	0	21	782,974	4,490,481	163	1.5
R-504	28	33	27	20	21	14	0	0	0	21	783,012	4,490,455	163	1.5
R-505	27	33	27	20	21	14	0	0	0	21	783,061	4,490,471	163	1.5
R-506	27	33	27	20	21	14	0	0	0	21	783,095	4,490,460	163	1.5
R-507	27	33	26	20	21	13	0	0	0	20	783,152	4,490,482	161	1.5
R-508	27	33	27	20	21	13	0	0	0	20	783,136	4,490,513	160	1.5
R-510	27	33	27	20	21	14	0	0	0	21	783,059	4,490,487	163	1.5
R-513	27	33	27	20	21	14	0	0	0	21	783,095	4,490,529	162	1.5
R-514	27	33	26	20	21	13	0	0	0	20	783,147	4,490,588	156	1.5
R-516	27	33	27	20	21	14	0	0	0	21	783,092	4,490,588	159	1.5
R-519	27	33	26	20	21	13	0	0	0	20	783,127	4,490,720	151	1.5
R-520	27	33	27	20	21	14	0	0	0	21	783,035	4,490,826	150	1.5
R-521	28	33	27	20	22	15	0	0	0	21	782,969	4,490,806	155	1.5
R-523	27	33	27	20	21	14	0	0	0	21	783,048	4,490,719	154	1.5
R-525	28	34	27	20	22	15	0	0	0	21	782,964	4,490,763	156	1.5
R-527	28	33	27	20	21	14	0	0	0	21	783,006	4,490,653	159	1.5
R-528	27	33	27	20	21	14	0	0	0	21	783,051	4,490,691	156	1.5
R-529	28	33	27	20	21	14	0	0	0	21	783,012	4,490,612	161	1.5
R-530	27	33	27	20	21	14	0	0	0	21	783,055	4,490,642	158	1.5
R-531	28	33	27	20	21	14	0	0	0	21	783,010	4,490,596	161	1.5
R-532	27	33	27	20	21	14	0	0	0	21	783,053	4,490,597	161	1.5
R-533	28	33	27	20	21	14	0	0	0	21	783,014	4,490,566	162	1.5
R-534	27	33	27	20	21	14	0	0	0	21	783,062	4,490,569	161	1.5
R-535	28	33	27	20	21	14	0	0	0	21	783,015	4,490,515	163	1.5
R-537	28	33	27	20	21	14	0	0	0	21	783,023	4,490,494	163	1.5
R-538	28	34	27	20	22	15	0	0	0	21	782,984	4,490,527	163	1.5
R-539	28	34	27	21	22	15	0	0	0	21	782,965	4,490,493	163	1.5
R-540	28	34	27	21	22	15	0	0	0	21	782,962	4,490,588	162	1.5
R-541	28	34	27	21	22	15	0	0	0	21	782,963	4,490,608	161	1.5
R-545	28	34	28	21	22	15	0	0	0	22	782,916	4,490,562	162	1.5
R-546	28	34	28	21	22	15	0	0	0	22	782,914	4,490,630	161	1.5
R-547	28	34	28	21	22	15	0	0	0	22	782,919	4,490,690	160	1.5
R-548	28	34	28	21	22	15	0	0	0	22	782,891	4,490,724	159	1.5
R-550	28	34	28	21	22	15	0	0	0	22	782,890	4,490,759	158	1.5
R-551	28	34	27	21	22	15	0	0	0	22	782,908	4,490,794	156	1.5
R-552	28	33	27	20	22	14	0	0	0	21	782,966	4,490,842	153	1.5
R-553	28	34	28	21	22	15	0	0	0	22	782,880	4,490,867	155	1.5
R-557	28	34	27	21	22	15	0	0	0	22	782,898	4,490,901	153	1.5
R-558	27	33	27	20	21	14	0	0	0	21	783,029	4,490,884	149	1.5
R-559	28	34	27	21	22	15	0	0	0	21	782,896	4,490,919	152	1.5
R-560	28	33	27	20	21	14	0	0	0	21	782,955	4,490,964	148	1.5
R-561	28	33	27	20	21	14	0	0	0	21	782,956	4,491,005	147	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-562	28	34	27	21	22	15	0	0	0	21	782,892	4,490,936	151	1.5
R-566	27	33	27	20	21	14	0	0	0	21	782,941	4,491,105	147	1.5
R-567	28	34	27	20	22	15	0	0	0	21	782,887	4,491,088	149	1.5
R-569	28	34	27	20	22	15	0	0	0	21	782,894	4,491,046	148	1.5
R-571	28	34	27	21	22	15	0	0	0	21	782,896	4,491,026	148	1.5
R-572	28	34	27	21	22	15	0	0	0	21	782,902	4,490,961	150	1.5
R-573	28	34	27	21	22	15	0	0	0	21	782,900	4,490,997	149	1.5
R-574	28	34	27	21	22	15	0	0	0	21	782,883	4,490,977	150	1.5
R-578	28	34	27	20	22	15	0	0	0	21	782,883	4,491,109	149	1.5
R-579	28	33	27	20	21	14	0	0	0	21	782,883	4,491,158	149	1.5
R-580	28	33	27	20	21	14	0	0	0	21	782,890	4,491,142	148	1.5
R-581	27	33	27	20	21	14	0	0	0	21	782,890	4,491,208	148	1.5
R-583	28	34	27	21	22	15	0	0	0	22	782,782	4,491,203	149	1.5
R-584	28	34	27	21	22	15	0	0	0	21	782,819	4,491,194	149	1.5
R-586	28	34	28	21	22	15	0	0	0	22	782,770	4,491,169	150	1.5
R-587	28	34	28	21	22	15	0	0	0	22	782,786	4,491,153	150	1.5
R-588	28	34	28	21	22	15	0	0	0	22	782,779	4,491,134	150	1.5
R-590	28	34	28	21	23	16	1	0	0	22	782,733	4,491,087	153	1.5
R-591	28	34	28	21	22	15	0	0	0	22	782,774	4,491,088	153	1.5
R-593	28	34	28	21	22	16	0	0	0	22	782,774	4,491,063	154	1.5
R-594	28	34	28	21	22	16	0	0	0	22	782,779	4,491,045	155	1.5
R-595	29	34	28	22	23	16	1	0	0	23	782,711	4,491,003	158	1.5
R-596	29	34	28	21	23	16	1	0	0	22	782,730	4,490,990	158	1.5
R-597	28	34	28	21	22	16	0	0	0	22	782,778	4,491,006	156	1.5
R-599	29	34	28	22	23	16	1	0	0	23	782,718	4,490,974	159	1.5
R-600	29	34	28	22	23	16	1	0	0	23	782,723	4,490,952	160	1.5
R-601	29	34	28	22	23	16	1	0	0	23	782,725	4,490,931	160	1.5
R-602	28	34	28	21	22	16	0	0	0	22	782,802	4,490,907	156	1.5
R-603	29	34	28	22	23	16	1	0	0	23	782,733	4,490,910	160	1.5
R-604	28	34	28	21	23	16	1	0	0	22	782,791	4,490,878	157	1.5
R-605	29	35	28	22	23	16	1	0	0	23	782,735	4,490,884	159	1.5
R-606	28	34	28	21	23	16	1	0	0	22	782,789	4,490,840	158	1.5
R-607	29	35	28	22	23	17	2	0	0	23	782,720	4,490,842	160	1.5
R-608	28	34	28	21	23	16	1	0	0	22	782,795	4,490,818	159	1.5
R-609	29	35	28	22	23	16	2	0	0	23	782,737	4,490,825	160	1.5
R-610	29	35	28	22	23	16	2	0	0	23	782,747	4,490,749	160	1.5
R-611	28	34	28	21	23	16	1	0	0	22	782,793	4,490,800	159	1.5
R-612	29	35	28	22	23	16	2	0	0	23	782,748	4,490,719	160	1.5
R-613	28	34	28	21	23	16	1	0	0	22	782,797	4,490,768	159	1.5
R-614	29	35	28	22	23	16	2	0	0	23	782,751	4,490,699	160	1.5
R-616	29	35	28	22	23	17	2	0	0	23	782,750	4,490,684	161	1.5
R-617	29	35	28	22	23	17	2	0	0	23	782,746	4,490,658	161	1.5
R-619	29	35	28	22	23	17	2	0	0	23	782,755	4,490,624	161	1.5
R-620	29	34	28	22	23	16	1	0	0	22	782,798	4,490,660	161	1.5
R-621	29	35	28	22	23	17	2	0	0	23	782,756	4,490,606	161	1.5
R-622	29	35	28	22	23	17	2	0	0	23	782,753	4,490,585	161	1.5
R-623	29	35	28	22	23	17	2	0	0	23	782,762	4,490,553	161	1.5
R-624	29	34	28	22	23	16	1	0	0	22	782,800	4,490,645	162	1.5
R-627	29	34	28	22	23	16	1	0	0	22	782,801	4,490,609	162	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-628	29	35	29	22	23	17	2	0	0	23	782,702	4,490,742	161	1.5
R-629	28	34	28	21	23	16	1	0	0	22	782,821	4,490,573	162	1.5
R-630	29	34	28	21	23	16	1	0	0	22	782,815	4,490,477	162	1.5
R-631	29	35	28	22	23	17	2	0	0	23	782,757	4,490,516	161	1.5
R-632	29	35	28	22	23	17	2	0	0	23	782,756	4,490,492	161	1.5
R-634	29	35	29	22	24	17	3	0	0	23	782,634	4,490,803	164	1.5
R-635	29	35	29	23	24	18	4	0	0	24	782,636	4,490,503	161	1.5
R-637	29	35	29	23	24	18	4	0	0	24	782,640	4,490,532	161	1.5
R-638	29	35	29	23	24	18	4	0	0	24	782,634	4,490,595	161	1.5
R-639	29	35	29	22	23	17	2	0	0	23	782,697	4,490,744	161	1.5
R-640	29	35	29	23	24	18	4	0	0	24	782,631	4,490,671	162	1.5
R-641	29	35	29	22	24	17	3	0	0	24	782,630	4,490,739	163	1.5
R-642	29	35	29	23	24	18	4	0	0	24	782,627	4,490,708	162	1.5
R-643	29	35	29	23	24	18	4	0	0	24	782,635	4,490,559	161	1.5
R-650	29	35	29	22	24	17	3	0	0	23	782,638	4,490,794	164	1.5
R-652	29	35	29	22	24	17	3	0	0	23	782,629	4,490,897	163	1.5
R-654	29	35	29	22	24	17	3	0	0	23	782,613	4,490,977	160	1.5
R-655	29	35	29	22	24	17	3	0	0	23	782,610	4,491,010	159	1.5
R-656	29	35	29	22	24	17	3	0	0	23	782,543	4,491,181	157	1.5
R-657	29	35	29	22	23	17	3	0	0	23	782,607	4,491,045	159	1.5
R-659	29	35	28	22	23	17	2	0	0	23	782,602	4,491,158	156	1.5
R-667	28	34	27	21	22	15	0	0	0	21	782,513	4,491,700	145	1.5
R-668	28	34	28	21	22	15	0	0	0	22	782,482	4,491,656	145	1.5
R-672	28	34	27	20	22	15	0	0	0	21	782,574	4,491,657	146	1.5
R-676	28	34	28	21	22	15	0	0	0	22	782,444	4,491,653	147	1.5
R-677	28	34	28	21	22	16	0	0	0	22	782,407	4,491,647	149	1.5
R-678	28	34	28	21	23	16	1	0	0	22	782,407	4,491,595	150	1.5
R-679	28	34	28	21	23	16	1	0	0	22	782,372	4,491,647	150	1.5
R-680	29	34	28	22	23	16	1	0	0	22	782,375	4,491,597	152	1.5
R-681	29	35	28	22	23	16	2	0	0	23	782,350	4,491,586	152	1.5
R-682	29	34	28	22	23	16	1	0	0	23	782,333	4,491,638	151	1.5
R-683	29	35	28	22	23	16	2	0	0	23	782,311	4,491,626	152	1.5
R-685	29	35	29	22	23	17	2	0	0	23	782,303	4,491,556	154	1.5
R-686	29	35	29	22	23	17	2	0	0	23	782,270	4,491,597	153	1.5
R-687	29	35	29	22	23	17	2	0	0	23	782,255	4,491,610	154	1.5
R-688	29	35	29	22	23	17	2	0	0	23	782,232	4,491,640	155	1.5
R-689	29	35	29	22	24	17	3	0	0	23	782,185	4,491,625	156	1.5
R-690	29	35	29	22	24	17	3	0	0	24	782,177	4,491,590	156	1.5
R-691	29	35	29	22	24	17	3	0	0	23	782,244	4,491,555	155	1.5
R-692	29	35	29	22	24	17	3	0	0	23	782,217	4,491,572	156	1.5
R-693	29	35	29	22	24	17	3	0	0	23	782,289	4,491,527	154	1.5
R-694	29	35	29	23	24	18	4	0	0	24	782,212	4,491,514	156	1.5
R-695	29	35	29	22	24	17	3	0	0	24	782,264	4,491,495	155	1.5
R-697	30	36	29	23	25	18	5	0	0	24	782,182	4,491,471	158	1.5
R-698	30	36	30	23	25	19	5	0	0	25	782,178	4,491,412	157	1.5
R-699	30	36	29	23	24	18	4	0	0	24	782,233	4,491,447	156	1.5
R-700	30	36	29	23	24	18	5	0	0	24	782,256	4,491,392	156	1.5
R-701	29	35	29	22	24	18	3	0	0	24	782,302	4,491,447	155	1.5
R-702	30	35	29	23	24	18	4	0	0	24	782,303	4,491,391	156	1.5

Mackinaw Solar - Pre-Construction Sound Assessment
Appendix C - Receptor Locations and Nighttime Operational Noise Modeling Results

Receptor ID	Octave Band Sound Level (dB)									A-weighted Sound Level (dBA)	X (UTM 15N)	Y (UTM 15N)	Z ground	Height
	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz		m	m	m	m
R-703	29	35	29	22	23	17	3	0	0	23	782,378	4,491,454	153	1.5

Notes: PL = Property Line
R = Noise Sensitive Receptor
* = Class B Land Use

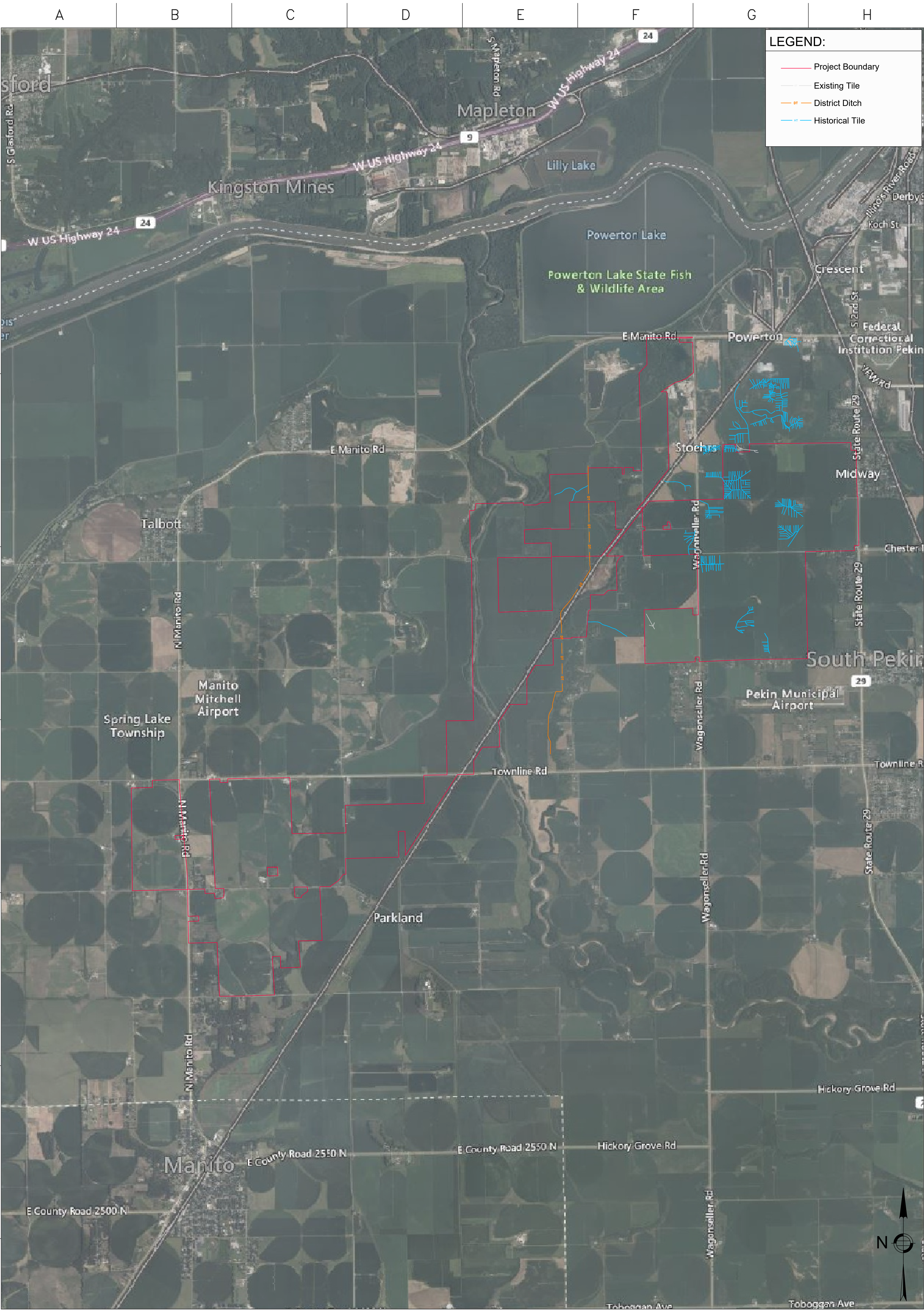
With every community, we redefine what's possible.

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.



Stantec Consulting Services Inc.
One Carlson Parkway North, Suite 100
Plymouth MN 55447-4440
stantec.com

Exhibit N
Drain Tile Map



DT-101

0

Dwg No:

Sheet Rev:

Drawing Title:

Drain Tile Mapping

Drawn by: J Dinger

Scale: 1"=40'

Project:

Mackinaw Solar

2700 NORTH MAIN STREET, MOWEAQUA, ILLINOIS 62550

Phone : (217) 768-4930, Fax : (217) 768-3041

Rev	Issued For	Date	Init
0	Review	8/10/26	JD



Exhibit O
Waste Management Plan

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit P
Visual Simulations

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit Q
Vegetation Management Strategy

Vegetation Management Strategies

Mackinaw Solar Project, Tazewell County

Executive Summary

Page | 1

The Mackinaw Solar Project offers a unique opportunity to pair renewable energy generation with improved soil health, diversified agricultural production, and long-term protection of productive farmland in Tazewell County, Illinois. This framework outlines site-specific land management strategies including native and perennial vegetation, integrated grazing, pollinator habitat, and protection of agricultural soils and drainage systems, to support a solar project that delivers community, agricultural, and environmental benefits.

Tazewell County's landscape is defined by intensive row-crop agriculture, with corn and soybeans dominating land use and farm economics. Soils in the Western Array Area are predominantly coarse-textured and erosion-prone; the Eastern Array Area is dominated by finer-textured loam soils. On the Illinois Soil Productivity Index, the Western Array Area averages about 91 and the Eastern Array Area about 107, and less than 0.1% of the site exceeds the PI of 125 commonly used to gauge impact on prime farmland. These conditions make vegetation management a critical component of responsible solar development.

The proposed site-specific vegetation strategies prioritize pre-construction soil stabilization, permanent perennial ground cover, and forage-based grazing systems that protect soil structure, reduce wind erosion, and maintain water quality across the Project footprint. Doral's commitment to a no-grade construction approach eliminates the topsoil loss and profile inversion that grading typically causes on these sandy soils, reinforcing both the Agricultural Impact Mitigation Agreement (AIMA) obligations and the long-term soil productivity goals of this plan. These vegetation strategies also comply with the Stormwater Pollution Prevention Plan (SWPPP) and AIMA and satisfy the pollinator-friendly vegetation plan requirement by Tazewell County.

Emerging research indicates that replacing annual row-crop production with permanent perennial vegetation beneath solar arrays can improve multiple indicators of soil health while enhancing broader ecosystem services. Across 30 solar facilities in the Midwest, Walston et al. (2021) found that restoring native grassland vegetation increased pollinator supply threefold, increased carbon storage by 65%, improved sediment retention by more than 95%, and increased water retention by 19% compared to pre-solar agricultural land uses. Recent studies of commercial solar grazing operations have similarly documented positive trends in soil health and pasture quality, demonstrating that well-managed vegetation can support both renewable energy production and long-term agricultural stewardship (Andrew et al., 2025).

Integrated grazing within and around the array supports small-scale livestock producers in a county where pastureland is limited, reduces vegetation management costs, and builds long-term soil health. Expanding sheep operations in the region have limited access to contiguous pasture, a gap this project is well positioned to fill, and represent a practical, scalable opportunity to diversify farm income, integrate livestock into crop-based systems, and make productive use of perennial vegetation established for site management. Pollinator plantings, designed around native prairie species matched to the site's sandy soils, provide continuous floral resources and support beneficial insects on and beyond the project boundary.

Rights-of-way and setback areas are intentionally incorporated into the project's land-use design, further expanding opportunities for Tazewell County farmers and landowners. These areas can

support perennial shrubs or tree crops, grazing pastures, pollinator habitat, bioenergy crops, or conventional field crops, offering expanded land-use options for local farmers and landowners while protecting farmland character and supporting farm viability across the project's operational life.

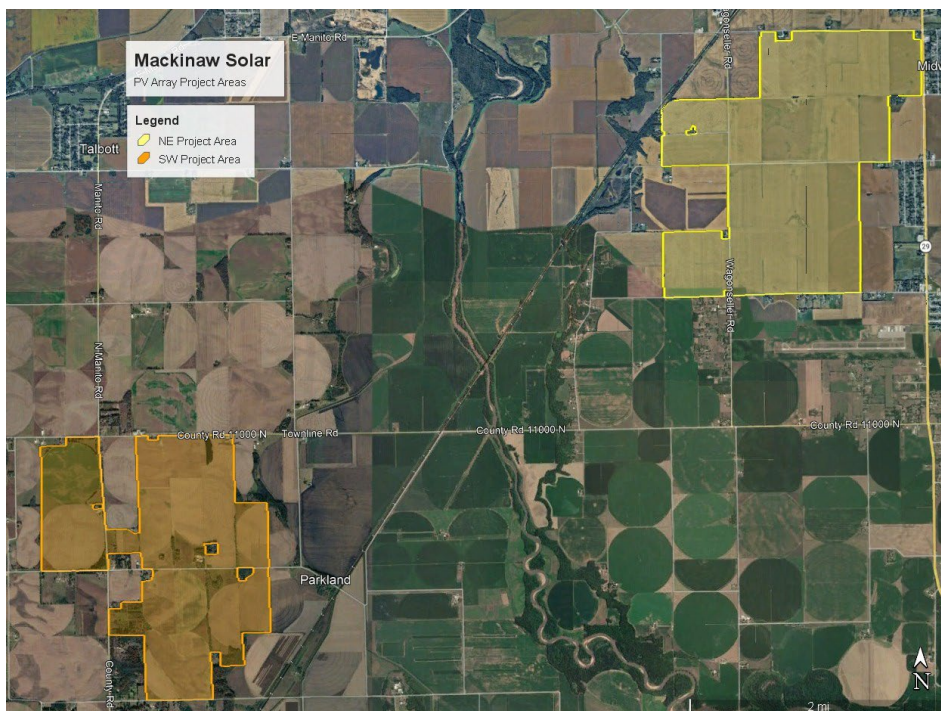
Overall, this vegetation framework demonstrates how solar development, when designed with agricultural and ecological goals at the forefront, can generate meaningful new opportunities for Tazewell County. The Mackinaw Solar Project can deliver clean energy while strengthening working lands, supporting local producers, protecting soil and water resources, and contributing to the county's environmental quality and economic vitality for decades to come.

I. Introduction

The vegetation management strategies outlined in this report focus on active farmland within the Project Area and emphasize practical, agriculture compatible approaches. These include pre-construction soil stabilization, permanent vegetative cover, targeted pollinator plantings, and integrated grazing where appropriate. Collectively, these strategies support responsible solar development while maintaining the long-term productivity and viability of Tazewell County's agricultural lands.

The Project Area lies within an actively managed agricultural landscape where vegetation establishment, soil and drainage system protections are critical to both construction feasibility and long-term land performance. As a result, the project footprint includes land uses that require differentiated vegetation strategies, including:

- Productive agricultural soils actively managed for row-crop production
- Field edges, buffers, and non-cropped areas suitable for perennial vegetation enhancement
- Areas with active subsurface tile drainage systems



These conditions make vegetation management a critical component of responsible solar development, ensuring long-term site stability, compatibility with neighboring agricultural operations, and protection of natural resources. In addition, Tazewell County's evolving agricultural landscape presents opportunities to integrate agricultural uses such as grazing and agrivoltaics into solar development.

This document covers vegetation within the Project Area boundary and includes a pollinator-friendly vegetation plan for areas inside and outside of the perimeter fence. This document also offers strategies to advance agriculture in setback, buffer, and right-of-way areas outside the fence. It is intended for submission as part of the building permit application. The Tazewell County Soil and Water Conservation District (SWCD) is a primary partner in finalizing species selection, seeding rates, and placement specifications prior to installation; any modifications resulting from that coordination will be documented and provided to Tazewell County for review.

II. Agricultural Resource Assessment

Local Agriculture

Agriculture is a defining feature of Tazewell County's landscape and local economy. Row-crop production dominates the county, with 92% of its approximately 344,000 farm acres devoted to cropland, primarily corn and soybeans. Together, these two crops accounted for nearly 290,000 harvested acres in 2022. Tazewell County also stands out for its specialty crop production, particularly pumpkins. Much of this production supplies Libby's pumpkin processing plant in Morton, Illinois, known as the "Pumpkin Capital of the World." Vegetable acreage, wheat, and hay are present but limited, reflecting the county's focus on high-value crops and efficient land use. However, there is growing interest in expanding specialty vegetables, fruit crops, and value-added processing, supported by proximity to food processing facilities and regional markets.

Livestock production is a minor part of the county's production, with small-scale sheep, cattle, and poultry operations integrated into crop-based systems. Pasture acreage is minimal, but opportunities exist for niche livestock enterprises that rely on perennial vegetation, cover crops, or managed grazing. Notably, Tazewell's strong crop sector provides a foundation for innovative integrated systems, such as raising sheep on cover crops and within solar arrays, which can improve soil health, diversify farm income, and supply specialty meat markets. These diversified livestock operations, while relatively small, can yield high-value products and make use of resources that row cropping alone might not fully utilize.

Tazewell's agricultural landscape continues to evolve, with farmers exploring diversification through specialty crops, integrated livestock systems, and conservation practices. Given Tazewell County's agricultural profile, this solar project can contribute meaningfully to:

- Advancing agricultural diversification through integrated production systems on field margins and erosion-prone soils
- Improving long-term soil health and productivity through reduced disturbance, continuous cover, and regenerative land-use practices
- Supporting local forage, grazing, and livestock needs through compatible vegetation choices in non-array areas

- Enabling agrivoltaics and diversified co-use of land within setbacks, buffers, and selected areas
- Providing alternative income streams and land-use partnerships
- Integrating pollinator habitat in ways that complement and benefit surrounding row-crop systems

The combination of intensive crop production, specialty agriculture, and emerging integrated livestock systems positions Mackinaw Solar to advance a model of solar development that supports renewable energy generation while strengthening agricultural viability, soil health, ecological restoration, and community benefits.

Soils and Land Use History

Mackinaw Solar project spans two Array Areas totaling approximately 3,880 acres in Tazewell County, Illinois, within an outwash plain and stream terrace landscape. The Western Array Area (~1,440 acres) is dominated by coarse-textured, sandy soils derived from eolian (wind-deposited) sands and wind-modified outwash, rather than the heavy silt loam soils typical of much of central Illinois. The Eastern Array Area (~1,760 acres) includes a distinct soil profile—predominantly loam and fine sandy loam—with approximately 79% of its land classified as prime farmland. Historically, this landscape supported Sand Prairie, a native plant community adapted to drought, low-organic-matter, and wind-erosion-prone conditions. Most of the Project Area has been converted to row-crop agriculture, consistent with the county's broader pattern of intensive corn and soybean production. The coarse-textured soils that dominate the southern project area are at the less-productive end of the county's agricultural spectrum and carry farmland designations of statewide

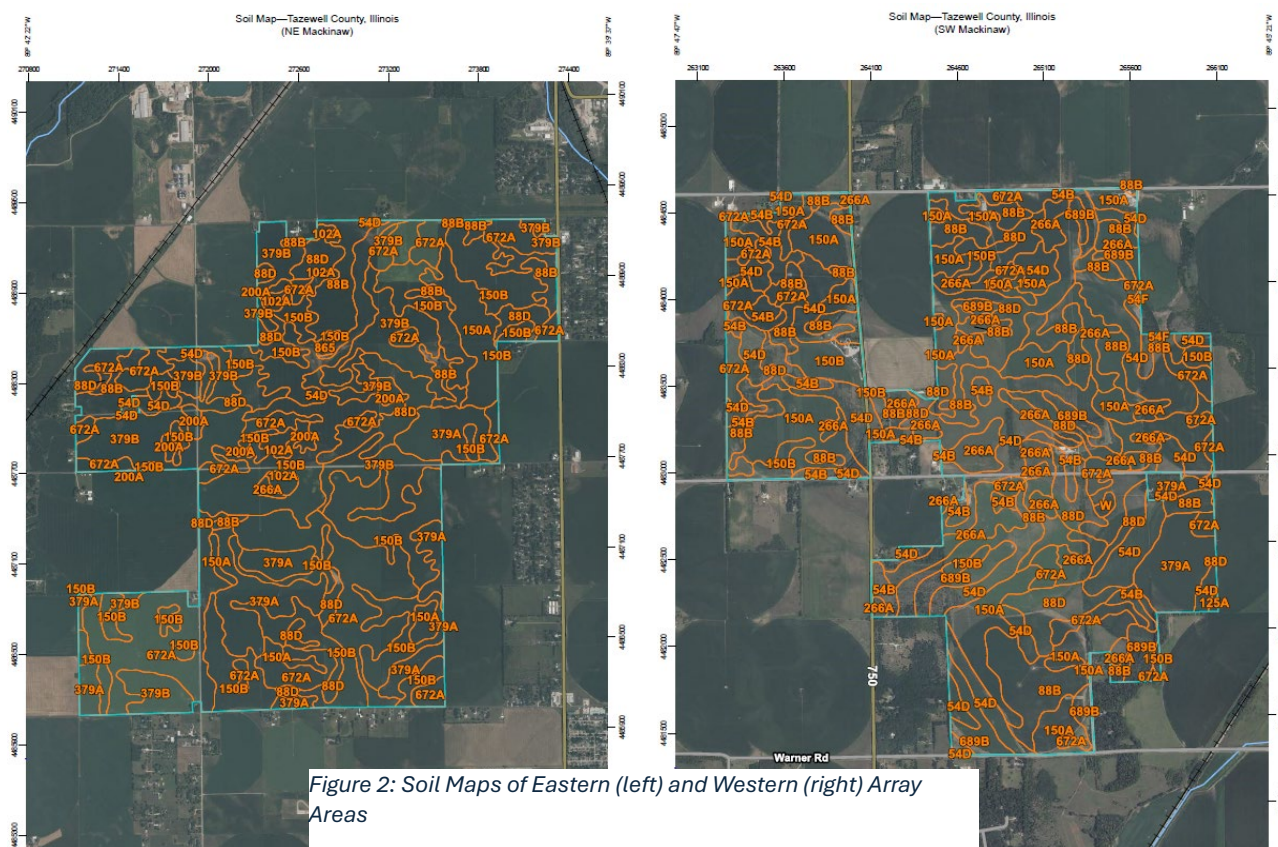


Figure 2: Soil Maps of Eastern (left) and Western (right) Array Areas

importance rather than prime, reflecting their inherent limitations in available water capacity and erosion susceptibility.

Dominant soil types vary between the Eastern and Western Array Areas. The following soils are present within the project boundary and inform vegetation and management strategies.:

Western Array Area

- *Plainfield sand* covers roughly 30% of the Western Array Area. These soils formed from eolian sands on outwash plains, are excessively drained, and have very low available water capacity. Water moves through the profile rapidly, making these soils highly susceptible to drought stress and wind erosion. The wind erodibility index for *Plainfield sand* is among the highest values in the county.
- *Sparta loamy sand*, on river valley outwash terraces and dunes, covers approximately 26% of the Western Array Area. Like *Plainfield sand*, these soils are excessively drained with a very low water table and limited available water capacity (~4.9 inches).
- *Onarga sandy loam* is the largest prime farmland unit on the Western Array Area, covering approximately 21% across both nearly level and gently sloping phases. These soils formed from outwash or eolian deposits, are well drained, have moderate available water capacity (~8 inches) and present no flooding or ponding risk. Wind erodibility index is 86 tons per acre per year.

Eastern Array Area

- *Dakota fine sandy loam* covers approximately 24% of the Eastern Array Area, including moderately steep phases where water erosion risk increases during construction. These soils are well drained, have moderate available water capacity, and are classified as prime farmland on gentler slopes. Steep-phase areas require additional erosion controls and sediment barriers during construction.
- *La Hogue loam* covers approximately 8 to 9% of the Eastern Array Area in low terrace positions and carries a seasonal high water table. These soils are classified as prime farmland and likely contain subsurface tile drainage; confirm tile locations during the pre-construction survey.
- *Orio loam* occupies approximately 5 to 6% of the Eastern Array Area in poorly drained depressions, is rated 98% hydric, and carries ponding risk. Subsurface tile drainage is likely present where adjacent fields drain through these positions.
- *Crescent loam* covers approximately 21% of the Eastern Array Area on stream terraces and outwash plains. These soils are well drained, classified as prime farmland on flat phases, and have low wind erodibility.

Soil Productivity Index

The Illinois Soil Productivity Index (PI) is a rating of a soil's potential to produce crops under high management, where higher values indicate more productive ground (University of Illinois Extension Bulletin 811). On this scale the two Array Areas sit far apart. The Western Array Area's coarse, excessively drained sands rate low, with an average (weighted) PI of approximately 91. These soils

are held back by very low available water capacity and high wind erodibility. The Eastern Array Area's loams and fine sandy loams rate substantially higher, with an average PI of 107, consistent with high percentage of prime farmland located there. This productivity gap is the primary reason vegetation, and management strategies differ between the two project areas.

Table 1. Illinois Bulletin 811 Soil Productivity Index by Map Unit

Map Unit	Map Unit Name	B811 Opt PI	Western Acres	Eastern Acres
54B	Plainfield sand, 1–7% slopes	76	82.4	—
54D	Plainfield sand, 7–15% slopes	76	311.4	74.8
54F	Plainfield sand, 15–45% slopes	76	0.8	—
88B	Sparta loamy sand, 2–6% slopes	92	268.7	106.3
88D	Sparta loamy sand, 6–12% slopes	92	152.7	123.1
102A	La Hogue loam, 0–2% slopes	121	—	23.8
125A	Selma loam, 0–2% slopes	129	1.2	—
150A	Onarga sandy loam, 0–2% slopes	110	208.4	75.3
150B	Onarga sandy loam, 2–5% slopes	110	51.7	495.3
200A	Orio loam, 0–2% slopes	110	—	27.5
266A	Disco sandy loam, 0–2% slopes	108	152.7	3.4
379A	Dakota fine sandy loam, 0–2% slopes	112	48.6	171.7
379B	Dakota fine sandy loam, 2–5% slopes	112	—	272.8
672A	Crescent loam, 0–2% slopes	117	88.6	386.5
689B	Coloma sand, 1–7% slopes	76	73.1	—
Weighted PI — unadjusted			94	108.4
Weighted PI — slope-adjusted			91	107
Total ratable acres			1,440	1,761

Figure 3 breaks these ratable acres out by Illinois soil class. Prime farmland (Classes A–C, PI 100 or above) covers 63% of the site, with 1,507 acres in Class C and 500 acres in Class B and no Class A acres. The remaining 37% rates at or below PI 99, split between 530 acres of farmland of statewide importance and 663 acres that are not prime. A PI of 125 is a common threshold for gauging solar's impact on the most productive farmland; at this site only Selma loam (PI 129) exceeds it, covering just 1.2 of the roughly 3,200 ratable acres, well under 0.1% of the project.

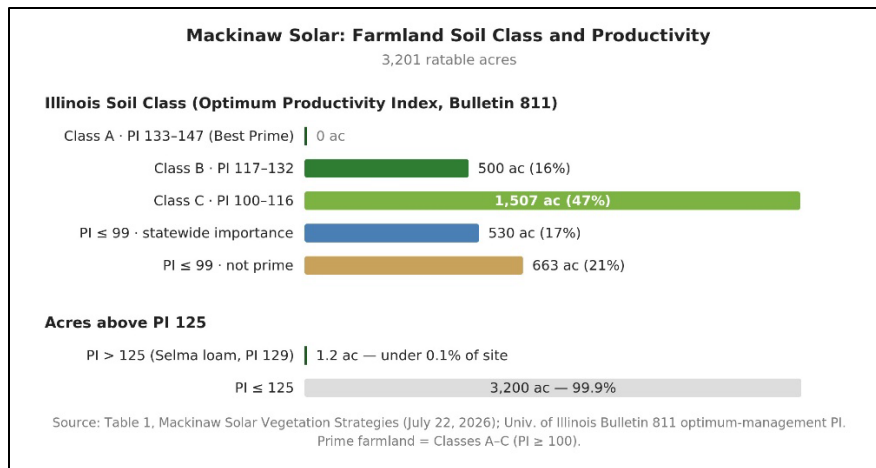


Figure 3: IL Soil Class and PI of Soils present at the Proposed Mackinaw Solar Project

Resource Concerns

The primary natural resource concerns within the Project Area relate to soil disturbance, erosion, and maintaining long-term soil function on intensively farmed, coarse-textured soils. These soils are particularly sensitive to surface disturbance and loss of protective cover, making erosion control and soil stabilization critical during construction and ongoing operations. Preventing the movement of sediment and agrichemicals caused by wind and water is essential to protecting adjacent cropland, drainageways, wetlands, and waterways. Well-established, continuous vegetative cover throughout all phases of the project is a key strategy for achieving these outcomes.

Water quality protection remains an important consideration in this intensively farmed landscape, where nutrient runoff from surrounding row-crop production contributes to regional water quality concerns. Reducing runoff through permanent vegetation and minimizing disturbance align with broader conservation efforts in the Illinois River watershed. Conservation practices commonly used in row-crop landscapes (i.e., cover crops, crop residue management, nutrient management, conservation tillage, field borders, and grassed waterways) remain directly applicable to the operation and maintenance of this solar-integrated farmland and provide meaningful benefits for runoff reduction and nutrient retention.

During installation of access roads and other equipment, topsoil should be separated, stockpiled, and saved for replacement during de-commissioning. The AIMA requires that disturbed soils be returned to productive agricultural condition at the end of the project's useful life. The vegetation strategies in this document support that outcome by maintaining continuous ground cover, minimizing compaction, and building soil organic matter throughout the operational period.

Construction activities pose the greatest risk to soil function, with compaction posing the most significant construction-related cause of soil degradation on agricultural soils. Severely compacted soils restrict water infiltration and air exchange, leading to ponding, increased runoff, reduced biological activity, and impaired root development of seeded vegetation. These impacts can delay vegetation establishment and reduce long-term soil productivity if not proactively managed. Traffic management and low-impact construction practices are critical to vegetation establishment.

Protecting farmland of statewide importance and long-term agricultural viability are key local priorities. As development pressures increase near nearby urban centers, integrating solar energy

production in a manner that maintains working lands and supports rural land stewardship remains an important local objective.

Subsurface (Tile) Drainage

Natural drainage on-site ranges from well-drained uplands to poorly drained depressions and reclaimed areas. Because perched water tables can develop where compacted layers or spoil material restrict downward movement, seasonal saturation in such areas will require careful placement of access roads and infrastructure to prevent long-term wet areas or structural settlement. Additionally, great care should be taken to understand where drainage tile laterals, mains, surface inlets, and outlets are located to ensure proper function for not only the controlled acres but also neighboring parcels.

Where tile systems are present:

- Sections with weak or aging tile may require upgrades or protective measures, as post-construction access is limited.
- Tile mains that cross from non-participating landowners should be verified and replaced if they are close to end of life as the ability/need to repair or upgrade will be difficult once the solar project is installed.

III. Vegetation Management Strategies

The strategies described in this section apply across distinct management zones within the approximately 3,400-acre Project footprint. A site map identifying each vegetation management zone, estimated acreage by zone, and the location of key soil types will be submitted with the building permit application. Table 2 provides a summary of applicable strategies and constraints by zone. Five vegetation management strategies guide this plan. They are:

- A. pre-construction vegetation establishment for soil stabilization,
- B. perennial native vegetation and pollinator habitat to reduce erosion risk and improve soil health while supporting habitat and water quality goals,
- C. pasture with forage species for grazing within and around the solar panels,
- D. weed management strategies, and
- E. expanded integration of agriculture into Rights-of-Way and setbacks.

Strategy placement follows the soil contrast between the two project areas. The Western Array Area's coarse, droughty, erosion-prone soils favor drought-tolerant perennial cover, pollinator mixes built on sandy-soil species, bioenergy plantings, and woody screening that holds marginal ground. The Eastern Array Area's prime-farmland loams carry higher agricultural value and support the project's strongest agricultural co-use opportunities: higher-carrying-capacity grazing, specialty and field crops in setbacks, and forage stands with meaningfully higher yields. Its tile-drained terraces and hydric depressions, chiefly La Hogue and Orio loams, require drainage protection and wet-tolerant species in low positions. Each strategy below is placed with this contrast in mind.

Table 2: Summary of Vegetation Strategies by Zone

Project Area	Soils	Resource Concerns	Management Zone	Strategies	Constraints and Considerations
Western	Course-textured sandy soils, farmland of statewide importance	Erosion prone	Interior	Grazing	Vegetation height limits; lower forage productivity and carrying capacity
				Native pollinator	Drought-tolerant perennial cover and sandy-soil pollinator mixes
			ROW/ Setbacks	Native pollinator	No panel-height restrictions; suitable for pollinator habitat, screening, and bioenergy crops
				Additional agriculture	Nut-bearing trees, shrub crops, specialty agricultural uses
Eastern	Prime-farmland, loam and fine sandy loam soils	Tile Drainage	Interior	Grazing	Higher forage yields and carrying capacity
				Native pollinator	Pollinator habitat and wet-tolerant species in low areas
			ROW/ Setbacks	Additional agriculture	Strongest opportunities for specialty crop production and diversified agriculture
				Native pollinator	Pollinator habitat; concentrate perennial plantings along field edges to preserve productive farmland

A. Pre-construction Vegetation for Soil Stabilization

Pre-construction vegetation establishment is a required component of the Project's SWPPP. Soils across the Mackinaw Solar Project Area must be stabilized before ground disturbance begins to protect soil structure and water quality during construction. The strategies outlined in this section function as best management practices (BMPs) consistent with SWPPP requirements, including the use of temporary cover crops, prompt seeding of disturbed areas, and maintenance of continuous ground cover in all areas not under active construction. The no-grade construction approach reinforces these commitments by eliminating the topsoil loss and profile inversion that grading typically causes on sandy terrace soils. The SWPPP and the AIMA govern where any provision of this vegetation plan conflicts with their requirements. The Western Array Area includes moderately steep slopes on Plainfield sand and Sparta loamy sand. These slopes carry higher water erosion risk than the flatter terrain that dominates the Eastern project area. Erosion control measures on these units should include slope-length-appropriate silt fencing, straw wattles or erosion control blankets on disturbed slopes, and prompt cover crop seeding within 14 days of disturbance.

Pre-construction stabilization will focus on maintaining continuous ground cover in all disturbed areas, implementing best management practices (BMPs) prior to and throughout construction to limit surface disturbance, reduce erosion risk, and preserve soil structure, thus preserving long-term agricultural productivity and soil health of active farmland within the Mackinaw Solar Project.

Recommended species for this purpose include annual cereal grasses and legumes (see below), which offer benefits like erosion control and nitrogen enrichment. The specific species will be selected based upon timing on installation and could also include forage and pasture species) which can be grazed.

- **Fall installation:** Winter wheat (*Triticum aestivum*) or cereal rye (*Secale cereale*).

- **Spring/Summer installation:** Oats (*Avena sativa*) or a cereal rye-oat blend.
- **Supplemental nitrogen (optional):** a terminating annual legume only — crimson clover or field peas.

All temporary seeding and vegetation establishment will follow the project's SWPPP and AIMA to ensure compliance with erosion-control requirements and to minimize impacts to active farmland. Seeding methods must ensure strong seed-to-soil contact and the creation of a firm seedbed to support germination across the variable farmland soils of the Mackinaw Solar Project Area. Drilling is preferred for most sites and broadcasting reserved for small areas where drilling is not feasible. All seeding operations should result in the seed being placed in contact with mineral soil, in a firm seedbed, and in non-competitive cover. All pre-construction stabilization activities must conform to the project's AIMA, which establishes binding obligations for soil protection, tile drainage repair, and land restoration throughout construction and into decommissioning.

B. Perennial Native Vegetation Establishment

Vegetation seed mixes were reviewed by Tazewell County Soil and Water Conservation District (SWCD) and USDA Natural Resource Conservation Service (NRCS) staff, who provided technical assistance and recommendations based upon NRCS conservation practice standards. Species were selected based on site-specific soil conditions, construction impacts, and long-term stabilization needs. To maintain appropriate vegetation height under the solar array and reduce shading risks, the planting strategy prioritizes short stature and low growing native and pasture species where feasible. Native short stature grasses may include species such as short prairie grasses and cool season mixes, which are more manageable beneath solar panels compared to tall, warm season prairie grasses, which present establishment challenges and are generally incompatible with solar energy generation.

Adaptive management, such as adjusting mowing frequency, modifying grazing intensity (if applicable), or supplementing seedings in areas with uneven establishment, can help ensure that vegetation continues to meet SWPPP expectations. In non-grazed areas of perennial vegetation, ongoing evaluation of native prairie species performance may help identify opportunities to enhance pollinator support or adjust species mixes based on site moisture, shading, and soil conditions. This strategy also helps build soil organic matter, improve rooting depth, and create long-term vegetative cover capable of supporting both ecosystem services and agricultural functions while remaining compatible with solar energy generation.

Research supports these expected outcomes. Walston et al. (2021) found that restoring native perennial vegetation beneath utility-scale solar facilities substantially improved ecosystem services compared to previous agricultural land uses, including greater carbon storage, pollinator habitat, and both sediment and water retention. These findings reinforce the role of diverse perennial vegetation as both a soil conservation practice and an agricultural land stewardship strategy.

Pollinator Habitat

While many of the native habitat species appropriate for Mackinaw Solar are also pollinator-friendly species, in compatible areas within the solar array, pollinator habitat will be established and maintained in accordance with best management practices and guidance developed by Illinois Department of Natural Resources (IDNR) and Illinois-based experts. Species mixes will be designed

to provide continuous floral resources across early, mid, and late-season bloom periods and, to the extent practicable, will prioritize native Illinois prairie species.

Pollinator habitat design for the Mackinaw Solar Project aligns with IDNR Pollinator Habitat Scorecard standards. Preliminary species lists and seed mixes developed during this planning stage are based on the range of soil conditions across the project: sandy outwash in the southern project area and loam to fine sandy loam in the northern project area, the planned buffer widths, and the commitment to a native vegetation program. However, the species lists presented in this appendix are planning stage working documents. Final species selection, seeding rates, and placement specifications will be developed in coordination with the Tazewell County SWCD and NRCS. Species availability, ecotype sourcing, and site conditions observed during pre-construction survey may result in adjustments to the mixes prior to installation. Formal scorecard documentation will be prepared and submitted once final seed mixes are confirmed, and installation plans are complete.

See **Appendix A** for native pollinator species list.

C. Pasture Vegetation for Grazing

Agricultural census data indicates that Illinois, including Tazewell County, has active small-scale sheep operations as part of its diverse agricultural landscape. The Mackinaw Solar Project offers secure, fenced, contiguous acreage that is otherwise difficult for small and mid-scale sheep producers to assemble in Tazewell County, where the availability of pastureland is limited and competes with row crops. Illinois already has established solar grazing operators serving multiple counties, indicating that regional supply chains are forming and could extend into Tazewell County as projects come online and national research shows solar grazing can generate above-average farm profitability compared to traditional livestock systems, particularly at scale.¹

In support of the project's commitment to sustaining agricultural production within the project area, Doral has established a scholarship program for local shepherds and graziers to pursue certification through the American Solar Grazing Association (ASGA). This initiative reflects Doral's broader goal of building local workforce capacity and job training opportunities in advance of construction, ensuring that the community has trained personnel ready to support agrivoltaic grazing operations once the project becomes operational. Rather than removing land from agricultural use, the project is designed to support a transition to livestock grazing — particularly sheep — within portions of the site, a land use that offers documented benefits for soil health, organic matter retention, and long-term soil regeneration. Doral is also evaluating other forms of agrivoltaic production, such as pollinator habitat, native grasses, and other compatible crops, to determine the best fit for specific areas of the site based on soil conditions, topography, and surrounding land use. Taken together, these efforts reinforce the site's continued contribution to the local agricultural economy throughout the life of the project.

Common sheep breeds raised in Tazewell County and the surrounding region include Suffolk, Hampshire, Dorset, Southdown, Shropshire, and Katahdin, as well as various crossbreeds, and are all grazed successfully at solar sites in Illinois. Both hair and wool sheep breeds are suitable for grazing within solar facilities; typically, breed choice is less important than the grazing management practices adopted by operators.

¹ <https://u.osu.edu/sheep/2025/01/21/solar-shepherds-earn-big-by-grazing-sheep-on-solar-farms/>

Grazing areas will be seeded with a mix of grasses and legumes rather than grass-only forage. This approach can reduce fertilizer needs, improve erosion control, enhance sheep nutrition, and provide better pollinator habitat through flowering legumes. Recommended forage species for Tazewell County include cool-season grasses such as orchardgrass and tall fescue, with native warm-season species like little bluestem (*Schizachyrium scoparium*) used where appropriate. Legumes such as white (ladino) clover (*Trifolium repens*) provide high-quality sheep forage and can support native Illinois pollinators when allowed to flower. Annual legumes, including crimson clover, are better suited to short-term forage or cover crop use than to permanent pasture.

When establishing new forage stands, a companion or nurse crop such as oats or winter wheat may be used to reduce erosion and suppress weeds, depending on planting season and site conditions. Nurse crops should be planted at a rate of 30 pounds of seed per acre to safeguard the forage crop during initial growth.² The northern project area's loam-dominated soils have meaningfully higher NRCS grass-legume pasture yields than the sandy soils of the southern project area. La Hogue loam is the highest-yielding series on the project at approximately, followed by Crescent loam, Orio loam and Dakota fine sandy loam. Grazing operators should expect higher carrying capacity on Crescent and Dakota units in the northern project area relative to the sandy outwash soils of the southern area, and stocking rates should be calibrated accordingly.

D. Noxious Weed Management

Transitioning from continuous row-crop production to permanent perennial cover creates a predictable window of elevated weed pressure. Row-crop soils carry a dense seedbank of annual broadleaves and grasses held in check by tillage and herbicide programs that no longer apply after transition. For the first two growing seasons (before native forbs, bunchgrasses, and forage legumes close the canopy) opportunistic annuals are the primary threat to establishment success. Weed management at Mackinaw Solar is built around that window: heavy intervention early, tapering as desirable vegetation takes hold.

The pre-construction year is the highest-leverage point in the program. A full-site noxious weed survey, targeted treatment of established populations, and a broadcast glyphosate burndown timed after crop harvest dramatically reduce the seedbank before any permanent seed goes in the ground. Once native and forage mixes are seeded, Year 1 management shifts to rotational mowing — three to four passes from June through September, cutting to 6 inches whenever weeds reach 10 to 12 inches — to prevent seed set and keep weed canopy off native seedlings without cutting into the prairie plants themselves. Native and pasture zones are managed on separate protocols, with forage areas eligible to enter light rotational grazing in Year 2 as established stands substitute for mowing.

By Year 3, well-established perennial vegetation on the site should require only targeted weed intervention rather than site-wide mowing campaigns. Monitoring through the establishment and transition phases will track vegetation cover by species group, noxious weed populations, and canopy closure relative to establishment benchmarks. The Tazewell County Weed Commissioner and USDA Natural Resource Conservation Service (NRCS) field office are the primary local contacts for compliance documentation and coordination with AIMA weed control requirements; pre-

² https://extension.illinois.edu/sites/default/files/resource_covercrop_forage_2022.pdf
https://efotg.sc.egov.usda.gov/api/CPSFile/32749/512_IL_PS_Pasture_and_Hay_Planting_2021

construction weed mapping will be completed in coordination with both offices before ground disturbance begins.

See **Appendix B** for noxious weed species and other high-priority non-statutory species.

E. Rights-of-Way (ROW) and Setbacks

Areas outside the array fence are governed in part by Tazewell County which establishes minimum setbacks of 50 feet from public road rights-of-way and from the boundary lines of nonparticipating properties, and 150 feet from nonparticipating dwellings and occupied community buildings. These zones, along with additional rights-of-way and perimeter areas beyond the fence, provide meaningful land-use opportunities that complement Tazewell County's crop-centric agricultural economy. Because these areas are outside the array fence, they are not subject to the panel-height vegetation constraints, allowing a broader range of production systems that complement Tazewell County's crop-centric agricultural economy while expanding access to specialty crops, integrated livestock systems, perennial plantings, and conservation-oriented uses. Selecting native species that provide pollinator habitat while still allowing for seasonal grazing or integrating specialty and perennial cropping systems, increases opportunities for local producers looking for land access, preserving more farmland for agricultural use.

Bioenergy Crops

Perennial bioenergy crops can serve as a multifunctional option in wider ROW and setback areas, particularly where conventional cropping is less efficient. Species such as *Miscanthus × giganteus* are well-suited to field edges and setback zones, providing dense, low-input perennial cover. *Miscanthus* is a high-biomass, low-input perennial capable of reaching 10 feet in height, providing both effective visual screening and durable soil stabilization. *Miscanthus × giganteus* is a sterile hybrid and does not pose invasive risk. Established stands contribute to carbon sequestration, erosion control, and improved soil structure over time. Biomass markets in the region include livestock bedding, biobased products, building materials, and emerging bioenergy applications, offering additional revenue potential for landowners and project partners. Bioenergy plantings are best directed to the southern project area, where *Miscanthus* tolerates the low-fertility, droughty sandy soils and makes productive use of ground that is marginal for conventional crops. In the northern area, bioenergy should be reserved for wider setbacks, so it does not displace prime-farmland production.

Additional Pasture Areas for Grazing

Within and adjacent to the array, pasture vegetation can serve as both a forage base for grazing and a complementary planting beneath screening trees and shrubs. ROW and setback areas provide particularly strong opportunities to expand pasture and forage-based systems in a county where pastureland is limited but interest in diversified livestock enterprises is growing. Unlike pasture established within the array, for areas outside of the array fencing, pasture species are not height limited, nor is the grazing limited exclusively to sheep. This provides greater flexibility for expanding local access to land for animal grazing operations, including small ruminants, pasture-raised poultry, or seasonal cattle grazing where appropriate, while improving soil cover and management of vegetation. The northern project area's higher-yielding loam soils offer the strongest forage base and carrying capacity for these expanded grazing systems. The southern area's sandy soils suit lower-density grazing on drought-tolerant species such as little bluestem.

Nut-bearing Trees

Tazewell County's agricultural history and climate can support a range of tree crops that can meet canopy requirements for optional vegetative screening around the Mackinaw Solar Project Area. Nut-bearing species, including hickory (*Carya ovata*), hybrid chestnut (*Castanea spp.*), and walnut varieties, are well-adapted to local soils and can reach mature heights exceeding 40 feet. These species establish relatively quickly (with walnuts often reaching 10 feet within five years) and offer long-term economic value through nut harvests. When integrated into ROW and setback areas, nut-bearing trees function as productive agroforestry systems, supporting specialty crop diversification, regional feed or value-added markets, and long-term farm resilience while also fulfilling screening and conservation functions. These trees are best suited to the southern project area's setbacks and screening zones, where their deep-rooted, low-input habit stabilizes sandy soils. On the northern prime farmland, screening plantings should be sited along field edges to avoid removing productive ground from agricultural use.

Shrub Crops

Shrub crops suitable for Tazewell County conditions include aronia (black chokeberry), serviceberry, and elderberry. These fruiting shrubs are both marketable and regionally appropriate, and several are already identified as appropriate pollinator-supporting species within Illinois-based native plant guidance. Aronia and serviceberry are well suited to ROW and setback areas due to their tolerance for variable soil conditions, low maintenance requirements, and limited tendency to spread beyond managed planting areas. Elderberry may also be appropriate in select locations where periodic management can accommodate its natural suckering habit. Regional specialty crop networks offer potential markets for locally grown berries and value-added products. Shrub crops fit well in southern setbacks and screening areas. Where sited in the northern project area, they should occupy field edges and buffers rather than prime-farmland interiors; aronia and elderberry also tolerate the moister conditions found in the northern area's low terrace and depressional positions.

Specialty Crop and Local Food Production

Moderate-scale specialty crop production aligns with Tazewell County's broader opportunities for agricultural diversification. Building on the county's success as a leading pumpkin producer and its capacity for vegetable production, these areas can host specialty vegetables or niche crops that supply fresh, processing, or institutional markets. In addition to pumpkins, opportunities for melons, squash, gourds, tomatoes, and small fruits can help diversify agricultural production while supporting the expansion of farm-to-consumer and local market channels. The county's relatively high concentration of organic farms and growing interest in local food systems also create opportunities for producers to test new crops. Smaller, accessible setback areas are especially well suited for growers testing new crops, participating in farm-to-institution or food-bank initiatives, or supplying nearby processing and distribution infrastructure. Recent Illinois Department of Agriculture (IDOA) investments through the USDA Specialty Crop Block Grant Program further support efforts to expand access to fresh, locally grown produce and strengthen the competitiveness of the state's specialty crop industry. The northern project area's prime-farmland loams are the most suitable ground on the site for specialty and vegetable production, including the pumpkins central to the county's economy. Setbacks and right-of-way areas adjacent to these soils are the priority locations for specialty crop co-use.

Field Crops

Agronomic annual crops familiar to local farmers may provide practical integration opportunities within setback areas of the Mackinaw Solar project, particularly during early project years before long-term perennial systems mature. Where shading from adjacent canopy trees is limited, areas outside of the array fencing may remain compatible with annual and rotational crop production, including corn, soybeans, small grains (such as winter wheat), hay and forage crops, and seasonal cover crop systems depending on management goals.

Page | 15

Short-term annual production can provide transitional income and maintain agricultural use of the land while long-term perennial systems, such as nut orchards, berry shrubs, pasture, or bioenergy crops are gradually established. Continued field-crop production is most viable in the northern project area's setbacks, where prime-farmland loams sustain corn, soybeans, and small grains. In the southern area, sandy soils make transitional field cropping more marginal and better suited to forage or cover-crop systems.

Appendix A: Site Vegetation Species List

Seeding rates and mix ratios are proposed and based on site-specific soil conditions, confirmed construction impacts, ecotype availability, and installation timing. NRCS Conservation Practice Standard 512 (Pasture and Hay Planting) and CPS 327 (Conservation Cover) provide applicable rate guidance for forage and native species mixes respectively and inform specifications. **Species and seeding rates have been reviewed favorably by the Tazewell County NRCS and SWCD.**

Pre-Construction Stabilization

Annual or short-lived cover only. Seeding rates per NRCS Practice Standard 342. Species and seeding windows are listed in Table 3.

Table 3: Pre-Construction Stabilization Cover Mix

Common Name	Scientific Name	Seeding Window	Notes
Cereal rye	<i>Secale cereale</i>	Fall/winter (Sep-Nov)	Primary fall option; excellent winter cover; terminates before spring permanent seeding; preferred for fall construction disturbance
Winter wheat	<i>Triticum aestivum</i>	Fall/winter (Sep-Nov)	Alternative to cereal rye; slightly less winter-hardy; similar performance
Oats	<i>Avena sativa</i>	Spring/summer (Mar-Jun)	Primary spring/summer option; winter-kills in central IL; will not persist into following season

Pasture Mix -- Inside Array

Cool-season agronomic grasses for erosion control and sheep grazing. Legumes/forb inclusion for diversity. Target total roughly 30-34 lb/ac PLS, upper end on D-class sandy and erosion-prone areas. Specify endophyte-free perennial ryegrass and inoculate all legumes before planting. **Confirm rates against actual seed-lot purity and germination before finalizing.**

Table 4: Pasture Mix, Inside Array

Species	% Mix	Rate (lb/ac PLS)	Notes
Orchardgrass (<i>Dactylis glomerata</i>)	25–30%	4-5	Primary grass anchor on silty soils; sod-forming; allow 4–6" regrowth before re-grazing; do not graze below 3"
Endophyte-free perennial ryegrass (<i>Lolium perenne</i>)	15–20%	6–7	Specify endophyte-free variety on seed order. Highly palatable; rapid establishment. Reduce proportion on drier areas
Kentucky bluegrass (<i>Poa pratensis</i>)	12–15%	3–4	Best sod-former; tolerates close grazing; slow first-year establishment
Meadow fescue (<i>Schedonorus pratensis</i> , syn. <i>Festuca pratensis</i>)	15–20%	7–8	Replaces tall fescue. More palatable year-round — softer leaf, low silica — and its endophyte is non-toxic, so no fescue toxicosis risk.
Birdsfoot trefoil (<i>Lotus corniculatus</i>)	8–12%	5–6	Primary legume. Non-bloating; excellent year-round sheep forage. Inoculate seed before planting; slow to establish, allow reseeding
Forage chicory (<i>Cichorium intybus</i>)	3–5%	1–2	Deep-rooted forb, not a legume. Highly palatable. Keep grazed to suppress bolting.

Species	% Mix	Rate (lb/ac PLS)	Notes
Ladino clover (<i>Trifolium repens</i>)	3–4%	½–1	Reduced proportion. Grazing-tolerant white clover; higher yielding than common white clover. Bloat risk on lush spring growth.
Medium red clover (<i>Trifolium pratense</i>)	5–7%	3–4	Reduced proportion. High palatability and yield. Bloat risk — maintain a grass-dominant sward.

Composition and bloat management. Grasses make up about 75% of the mix and forbs and legumes about 25%. Birdsfoot trefoil is the primary legume and does not cause bloat. The two bloat-prone clovers, ladino and medium red, are held to roughly 10% combined; maintain a grass-dominant sward to manage bloat risk. **Site preparation note.** Terminate any existing Ky-31 tall fescue on the site during the weed-control step. It persists aggressively and can reinfest a mix built to be free of fescue toxicosis.

Sandy / Hooks Substitution -- Excessively Drained Sandy Soils

Reduce or eliminate perennial ryegrass and Kentucky bluegrass. Add smooth brome grass, with alfalfa or birdsfoot trefoil as the legume. Substitution species are listed in Table 5.

Table 5: Pasture Mix Substitution Species for Sandy / Hooks Soils

Species	Soil & Moisture
Smooth brome grass (<i>Bromus inermis</i>)	Well-drained to excessively drained; droughty sandy loam to coarse sandy soils; drought tolerance M-H
Alfalfa (<i>Medicago sativa</i>)	Well-drained; pH >6.5 required; does not tolerate wet or seasonally saturated conditions
Birdsfoot trefoil (<i>Lotus corniculatus</i>)	Well-drained to moderately well-drained; pH flexible; tolerates moderate drought

Wet / Hydric Substitution -- Somewhat Poorly to Poorly Drained Positions

Remove Kentucky bluegrass, perennial ryegrass, and red clover, increase orchardgrass and meadow fescue. Add Alsike clover as primary legume. Substitution species are listed in Table 6.

Table 6: Pasture Mix Substitution Species for Wet / Hydric Positions

Species	Soil & Moisture
Alsike clover (<i>Trifolium hybridum</i>)	Tolerates seasonal saturation; preferred legume for wet pasture positions.

Native Pollinator Habitat Seed Mix -- Outside the Fence (inside as practical)

Perimeter and buffer (outside-array) - 23 species, all Illinois native. Seeding rates (in Pure Live Seed (PLS)) are proposed, not final, and are calculated by seeds per square foot per IDNR establishment guidelines. **The lb/ac figures use standard published seeds-per-pound references; confirm against actual seed-lot purity and germination before finalizing.**

Table 7: Native Pollinator Habitat Seed Mix, Outside the Fence

Species	Seeds/ft ²	lb/ac PLS	Height	Bloom	Pollinator value
GRAMINOIDS (6 species) — 10 seeds/ft² (25%) · 2.0 lb/ac PLS					
Side-oats grama (<i>Bouteloua curtipendula</i>)	2.0	0.58	18–30"	Jun–Sep	Pollen; specialist bees
Little bluestem (<i>Schizachyrium scoparium</i>)	2.5	0.45	24–36	Aug–Sep	Pollen; nesting structure; bird seed
Prairie dropseed (<i>Sporobolus heterolepis</i>)	1.0	0.18	18–24"	Aug–Sep	Fragrant flowers; bees, small flies
Prairie junegrass (<i>Koeleria macrantha</i>)	1.5	0.03	12–18"	May–Jun	Early pollen; ground-nesting structure
Virginia wild rye (<i>Elymus virginicus</i>)	1.5	0.59	24–36	Jun–Aug	Minimal; quick cover and nesting structure
Plains oval sedge (<i>Carex brevior</i>)	1.5	0.16	12–30"	May–Jun	Early-season cover; ground-nesting bee structure
FORBS (17 species) — 30 seeds/ft² (75%) · 7.4 lb/ac PLS					
<i>Spring bloom (April–May)</i>					
Prairie phlox (<i>Phlox pilosa</i>)	1.5	0.31	12–18"	Apr–Jun	Nectar and pollen; bees, butterflies
Golden alexanders (<i>Zizia aurea</i>)	1.5	0.65	12–30"	Apr–Jun	Nectar and pollen; specialist bees; swallowtail larval host
Spiderwort (<i>Tradescantia ohimensis</i>)	1.0	1.0	18–30"	May–Jul	Pollen specialists; bumble bees; native bees
Slender beardtongue (<i>Penstemon gracilis</i>)	2.0	0.20	12–24"	May–Jul	Penstemon specialist bees; bumble bees; very high bee value
<i>Summer bloom (June–August)</i>					
Butterfly weed * (<i>Asclepias tuberosa</i>)	1.5	1.0	12–30"	Jun–Aug	Monarch larval host; very high pollinator value
Prairie coreopsis (<i>Coreopsis palmata</i>)	2.0	0.41	18–30"	Jun–Jul	Bees, butterflies, beetles, wasps; Coreopsis specialist bees
Purple prairie clover (<i>Dalea purpurea</i>)	2.0	0.32	12–30"	Jun–Aug	Specialist bees; high native bee value; long bloom
Virginia mountain mint (<i>Pycnanthemum virginianum</i>)	2.0	0.10	12–24"	Jun–Aug	Premier pollinator; bumble and specialist bees, butterflies
Pale coneflower (<i>Echinacea pallida</i>)	2.0	0.75	24–36"	Jun–Jul	Bumble bees; specialist bees
Purple coneflower (<i>Echinacea purpurea</i>)	1.0	0.40	24–36"	Jun–Aug	Bumble and specialist bees; monarch nectar

Species	Seeds/ft ²	lb/ac PLS	Height	Bloom	Pollinator value
Ox-eye sunflower (<i>Heliopsis helianthoides</i>)	2.0	0.65	18–36"	Jun–Sep	Very high bee and butterfly value
Leadplant (<i>Amorpha canescens</i>)	1.5	0.25	24–36"	Jun–Jul	Specialist bees; bumble bees; high value
Black-eyed Susan (<i>Rudbeckia hirta</i>)	1.5	0.10	18–36"	Jun–Sep	Bees, beetles, butterflies; long bloom
<i>Fall bloom (September–October)</i>					
Rough blazing star (<i>Liatris aspera</i>)	2.5	0.81	18–36"	Aug–Oct	Monarch nectar; bumble and specialist bees
Stiff goldenrod (<i>Oligoneuron rigidum</i>)	2.5	0.25	18–36"	Aug–Oct	Exceptional fall value; bees, butterflies, wasps
Azure aster (<i>Symphyotrichum oolentangiense</i>)	2.0	0.10	12–24"	Sep–Oct	High fall value; bees; monarch nectar
Heath aster (<i>Symphyotrichum ericoides</i>)	2.0	0.10	12–24"	Aug–Oct	Exceptional fall value; bees; monarch nectar

Substitution Species for Wet / Hydric Zone Establishment

Swap these species into the base mix when seeding in low areas with seasonal saturation. Reduce or remove prairie junegrass, side-oats grama, and pale coneflower in persistently wet positions. Substitution species are listed in Table 8.

Table 8: Pollinator Mix Substitution Species for Wet / Hydric Zone

Species	Soil & Moisture
Prairie blazing star (<i>Liatris pycnostachya</i>)	Swap for rough blazing star in wet/moist areas
Wild quinine (<i>Parthenium integrifolium</i>)	Add in seasonal wet-mesic areas

Substitution Species for Sandy / Hooks Zone Establishment

Swap these species into the base mix when seeding on Hooks series and similar excessively drained sands. Reduce or remove prairie dropseed in excessively dry positions.

Table 9: Pollinator Mix Substitution Species for Sandy / Hooks Zone

Species	Soil & Moisture
Rough dropseed (<i>Sporobolus compositus</i>)	Swap for prairie dropseed on excessively drained sands
Purple lovegrass (<i>Eragrostis spectabilis</i>)	Additional matrix grass for sandy soils
Round-headed bush clover (<i>Lespedeza capitata</i>)	Swap for leadplant on droughty sands

Sources Consulted

USDA PLANTS Database (plants.usda.gov); NRCS Plant Guides and Fact Sheets (nrcs.usda.gov) including IL Pasture and Hay Planting (512) Guidance document.; Illinois IDNR Solar Site Pollinator Habitat Planning Form and Scorecard (dnr.illinois.gov/conservation/pollinatorscorecard); Xerces Society pollinator plant lists (xerces.org).

Appendix B: Noxious and Invasive Plant Species

The Illinois Exotic Weed Act (525 ILCS 10/) prohibits the sale, distribution, or introduction into commerce of listed exotic species, including autumn olive, bush honeysuckles, and purple loosestrife. It does not require removal of existing populations, but it prohibits deliberate planting and directly governs seed procurement and screening plantings for this project. All seed mixes, transplants, and erosion control materials used at this site must be free of Exotic Weed Act species.

Page | 20

The Illinois Noxious Weed Law (505 ILCS 100/, 8 Ill. Admin. Code Part 220) designates the following species as noxious weeds subject to mandatory control statewide. Property owners and occupants, including solar facility operators, are legally required to prevent listed species from spreading by seed or vegetative propagation.

- Canada thistle (*Cirsium arvense*) — high probability; perennial, spreads by rhizome, common on transitioning row-crop ground statewide
- Johnsongrass (*Sorghum halepense*) — high probability on sandy soils; already flagged in the preliminary plan
- Musk thistle (*Carduus nutans*) — moderate probability; biennial, common on disturbed and sandy ground in central Illinois, spreads rapidly along field edges and fence lines
- Perennial sowthistle (*Sonchus arvensis*) — lower probability but documented in Tazewell County; look along field margins, drainage ditches, and gravel access areas
- Giant ragweed (*Ambrosia trifida*) and common ragweed (*A. artemisiifolia*) — mandatory control applies only within incorporated municipalities

High-priority non-statutory species:

These are not legally mandated control species but are serious threats to native establishment and/or adjacent agriculture, and several have livestock safety implications relevant to the sheep grazing component.

- Poison hemlock (*Conium maculatum*) expanding rapidly across central Illinois; look along drainage ditches, field edges, and any disturbed or low-lying ground; lethal to sheep at low doses
- Field bindweed (*Convolvulus arvensis*) high probability on sandy positions; deep-rooted perennial, nearly impossible to eradicate once established; document colonies before grading
- Horseweed / maretail (*Erigeron canadensis*) near-certain presence given corn-soybean history; map density before seeding, as populations are often glyphosate-resistant
- Waterhemp (*Amaranthus tuberculatus*) — near-certain in the seedbank from prior cropping; Year 1 establishment threat
- Palmer amaranth (*Amaranthus palmeri*) expanding in Tazewell County; survey field interiors and any areas receiving imported organic material or contaminated seed
- Common cocklebur (*Xanthium strumarium*) — look along low-lying inclusions and field margins; toxic to sheep (seedling stage)
- Quackgrass (*Elymus repens*) perennial grass, spreads by rhizome; more common on the loamier positions; document before tillage or grading moves rhizomes
- Wild parsnip (*Pastinaca sativa*) biennial; contact with sap causes severe burns; increasingly common in central Illinois roadsides and field margins; worker safety concern during construction and O&M
- Common teasel (*Dipsacus fullonum*) biennial; common along drainage and river corridor and roadsides; dense colonies crowd out natives; on the Illinois Exotic Weed Act pending amendment list

References

- Andrew, A. C., Antoszewski, K., Goldberg, Z. A., Barter, J., Hain, L., DeSario, A., White, A., Roszell, C., Cole, E., Peterson, S., & Meys, B. (2025). Sheep grazing as sustainable vegetation management for solar energy production in the northeastern USA. *Frontiers in Sustainable Food Systems*, 9, 1625483. <https://doi.org/10.3389/fsufs.2025.1625483>
- Walston, L. J., Mishra, S. K., Hartmann, H. M., Hlohowskyj, I., McCall, J., & Macknick, J. (2021). Examining the potential for agricultural benefits from pollinator habitat at solar facilities in the Midwestern United States. *Ecosystem Services*, 52, 101357. <https://doi.org/10.1016/j.ecoser.2020.101227>

Exhibit R
Health and Safety Impacts of Solar Photovoltaics



NC CLEAN ENERGY
TECHNOLOGY CENTER

Health and Safety Impacts of Solar Photovoltaics

MAY 2017



NC STATE UNIVERSITY

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 (NO_x), and fine particulate matter (PM_{2.5}). 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 MW_{AC}) 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.

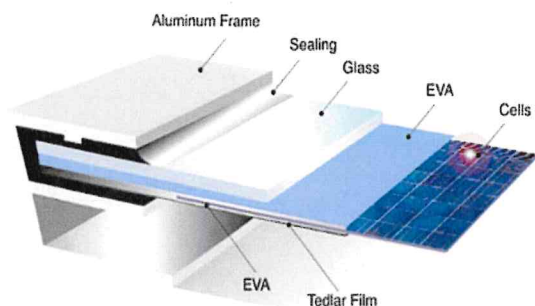


Figure 2: Components of crystalline silicon panels. The vast majority of silicon panels consist of a glass sheet on the topside with an aluminum frame providing structural support. Image Source: www.riteksolar.com.tw

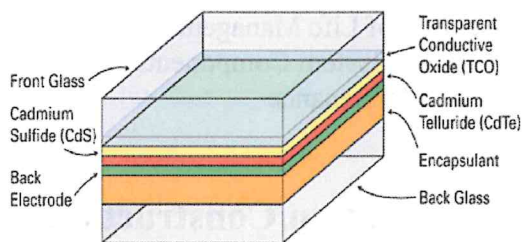


Figure 3: Layers of a common frameless thin-film panel (CdTe). Many thin film panels are frameless, including the most common thin-film panels, First Solar's CdTe. Frameless panels have protective glass on both the front and back of the panel. Layer thicknesses not to scale. Image Source: www.homepower.com

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 industry-standard 25-year power production warranty for PV panels. These power warranties warrant a PV panel to produce at least 80% of their original nameplate production after 25 years of use. A recent SolarCity and DNV GL study reported that today's quality PV panels should be expected to reliably and efficiently produce power for thirty-five years.⁴

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

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

reasons, adequate insurance coverage is also generally a requirement of the bank or firm providing financing for the project.

1.2.2 Photovoltaic (PV) Technologies

a. Crystalline Silicon

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

The other minor components of the PV cell are also generally benign; however, some contain lead, which is a human toxicant that is particularly harmful to young children. The minor components include an extremely thin antireflective coating (silicon nitride or titanium dioxide), a thin layer of aluminum on the rear, and thin strips of silver alloy that are screen-printed on the front and rear of cell.⁷ In order for the front and rear electrodes to make effective electrical contact with the proper layer of the PV cell, other materials (called glass frit) are mixed with the silver alloy and then heated to etch the metals into the cell. This glass frit historically contains a small amount of lead (Pb) in the form of lead oxide. The 60 or 72 PV cells in a PV panel are connected by soldering thin solder-covered copper tabs from the back of one cell to the front of the next cell. Traditionally a tin-based solder containing some lead (Pb) is used, but some manufacturers have switched to lead-free solder. The glass frit and/or the solder may contain trace amounts of other metals, potentially including some with human toxicity such as cadmium. However, testing to simulate the potential for leaching from broken panels, which is discussed in more detail below, did not find a potential toxicity threat from these trace elements. Therefore, the tiny amount of lead in the glass 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 lead-based 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/panel¹², 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 MW_{AC}, which is generally 7 MW_{DC}) 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 as 1998³¹) 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, cost-effectively 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 though 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 non-toxic 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 μ T, 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-and-view 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.

¹ Wiser, Ryan, Trieu Mai, Dev Millstein, Jordan Macknick, Alberta Carpenter, Stuart Cohen, Wesley Cole, Bethany Frew, and Garvin A. Heath. 2016. *On the Path to SunShot: The Environmental and Public Health Benefits of Achieving High Penetrations of Solar Energy in the United States*. Golden, CO: National Renewable Energy Laboratory. Accessed March 2017, www.nrel.gov/docs/fy16osti/65628.pdf

² IRENA and IEA-PVPS (2016), "End-of-Life Management: Solar Photovoltaic Panels," International Renewable Energy Agency and International Energy Agency Photovoltaic Power Systems.

³ National Renewable Energy Laboratory, *Overview of Field Experience – Degradation Rates & Lifetimes*. September 14, 2015. Solar Power International Conference. Accessed March 2017, www.nrel.gov/docs/fy15osti/65040.pdf

⁴ Miesel et al. *SolarCity Photovoltaic Modules with 35 Year Useful Life*. June 2016. Accessed March 2017.

<http://www.solarcity.com/newsroom/reports/solarcity-photovoltaic-modules-35-year-useful-life>

⁵ David Unger. *Are Renewables Stormproof? Hurricane Sandy Tests Solar, Wind*. November 2012. Accessed March 2017. <http://www.csmonitor.com/Environment/Energy-Voices/2012/1119/Are-renewables-stormproof-Hurricane-Sandy-tests-solar-wind> & <http://www.csmonitor.com/Environment/Energy-Voices/2012/1119/Are-renewables-stormproof-Hurricane-Sandy-tests-solar-wind>

⁶ NEXTracker and 365 Pronto, *Tracking Your Solar Investment: Best Practices for Solar Tracker O&M*. Accessed March 2017. www.nextracker.com/content/uploads/2017/03/NEXTracker_OandM-WhitePaper_FINAL_March-2017.pdf

⁷ Christiana Honsberg, Stuart Bowden. *Overview of Screen Printed Solar Cells*. Accessed January 2017.

www.pveducation.org/pvcdrom/manufacturing/screen-printed

⁸ Silicon Valley Toxics Coalition. *2015 Solar Scorecard*. Accessed August 2016. www.solarscorecard.com/2015/2015-SVTC-Solar-Scorecard.pdf

⁹ European Commission. *Recast of Reduction of Hazardous Substances (RoHS) Directive*. September 2016. Accessed August 2016. http://ec.europa.eu/environment/waste/rohs_eee/index_en.htm

¹⁰ Official Journal of the European Union, *DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment*. June 2011. Accessed May 2017. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011L0065&from=en>

¹¹ Giancarlo Giacchetta, Mariella Leporini, Barbara Marchetti. *Evaluation of the Environmental Benefits of New High Value Process for the Management of the End of Life of Thin Film Photovoltaic Modules*. July 2013. Accessed August 2016. www.researchgate.net/publication/257408804_Evaluation_of_the_environmental_benefits_of_new_high_value_process_for_the_management_of_the_end_of_life_of_thin_film_photovoltaic_modules

- ¹² European Commission. *Study on Photovoltaic Panels Supplementing The Impact Assessment for a Recast of the Weee Directive*. April 2011. Accessed August 2016.
<http://ec.europa.eu/environment/waste/weee/pdf/Study%20on%20PVs%20Bio%20final.pdf>
- ¹⁴ The amount of lead in a typical car battery is 21.4 pounds. Waste 360. Chaz Miller. *Lead Acid Batteries*. March 2006. Accessed August 2016. http://waste360.com/mag/waste_leadacid_batteries_3
- ¹⁵ Okkenhaug G. *Leaching from CdTe PV module material results from batch, column and availability tests*. Norwegian Geotechnical Institute, NGI report No. 20092155-00-6-R; 2010
- ¹⁶ International Journal of Advanced Applied Physics Research. Renate Zapf-Gottwick1, et al. *Leaching Hazardous Substances out of Photovoltaic Modules*. January 2015. Accessed January 2016.
www.cosmoscholars.com/phms/index.php/ijaapr/article/download/485/298
- ¹⁷ *ibid*
- ¹⁸ Parikhith Sinha, et al. Evaluation of Potential Health and Environmental Impacts from End-Of-Life Disposal of Photovoltaics, Photovoltaics, 2014. Accessed May 2016
- ¹⁹ Bonnet, D. and P. Meyers. 1998. *Cadmium-telluride—Material for thin film solar cells*. J. Mater. Res., Vol. 13, No. 10, pp. 2740-2753
- ²⁰ V. Fthenakis, K. Zweibel. *CdTe PV: Real and Perceived EHS Risks*. National Center of Photovoltaics and Solar Program Review Meeting, March 24-26, 2003. www.nrel.gov/docs/fy03osti/33561.pdf. Accessed May 2017
- ²¹ International Energy Agency Photovoltaic Power Systems Programme. *Life Cycle Inventories and Life Cycle Assessments of Photovoltaic Systems*. March 2015. Accessed August 2016. <http://iea-pvps.org/index.php?id=315>
- ²² Data not available on fraction of various generation sources offset by solar generation in NC, but this is believed to be a reasonable rough estimate. The SunShot report entitled The Environmental and Public Health Benefits of Achieving High Penetrations of Solar Energy in the United States analysis contributes significant (% not provided) offsetting of coal-fired generation by solar PV energy in the southeast.
- ²³ $7 \text{ MW}_{\text{DC}} * 1.5 \text{ GWh/MW}_{\text{DC}} * 25 \text{ years} * 0.93 \text{ degradation factor} * (0.1 * 4.65 \text{ grams/GWh} + 0.9 * 0.2 \text{ grams/GWh})$
- ²⁴ Vasilis Fthenakis. *CdTe PV: Facts and Handy Comparisons*. January 2003. Accessed March 2017.
https://www.bnl.gov/pv/files/pdf/art_165.pdf
- ²⁵ Kaczmar, S., *Evaluating the Read-Across Approach on CdTe Toxicity for CdTe Photovoltaics*, SETAC North America 32nd Annual Meeting, Boston, MA, November 2011. Available at: <ftp://ftp.co.imperial.ca.us/icpds/eir/campo-verde-solar/final/evaluating-toxicity.pdf>, Accessed May 2017
- ²⁷ V. M. Fthenakis et al, *Emissions and Encapsulation of Cadmium in CdTe PV Modules During Fires* Renewable Progress in Photovoltaics: Research and Application: Res. Appl. 2005; 13:1–11, Accessed March 2017,
www.bnl.gov/pv/files/pdf/abs_179.pdf
- ²⁸ Fthenakis V.M., *Life Cycle Impact Analysis of Cadmium in CdTe Photovoltaic Production*, Renewable and Sustainable Energy Reviews, 8, 303-334, 2004.
www.clca.columbia.edu/papers/Life_Cycle_Impact_Analysis_Cadmium_CdTe_Photovoltaic_production.pdf, Accessed May 2017
- ²⁹ International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels*. June 2016. Accessed November 2016.
- ³⁰ International Journal of Advanced Applied Physics Research. Renate Zapf-Gottwick1, et al. *Leaching Hazardous Substances out of Photovoltaic Modules*. January 2015. Accessed January 2016.
www.cosmoscholars.com/phms/index.php/ijaapr/article/download/485/298
- ³¹ Cunningham D., Discussion about TCLP protocols, Photovoltaics and the Environment Workshop, July 23-24, 1998, Brookhaven National Laboratory, BNL-52557
- ³² Parikhith Sinha, et al. Evaluation of Potential Health and Environmental Impacts from End-Of-Life Disposal of Photovoltaics, Photovoltaics, 2014. Accessed May 2016
- ³³ Practical Handbook of Photovoltaics: Fundamentals and Applications. T. Markvart and L. Castaner. *Chapter VII-2: Overview of Potential Hazards*. December 2003. Accessed August 2016. https://www.bnl.gov/pv/files/pdf/art_170.pdf
- ³⁴ Norwegian Geotechnical Institute. *Environmental Risks Regarding the Use and End-of-Life Disposal of CdTe PV Modules*. April 2010. Accessed August 2016. <https://www.dtsc.ca.gov/LawsRegsPolicies/upload/Norwegian-Geotechnical-Institute-Study.pdf>
- ³⁵ First Solar. Dr. Yasunari Matsuno. December 2013. August 2016. *Environmental Risk Assessment of CdTe PV Systems to be considered under Catastrophic Events in Japan*. http://www.firstsolar.com/-/media/Documents/Sustainability/Peer-Reviews/Japan_Peer-Review_Matsuno_CdTe-PV-Tsunami.ashx
- ³⁶ First Solar. Parikhith Sinha, Andreas Wade. *Assessment of Leaching Tests for Evaluating Potential Environmental Impacts of PV Module Field Breakage*. 2015 IEEE
- ³⁷ See p. 22 of First Solar, Sustainability Report. Available at: www.firstsolar.com/-/media/First-Solar/Sustainability-Documents/03801_FirstSolar_SustainabilityReport_08MAR16_Web.ashx, Accessed May 2017

- ³⁸ 40 CFR §261.24. *Toxicity Characteristic*. May 2017. Accessed May 2017. https://www.ecfr.gov/cgi-bin/text-idx?node=se40.26.261_124&rgn=div8
- ³⁹ Office of Energy Efficiency & Renewable Energy. *Copper Indium Gallium Diselenide*. Accessed March 2017. <https://www.energy.gov/eere/sunshot/copper-indium-gallium-diselenide>
- ⁴⁰ Mathias Maehlum. *Best Thin Film Solar Panels – Amorphous, Cadmium Telluride or CIGS?* April 2015. Accessed March 2017. <http://energyinformative.org/best-thin-film-solar-panels-amorphous-cadmium-telluride-cigs/>
- ⁴¹ RoHS tested certificate for Solar Frontier PV modules. TUV Rheinland, signed 11.11.2013
- ⁴² International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels*. June 2016. Accessed November 2016. http://www.irena.org/DocumentDownloads/Publications/IRENA_IEAPVPS_End-of-Life_Solar_PV_Panels_2016.pdf
- ⁴³ 40 C.F.R. §261.10. *Identifying the Characteristics of Hazardous Waste and for Listing Hazardous Waste*. November 2016. Accessed November 2016 <http://www.ecfr.gov/cgi-bin/text-idx?SID=ce0006d66da40146b490084ca2816143&mc=true&node=pt40.26.261&rgn=div5#sp40.28.261.b>
- ⁴⁴ 40 C.F.R. §261.24 *Toxicity Characteristic*. November 2016. Accessed November 2016. http://www.ecfr.gov/cgi-bin/text-idx?SID=ce0006d66da40146b490084ca2816143&mc=true&node=pt40.26.261&rgn=div5#se40.28.261_124
- ⁴⁵ International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels*. June 2016. Accessed November 2016. http://www.irena.org/DocumentDownloads/Publications/IRENA_IEAPVPS_End-of-Life_Solar_PV_Panels_2016.pdf
- ⁴⁶ TLCP test results from third-party laboratories for REC, Jinko, and Canadian Solar silicon-based panels. Provided by PV panel manufacturers directly or indirectly to authors
- ⁴⁷ Sinovoltaics, *Introduction to Solar Panel Recycling*, March 2014. Accessed October 2016. <http://sinovoltaics.com/solar-basics/introduction-to-solar-panel-recycling/>
- ⁴⁸ Brookhaven National Laboratory. Vasilis Fthenakis, *Regulations on Photovoltaic Module Disposal and Recycling*. January 29, 2001.
- ⁴⁹ Parikhit Sinha, et al. Evaluation of Potential Health and Environmental Impacts from End-Of-Life Disposal of Photovoltaics, Photovoltaics, 2014.
- ⁵⁰ First Solar. Parikhit Sinha, Andreas Wade. *Assessment of Leaching Tests for Evaluating Potential Environmental Impacts of PV Module Field Breakage*. October 2015. Accessed August 2016. <http://www.firstsolar.com/-/media/Documents/Sustainability/PVSC42-Manuscript-20150912--Assessment-of-Leaching-Tests-for-Evaluating-Potential-Environmental-Impa.ashx>
- ⁵¹ First Solar. Dr. Yasunari Matsuno. December 2013. *Environmental Risk Assessment of CdTe PV Systems to be considered under Catastrophic Events in Japan*. http://www.firstsolar.com/-/media/Documents/Sustainability/Peer-Reviews/Japan_Peer-Review_Matsuno_CdTe-PV-Tsunami.ashx
- ⁵² Phone interview, February 3, 2016, TT&E Iron & Metal, Garner, NC www.ncscrapmetal.com/
- ⁵³ Wen-His Huang, et al. *Strategy and Technology To Recycle Water-silicon Solar Modules*. Solar Energy, Volume 144, March 2017, Pages 22-31
- ⁵⁴ International Renewable Energy Agency. Stephanie Weckend, Andreas Wade, Garvin Heath. *End of Life Management: Solar Photovoltaic Panels*. June 2016. Accessed November 2016. http://www.irena.org/DocumentDownloads/Publications/IRENA_IEAPVPS_End-of-Life_Solar_PV_Panels_2016.pdf
- ⁵⁵ Official Journal of the European Union. *Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on Waste Electrical and Electronic Equipment*. July 2012. Accessed November 2016. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0019>
- ⁵⁶ PV CYCLE. *Annual Report 2015*. Accessed November 2016. <https://pvcyclepublications.cld.bz/Annual-Report-PV-CYCLE-2015/6-7>
- ⁵⁷ Official Journal of the European Union. *Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on Waste Electrical and Electronic Equipment*. July 2012. Accessed November 2016. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0019>
- ⁵⁸ SEIA National PV Recycling Program: www.seia.org/seia-national-pv-recycling-program
- ⁵⁹ RBI Solar, Decommissioning Plan submitted to Catawba County associated with permitting of a 5MW solar project in June 2016. Accessed April 2017. www.catawbacountync.gov/Planning/Projects/Rezoning/RZ2015-05_DecommissioningPlan.pdf
- ⁶⁰ Birdseye Renewables, Decommissioning Plan submitted to Catawba County associated with permitting of a 5MW solar project in May 2015. Accessed April 2017. www.catawbacountync.gov/Planning/Projects/Rezoning/RZ2015-04_DecommissioningPlan.pdf
- ⁶¹ Cypress Creek Renewables, Decommissioning Plan submitted to Catawba County associated with permitting of a 5MW solar project in September 2016. Accessed April 2017. www.catawbacountync.gov/Planning/Projects/Rezoning/RZ2016-06decommission.pdf
- ⁶² Sun Raised Farms: <http://sunraisedfarms.com/index.html>
- ⁶³ National Institute of Environmental Health Sciences and National Institutes of Health, EMF: Electric and Magnetic Fields Associated with Electric Power: Questions and Answers, June 2002

- ⁶⁴ World Health Organization. *Electromagnetic Fields and Public Health: Exposure to Extremely Low Frequency Fields*. June 2007. Accessed August 2016. <http://www.who.int/peh-emf/publications/facts/fs322/en/>
- ⁶⁵ Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems, National Research Council, Possible Health Effects of Exposure to Residential Electric and Magnetic Fields, ISBN: 0-309-55671-6, 384 pages, 6 x 9, (1997) This PDF is available from the National Academies Press at: <http://www.nap.edu/catalog/5155.html>
- ⁶⁶ World Health Organization. *Electromagnetic Fields and Public Health: Exposure to Extremely Low Frequency Fields*. June 2007. Accessed August 2016. <http://www.who.int/peh-emf/publications/facts/fs322/en/>
- ⁶⁷ World Health Organization. *Electromagnetic Fields and Public Health: Static Electric and Magnetic Fields*. March 2006. Accessed August 2016. <http://www.who.int/peh-emf/publications/facts/fs299/en/>
- ⁶⁸ Asher Sheppard, Health Issues Related to the Static and Power-Frequency Electric and Magnetic Fields (EMFs) of the Soitec Solar Energy Farms, April 30, 2014. Accessed March 2017: www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/Soitec-Documents/Final-EIR-Files/Appendix_9.0-1_EMF.pdf
- ⁶⁹ Massachusetts Clean Energy Center. *Study of Acoustic and EMF Levels from Solar Photovoltaic Projects*. December 2012. Accessed August 2016.
- ⁷⁰ Duke Energy Corporation. *Frequently Asked Questions: Electric and Magnetic Fields*. Accessed August 2016. https://www.duke-energy.com/about-energy/frequently_asked_questions.asp
- ⁷¹ National Institute of Environmental Health Sciences, *Electric and Magnetic Fields Associate with the use of Electric Power: Questions and Answers*, 2002. Accessed November 2016 www.niehs.nih.gov/health/materials/electric_and_magnetic_fields
- ⁷² Duke Energy Corporation. *Frequently Asked Questions: Electric and Magnetic Fields*. Accessed August 2016. https://www.duke-energy.com/about-energy/frequently_asked_questions.asp
- ⁷³ R.A. Tell et al, *Electromagnetic Fields Associated with Commercial Solar Photovoltaic Electric Power Generating Facilities*, Journal of Occupational and Environmental Hygiene, Volume 12, 2015,- Issue 11. Abstract Accessed March 2016: <http://www.tandfonline.com/doi/full/10.1080/15459624.2015.1047021>
- ⁷⁴ Massachusetts Department of Energy Resources, Massachusetts Department of Environmental Protection, and Massachusetts Clean Energy Center. *Questions & Answers: Ground-Mounted Solar Photovoltaic Systems*. June 2015. Accessed August 2016. <http://www.mass.gov/eea/docs/doer/renewables/solar/solar-pv-guide.pdf>
- ⁷⁵ Ibid.
- ⁷⁶ Ibid.
- ⁷⁷ *EMFs and medical devices*, Accessed March 2017. www.emfs.info/effects/medical-devices/
- ⁷⁸ Ibid.
- ⁷⁹ Damon McCluer. *Electrical Construction & Maintenance: NFPA 70E's Approach to Considering DC Hazards*. September 2013. Accessed October 2016. <http://ecmweb.com/safety/nfpa-70e-s-approach-considering-dc-hazards>,
- ⁸⁰ Hong-Yun Yang, et. al. *Experimental Studies on the Flammability and Fire Hazards of Photovoltaic Modules, Materials*. July 2015. Accessed August 2016. <http://www.mdpi.com/1996-1944/8/7/4210/pdf>
- ⁸¹ Matt Fountain. The Tribune. *Fire breaks out at Topaz Solar Farm*. July 2015. Accessed August 2016. www.sanluisobispo.com/news/local/article39055539.html
- ⁸² Cooperative Research Network. Matthew Paiss. *Tech Surveillance: PV Safety & Code Developments*. October 2014. Accessed August 2016. http://www.nreca.coop/wp-content/uploads/2013/06/ts_pv_fire_safety_oct_2014.pdf

Published by the N.C. Clean Energy Technology Center at N.C. State University



Exhibit S
Decommissioning Plan

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit T
Emergency Response Plan



Mackinaw Solar– Preliminary Emergency Response Plan

August 17, 2026

Prepared for:
Stanci March
Mackinaw Solar LLC
c/o Doral Renewables LLC
2 Logan Square
Philadelphia, PA
19103

Prepared by:
Zachary Baker, CEM, PMP
Stantec Consulting Services, Inc.
350 North Orleans Street, Suite 8000N
Chicago, IL 60654

Disclaimer

The conclusions in the Report titled Emergency Response Plan are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific Project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the Project, or for any other Project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Mackinaw Solar LLC (Mackinaw Solar or the Client), an affiliate of Doral Renewables LLC (Doral) and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the Project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Prepared by:

Signature

Zachary Baker, CEM®, PMP
Project Manager

Reviewed by:

Signature

Tony Parker, PMP
Project Manager

Approved by:

Signature

Elizabeth Corrigan, PMP, LEED AP
Team Lead

Table of Contents

1	Introduction	1
1.1	Purpose	1
1.2	Site Information	1
1.3	Plan Review and Revision	2
1.4	Emergency Agency Coordination	2
2	Emergency Contacts	3
3	Site Access	3
4	System Overview	4
4.1	Potential Hazards & Failure Modes	4
4.2	Electrical Hazards	5
4.3	Fire Incidents.....	5
	4.3.1 Vegetation	5
	4.3.2 Electrical Equipment	5
	4.3.3 Substation	6
4.4	Human Caused Incidents.....	6
5	Hazardous Materials	6
5.1	Hazardous Materials and Spill Prevention, Control and Countermeasures Plan	7
6	Emergency Response Procedures.....	7
6.1	Emergency Shutdown and Isolation	8
6.2	Remote Site Monitoring.....	8
6.3	Site Evaluation	8
	6.3.1 Site Assessment and Notification	8
	6.3.2 Site Evacuation for Potential Evacuation	9
	6.3.3 Emergency Communication Strategies.....	9
6.4	Severe Weather Response	9
6.5	Post-Incident Cleanup.....	10
6.6	Medical Emergency.....	10
7	Communication, Training and Exercise	10
7.1	Communication	10
7.2	Training	10
7.3	Exercise	12

List of Tables

Table 1. Internal Emergency Contacts.....	3
Table 2. External Emergency Contacts.	3

List of Appendices

Appendix A Figures/Maps

- A.1 Project Location
- A.2 Facility Layout Map
- A.3 Emergency Response Access Map
- A.4 Hospital Map

Appendix B Emergency Response Agency Acknowledgement

Appendix C Hazardous Material Inventory and SDS

Appendix D Emergency Shutdown and Isolation Procedures

Appendix E Emergency Response Plan Affidavit

1 Introduction

The Following Document is intended to provide a Preliminary Emergency Response Plan (ERP) for Mackinaw Solar Project (Mackinaw Solar). It will be updated once the final engineering design for the Project has been completed. The ERP will also be periodically updated throughout the life of the Project to maintain the most up to date information regarding site safety concerns and emergency response.

1.1 Purpose

The purpose of this Emergency Response Plan (ERP) is to provide employees, visitors, contractors, and first responders with general awareness of the associated risks, hazards, and general emergency response techniques related to the photovoltaic facility during construction and its operations period. The ERP shall be used as a guideline for Tazewell County, Spring Lake Township, Cincinnati Township's emergency services to agree on a planned response to emergency situations as they may occur on site from time to time during the normal course of operation. This ERP is intended to support coordination between Mackinaw Solar and emergency response agencies having jurisdiction over the Project Area and to establish a framework for safely responding to emergency situations that may occur at the facility.

This ERP provides emergency contact information and outlines procedures to mitigate and effectively respond to an emergency should one arise at the Mackinaw Solar facility. The ERP also identifies site access information, emergency notification procedures, potential hazards, evacuation procedures, training requirements, and emergency response measures intended to aid facility personnel and emergency responders during emergency incidents. Copies of this ERP will be provided to emergency response agencies having jurisdiction over the Project Area and will be updated as necessary to reflect changes in facility design, operation, emergency contacts, or response procedures.

This ERP is a guide to further develop onsite training and operation of the Project. The success of all emergency plans depends upon effective training, compliance with applicable laws, codes, and regulations, continual (e.g., annual) review of this ERP, and execution of the response. This ERP also serves as a foundation for employee training, emergency responder coordination, emergency exercises, and ongoing emergency preparedness activities throughout the life of this project.

1.2 Site Information

Mackinaw Solar is a proposed 500-megawatt alternating current (MW_{AC}) nameplate capacity solar energy generating facility in the Townships of Spring Lake and Cincinnati, Tazewell County, Illinois (see Appendix A.1). The target AC system size at the Point of Interconnection (POI) is 5000 MW at an existing substation with an interconnect voltage of 345 kV.

The Mackinaw Solar generation will be placed on approximately 3,800 acres (Project Area) of private land. Project components approximately 600,000 photovoltaic (PV) solar modules mounted on single axis tracking systems supported by steel piles, inverter and transformer stations that convert electricity from direct current (DC) to alternating current (AC), an existing 345-kV substation and associated overhead

Preliminary Emergency Response Plan

1 Introduction

transmission facilities, underground electrical collection cabling and conduits, perimeter fencing, site access roads, internal access roads, and other ancillary facilities necessary to support Project operations. Emergency infrastructure associated with the Project includes controlled access gates, emergency responder access locations, remote monitoring and communication systems, and other safety features intended to facilitate emergency response activities. The Project is anticipated to begin construction in 2027 and commence commercial operations during 2029. The anticipated lifespan of the Project is 30 years.

The main access route to the Project will be State Highway 29. Secondary access to Project facilities will be via county and local roadways. Figures depicting the primary and secondary access roads and the preliminary layout for the Project Area are included in Appendix A. Emergency responder access routes, emergency gate locations, and designated responder access points are shown in Appendix A.3 and will be updated as necessary following final design.

The Project will maintain an assigned 911 address in accordance with Tazewell County

1.3 Plan Review and Revision

The current facility layout is included in Appendix A. This layout is preliminary and will be updated when the final design is complete or at any point when the facility design changes.

A review of this emergency response plan shall be conducted and documented at minimum on an annual basis. The plan shall also be reviewed and amended whenever there is a change to the facility layout, construction, operation, or maintenance that affects emergency response planning. When outside resources are changed or modified the plan shall be reviewed and updated to reflect the changes that may affect this plan.

Updated versions of this ERP shall be distributed to emergency response agencies having jurisdiction whenever significant changes are made to emergency response procedures, site access, hazardous materials inventories, emergency contacts, emergency shutdown procedures, or facility layouts. Documentation of ERP updates and distribution shall be maintained by the Facility Owner.

1.4 Emergency Agency Coordination

Mackinaw Solar has coordinated development of this ERP with emergency response agencies serving the Project Area, including fire protection personnel, emergency medical services, law enforcement agencies, and emergency management personnel. Documentation of agency reviews, comments, training requests, and ERP acknowledgements shall be maintained by the Facility Owner. These items are tracked in Appendix B.

2 Emergency Contacts

Table 1. Internal Emergency Contacts.

Title	Name/Company	Phone
Safety Manager	[Insert Name]	[Insert Phone]
O&M Site Manager	[Insert Name]	[Insert Phone]
Project Manager	[Insert Name]	[Insert Phone]
Construction Manager	[Insert Name]	[Insert Phone]
24-Hour Emergency Contact	[Insert Name]	[Insert Phone]
Remote Monitoring Center	[Insert Name]	[Insert Phone]

Table 2. External Emergency Contacts.

Contacts	Phone Number
Tazewell County 9-1-1 (TC3)	911
City of Cincinnati Fire Protection District Fire Non-Emergency Line:	309-348-3579
Tazewell County Non-Emergency Dispatch Center	309-346-4141
Tazewell County Emergency Management Agency	309-952-2271
Carle Health Pekin Hospital– Pekin City	309-347-1151
Tazewell County Hazardous Materials Emergency	309-925-2271
Tazewell County Sheriff's Department	309-477-2250

Emergency contact information shall be kept current and distributed to emergency response agencies having jurisdiction over the Project Area whenever updated.

3 Site Access

Mackinaw Project Area will be surrounded by a perimeter fence with controlled points of ingress and egress to the Project. Designated points of ingress and egress will occur at secured access gates which are identified on the site map in Appendix A-2. The location of these access points will be updated as necessary after final design and engineering are complete.

The site's interior access roads will be maintained to provide accessibility to the site by operators and emergency personnel, even during inclement weather. The Contractor or the operations team will be responsible for maintenance and housekeeping activities during construction and operation. The 911 address of the facility is unknown at this time. Once an address is determined during final design, this ERP will be updated.

Preliminary Emergency Response Plan

4 System Overview

Each access point will include an emergency Knox box as approved and coordinated by Mackinaw Solar with local emergency response agencies that need access to the Project. Each emergency response agencies will be provided with the most recent version of this ERP and its supporting materials with full details.

Each Project gate shall display the Project name, emergency contact information, gate identification number, and applicable hazard signage. Gate numbering shall correspond to emergency response maps provided to emergency responders.

If perimeter fencing, access controls, gates, or other security measures are damaged or compromised, temporary security measures shall be implemented until permanent repairs are completed. Such measures may include temporary fencing, controlled access, site security personnel, or other appropriate access controls. Any temporary measures will be communicated to local emergency response agencies to ensure awareness.

4 System Overview

Mackinaw Solar will have a maximum generating capacity for the photovoltaic system of up to 500 megawatts, alternating current (MW_{AC}) nameplate capacity. The AC current will be routed to the 345 kV existing substation through an overhead transmission line.

4.1 Potential Hazards & Failure Modes

Potential hazards that can occur while working on a solar facility deal with electricity and fires associated with the electrical equipment or vegetation. Vegetation, like grass or brush around the facility, can catch on fire due to results of electrical failure or other external influences.

Additional hazards may include severe weather events such as tornadoes, lightning, flooding, hail, high wind events, snow and ice conditions, extreme temperatures, unauthorized access, vandalism, theft, vehicle collisions, and other human caused incidents that may affect facility operations or emergency response activities.

Other hazards more specific to electrical equipment including but not limited to substation equipment are electrical shock and arc flash. When dealing with substation equipment, the personnel shall wear proper personal protective equipment (PPE) which shall be noted on the equipment's associated Arc Flash Labels. Only qualified and authorized electrical personnel shall work on substation equipment.

Emergency responders should maintain appropriate standoff distances from energized electrical equipment and coordinate with qualified facility personnel whenever practicable prior to entering areas containing energized equipment. Emergency shutdown and isolation procedures applicable to major electrical equipment are described in Section 6.0 of this ERP.

4.2 Electrical Hazards

The following items are potential electrical hazards to consider at the Project Area or near the Project Area where the overhead transmission line ties into the Project Substation.

- Electrical equipment, including but not limited to overhead transmission lines, inverters, substation transformers, etc., is always energized and shall be treated as such.
- DC Voltage is always present around solar PV arrays.
- No trench or excavation work shall be completed within the facility without coordination with the Safety Manager as there are numerous buried electrical collection systems below grade.

Final design will incorporate all national and manufacturer electrical safety measures.

4.3 Fire Incidents

The following are the different types of fires that may occur at the Project Area with specific information regarding fire response depending on the fire type. The several types of fires described below are vegetation, electrical equipment, and substation fires. The Project will work with local emergency response organizations to determine the most effective response for a fire emergency. The Safety Manager / Remote Monitoring / Contractor or local passerby will use 911 as the immediate first call.

4.3.1 Vegetation

Vegetation will be maintained within the perimeter fence, around the electrical equipment and beneath the solar arrays tracking system. Vegetation is considered combustible. If a fire initiates from nearby or on site, the flying embers could initiate a vegetation fire. The fire would be low in intensity but could be fast moving. The fire would most likely be a relatively short-duration fire as the vegetation would be rapidly consumed.

It is recommended to take a defensive approach to prevent fire from spreading beyond the Project Area. To reduce the risk of a fire, it is recommended that vegetation be maintained at a short height by mowing or grazing the vegetation. Vegetation can also be maintained with herbicide application as an additional step. Mackinaw Solar will follow the vegetation management plan that was provided in the Special Use Permit application.

In the event of a vegetation fire, it is recommended that emergency first responders should respond to the location and based on their established procedures evaluate the fire incident to determine the correct action. Details of this response will continue to be added as the Project and local first responders further develop this plan.

4.3.2 Electrical Equipment

When electrical equipment, including but is not limited to solar arrays, inverters, combiner boxes, transformers, etc., suffers a failure (i.e., electrical shock, overheating or arc flash). This could result in an equipment fire.

Preliminary Emergency Response Plan

5 Hazardous Materials

In the event a piece of electrical equipment catches fire, the on-scene incident commander and/or County Emergency Management Director shall make the decision of how to respond to the emergency incident. Water shall not be sprayed on burning electrical equipment but can be used to cool adjacent areas near the burning equipment to prevent fire from spreading. The equipment is already burning and will need to be replaced, so the equipment shall be left to self-consume to reduce the risk to personnel. However, the on-scene incident commander shall make the final decision as to the correct measures to be undertaken to extinguish an electrical equipment fire. Mackinaw Solar will include electrical equipment fire safety manuals as an Appendix to this ERP when final equipment selection is completed at final design.

To help improve the ability to evaluate and access electrical equipment during a fire incident, should the need arise, the internal site access routes are designed to be 20 feet wide to accommodate emergency vehicle accessibility. This is in accordance with Tazewell County which adopted the 2018 International Fire Code (IFC). In the 2018 IFC section 503.2.1, fire apparatus access roads shall have an unobstructed width of not less than 20 feet, exclusive of shoulders.

4.3.3 Substation

In the event of a fire at the Project substation, the on-scene incident commander and/or County Emergency Management Director shall make the decision of how to respond to the emergency incident. Emergency first responders may choose to follow the current version of protocols they would typically use to respond to calls from utility substations. Emergency first responders may respond to the location and not enter based on their evaluation of the event, and work to prevent fire from spreading beyond the Project area. Details of this response will continue to be added as the Project and local first responders further develop this plan. Mackinaw Solar will include substation specific equipment fire safety manuals as an Appendix to this ERP when final equipment selection is completed at final design.

4.4 Human Caused Incidents

Potential human-caused incidents may include vandalism, theft, unauthorized access, vehicle collisions, intentional damage to Project components, or other security-related incidents. Any unauthorized activity shall immediately be reported to law enforcement and the Facility Manager. Project personnel shall avoid disturbing potential evidence until law enforcement personnel provide direction.

5 Hazardous Materials

If hazardous materials are on site, procedures will be outlined regarding management of containers with hazardous materials, best practices in safely handling these materials, secondary containment of materials, and marking/labeling materials based on their specific Safety Data Sheets (SDS) and manufacturer specifications.

Preliminary Emergency Response Plan

6 Emergency Response Procedures

A current inventory of hazardous materials maintained onsite shall be updated periodically and maintained as part of the Project's emergency response documentation.

Current SDS for hazardous materials and applicable equipment shall be maintained onsite and incorporated into an appendix to this ERP as they become available. SDS documentation will be updated periodically and made available to emergency responders upon request.

5.1 Hazardous Materials and Spill Prevention, Control and Countermeasures Plan

Mackinaw Solar will require that a Spill Prevention, Control, and Countermeasures (SPCC) Plan be provided by the awarded contractor for the Project. The SPCC Plan will outline the procedures and preventative measures that will be followed throughout the construction period.

Project personnel, the main construction contractor, and any other personnel on site will be required to comply with the plan. At a minimum, the SPCC Plan will identify the following:

- Typical fuels, chemicals, lubricants, and paints to be used or stored in the Project Area.
 - Potential hazardous chemicals may include diesel fuel, gasoline, fuel, oil, grease, spray paint, and galvanized paint.
- Methods and location of storage.
- Locations designated for lubrication and refueling (i.e., outside of sensitive resource areas)
- Preventative measures are to be used to minimize potential impacts.
- Mitigation methods to be employed should a spill occur.
- Location of construction spill kits (gloves, booms, sorbents, barrier materials, etc.)
- Emergency notification procedures and forms.
- Contact information for individuals requiring notification if a spill should occur.

6 Emergency Response Procedures

All Project personnel entering the Mackinaw Solar site are to be trained and knowledgeable in emergency response protocol. No employee is required or permitted to place himself or herself in danger of harm in order to facilitate extinguishment, evacuation or rescue. All rescue operations will be performed by trained professionals.

There are no municipal hydrants located in this area. Water for firefighting operations will come from a combination of fire department apparatus from the fire departments and mutual aid partners capable of carrying water to the incident scene. Local fire department knowledge of the area will also be utilized for securing a fill site to sustain water supply if needed.

Water should be used to protect adjacent exposures, such as homes, forested areas, and adjacent equipment, as needed, to limit the potential of the fire spreading.

6.1 Emergency Shutdown and Isolation

The project includes remote and local isolation capabilities that may be utilized during emergency events. Emergency shutdown and isolation procedures shall only be performed by qualified personnel. Emergency responders should coordinate with Project personnel whenever practicable prior to entering areas containing energized electrical equipment. Equipment-specific shutdown procedures and emergency disconnect locations shall be included following final equipment selection and design.

6.2 Remote Site Monitoring

Mackinaw Solar will be monitored remotely 24 hours per day, 7 days per week via the Project's SCADA system. This system constantly monitors energy output and performance at the Project and can help identify any potential issues at the Project Area before they become an emergency. If abnormalities in Project function are detected, the Project can dispatch personnel to the site for investigation and to determine the type of needed response, if any. A remote operations center is staffed 24/7, and the personnel in this operations center can remotely isolate the Project or portions of the Project from the grid if issues are detected.

Mackinaw Solar will have full-time staff on site operating the facility's day-to-day operations. The staff members will be notified immediately of any inconsistencies with the facility operations from the remote operations center. Any deviation of concern, the facility's on-site staff will notify emergency personnel immediately.

6.3 Site Evaluation

In the event that an emergency situation is identified, either through control panel notification, visual identification, or remote monitoring, the following general emergency response measures shall be initiated.

6.3.1 Site Assessment and Notification

If a threat or potential threat to life or safety is identified, the following steps shall be taken:

1. Call 911 immediately to summon the aid of public safety responders.
2. Assess the situation to determine potential safety concerns to life and the environment, with life safety as the priority.
3. Notify the Safety Manager (see Table 1) of the identified emergency situation.
4. The Safety Manager will also notify emergency services directly (see Table 2).
 - a. It is important that the information being relayed be specific and identifies, at a minimum, the following:
 - i. Type of emergency services needed.
 - ii. Any isolation process required.
 - iii. Any site-specific considerations such as fire, heat, smoke, etc.
 - b. Direct local emergency response personnel to the site entry point(s) identified on the site plan in Appendix A-2.

6.3.2 Site Evacuation for Potential Evacuation

The following are circumstances that may cause an evacuation of site but are not limited to:

- A situation which has the capacity to threaten personnel safety.
- Advice to evacuate from another authority: e.g., Tazewell County Police or Fire Department

In the event of a Site Evacuation, the Safety Manager will:

1. Communicate to all employees and visitors that a site evacuation needs to be completed and request all people to report to the muster area for roll call. The muster area shall be noted on the site map in Appendix A-2.
2. If required, implement emergency plant shutdown procedures.
3. Perform a roll call of all people expected to be at the muster point.
 - a. Photograph and take visitor logs from the day to be used to identify persons on site.
4. Any unaccounted person shall be reported to the first responders/emergency services.
5. Request assistance for evacuation transportation if persons are injured.
 - a. *NOTE: this will normally be via 911.*
 - b. Provide details of injured people to be evacuated (number and severity of injury).
6. Communicate with emergency services as indicated in the following relevant sections.

6.3.3 Emergency Communication Strategies

In the case of an emergency, Safety Manager provides the following means of emergency communication:

- **Cellular Phones/Texting:** Staff personal cell phones will be used when available to communicate externally.
- **Two-way Radios:** These radios may be used internally and externally with onsite staff for every-day communications. These radios will be a means of communication to report any emergency service personnel onsite such as the Fire Department, County Sheriff, etc.

6.4 Severe Weather Response

Severe weather events may include tornadoes, high winds, lightning, hail, flooding, snow and ice events, and other weather-related hazards.

Upon issuance of severe weather warnings, non-essential activities shall cease, personnel shall relocate to designated shelter areas or safe locations, and personnel accountability procedures shall be started.

Following severe weather events, inspections of access roads, fencing, structures, electrical equipment, drainage systems, and emergency access routes shall be completed before normal operations resume.

6.5 Post-Incident Cleanup

Following an emergency incident, debris, damaged equipment, contaminated materials, absorbents, and other waste generated during response activities shall be managed per the Mackinaw Solar Waste Management Plan, Spill Prevention Control and Countermeasure (SPCC) Plan, and applicable regulatory requirements.

6.6 Medical Emergency

If a Mackinaw Solar staff member, contractor, or other Project Area visitor is injured, or an accident occurs on site and standard first aid measures are not enough, 911 shall be called.

The nearest medical facility to the Project Area is the Carle Health Pekin Hospital– Pekin City. A map to the medical facility from the Project Area is shown in Appendix A-4.

7 Communication, Training and Exercise

7.1 Communication

Communication notifications to the public on events that take place at the Project facility will be coordinated between Mackinaw Solar and the County Emergency Management Director. The specific notification effort on the notification radius (i.e., 1 mile) and the way the notifications will be sent out will be provided in an Appendix to this ERP once final design and coordination efforts are completed.

If an emergency incident results in impacts extending beyond the project boundaries, including smoke, debris, hazardous materials, runoff, evacuation concerns, or road closures, Mackinaw Solar shall coordinate with the Tazewell County Emergency Management Agency regarding appropriate notification to affected landowners, occupants, and the public.

7.2 Training

All employees and subcontracts working in the Project Area will receive safety training, consistent with the provisions of this ERP, before beginning work on site. All individuals on site at any time during construction or operation will receive safety training upon arrival.

Prior to construction and operation, and as requested by local emergency response agencies, Mackinaw Solar will provide training on this ERP specific to the Project Area. Project staff will also provide site tours to familiarize local emergency response agencies with the Project Area, if requested.

Training will be available to all departments who may respond to a call at the Project Area each year for the first five years of the Project's operation to account for turnover in these departments. This training will be conducted in person either on site or in an off-site meeting space and will be funded by Mackinaw Solar, LLC. After five years, the Project and emergency responders can reevaluate if additional training is

Preliminary Emergency Response Plan

7 Communication, Training and Exercise

necessary. Approval by the Local Emergency Planning Committee will not be arbitrarily or capriciously withheld.

The training will review this ERP, the site layout and information about equipment and locations of spill kits and the water source, discuss any hazards on site and where these are located, and discuss emergency response in a variety of situations including inclement and extreme weather, fire, medical emergency, and other situations relevant to the site.

Training provided to facility personnel and emergency responders may also include:

- Facility layout, major equipment identification, and system overview.
- Emergency shutdown and isolation procedures.
- Electrical hazards, arc flash awareness, and safe response zones.
- Site access routes, emergency gate identification numbers, and emergency responder access locations.
- Fire response considerations and fire suppression tactics appropriate for photovoltaic facilities.
- Hazardous materials awareness, spill response procedures, and SDS review.
- Severe weather response procedures; and
- Emergency communication and notification protocols.

The training may lead to updates to this ERP, which will be made and distributed to the Emergency Contacts listed in Section 2.

Documentation of training provided under this ERP, including attendance records, responder participation, and requested or declined training opportunities, shall be maintained by Mackinaw Solar and incorporated into the Emergency Response Plan documentation associated appendices.

After the first five years of operation, if additional training is requested due to notable updates being made to emergency response procedures or as requested by Mackinaw Solar and Local Emergency Response personnel, this effort will be agreed upon by Mackinaw Solar and the Local Emergency Response personnel.

If new technologies are introduced into the Project area, additional training may be required and will be agreed upon by Mackinaw Solar and Local Emergency Response personnel.

Training requests, acknowledgements, or declinations received from responding agencies shall be documented as part of the Project's Emergency Response Plan records and incorporated into the ERP acknowledgement process.

7.3 Exercise

The Safety Manager will conduct emergency response drills on an annual basis and coordinate with emergency response personnel, as necessary.

Exercises may include tabletop exercises, functional exercises, evacuation drills, fire response drills, spill response drills, and full-scale exercises where practical. Documentation of completed exercises shall be maintained by the Facility Owner.

Appendix A Figures/Maps

A.1 Project Location

Include:

- Regional location map
- Township boundaries
- Major roadways
- Project Boundaries
- Location of nearest FD and PD

A.2 Facility Layout Map

Includes:

- Solar Array Blocks
- Substation
- O&M Facility
- Access Roads
- Perimeter Fencing

A.3 Emergency Response Access Map

Includes:

- Primary responder access route
- Secondary responder access route
- Emergency gate locations
- Gate identification numbers (i.e., 1S (1 and South), 2 E (2 and East))
- Knox Box locations
- Muster locations
- Emergency Vehicle Staging areas

A.4 Hospital Map

Includes:

- Nearest hospital and primary and secondary route and time to get there.

Appendix B Emergency Response Agency Acknowledgement

This acknowledgement documents review of the Mackinaw Solar Facility Emergency Response Plan by emergency response agencies having jurisdiction over the Project Area and records any training requests, comments, or recommendations provided by responding agencies.

Contacts	Representative	Date Reviewed	Training Requested	Annual Training Requested
Tazewell County 9-1-1 (TC3)				
City of Cincinnati Fire Protection District Fire Non-Emergency Line:				
Tazewell County Non-Emergency Dispatch Center				
Tazewell County Emergency Management Agency				
Tazewell County Hazardous Materials Emergency				
Tazewell County Sheriff's Department				

Appendix C Hazardous Material Inventory and SDS

A current inventory of hazardous materials maintained onsite shall be reviewed periodically and updated as conditions change. Current Safety Data Sheets (SDS) shall be maintained and made available to emergency responders upon request.

Material	Location	Quantity	SDS Available

Appendix D Emergency Shutdown and Isolation Procedures

Emergency shutdown and isolation procedures shall be performed only by qualified personnel. Emergency responders should coordinate with Project personnel whenever practicable prior to entering areas containing energized electrical equipment.

Will include:

- Emergency disconnect location
- Shutdown procedure reference
- Isolation method
- Responsible personnel

Appendix E Emergency Response Plan Affidavit

Mackinaw Solar LLC certifies that this Emergency Response Plan has been developed, reviewed, and distributed in accordance with applicable Tazewell County requirements and will be maintained and updated throughout the life of the Project.

Include:

- Facility Name
- Owner
- Date
- Certification of ERP Submission
- Certification of responder coordination
- Training request documentation
- Annual update commitment

Exhibit U
Glare Study

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**

Exhibit V
Property Impact Analysis



www.cohnreznick.com

REAL ESTATE ADJACENT PROPERTY VALUE IMPACT REPORT:

**Academic and Peer Authored Property Value Impact Studies,
Research and Analysis of Existing Solar Facilities, and Market
Participant and Assessor Interviews**

Prepared For:

Stanci March
Senior Development Manager
Doral Renewables, LLC
2 Logan Square, Suite 1830
Philadelphia, Pennsylvania 19103

Submitted By:

CohnReznick Advisory LLC
Valuation Advisory Services
1 S. Wacker Drive, Suite 3550
Chicago, Illinois 60606
(312) 508-5900

Andrew R. Lines, MAI, CRE
Erin C. Bowen, MAI

March 17, 2026

LETTER OF TRANSMITTAL

March 17, 2026

Stanci March
Senior Development Manager
Doral Renewables, LLC
2 Logan Square, Suite 1830
Philadelphia, Pennsylvania 19103

SUBJECT: Property Value Impact Report
An Analysis of Existing Solar Farms

To Whom it May Concern:

CohnReznick is pleased to submit the accompanying property values impact report for proposed solar energy uses in Illinois. Per the client's request, CohnReznick researched property transactions adjacent to existing solar farms, researched and analyzed articles and other published studies, and interviewed real estate professionals and Township/County Assessors active in the market where solar farms are located, to gain an understanding of actual market transactions in the presence of solar energy uses.

The purpose of this consulting assignment is to determine whether proximity to a renewable energy use (solar farm) has an impact on adjacent property values. The intended use of our opinions and conclusions is to assist the client in addressing local concerns and to provide information that local bodies are required to consider in their evaluation of solar project use applications. We have not been asked to value any specific property, and we have not done so.

The client and intended user for the assignment is Doral Renewables, LLC. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick Advisory LLC ("CohnReznick").

This consulting assignment is intended to conform to the Uniform Standards of Professional Appraisal Practice (USPAP), the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, as well as applicable state appraisal regulations.

Based on the analysis in the accompanying report, and subject to the definitions, assumptions, and limiting conditions expressed in the report, our findings are:

FINDINGS

- I. **Academic Studies (pages 23-29):** CohnReznick reviewed and analyzed published academic studies that specifically analyzed the impact of solar facilities on nearby property values. These studies include multiple regression analyses of hundreds and thousands of sales transactions, and opinion surveys, for both residential homes and farmland properties in rural communities, the majority of the data used in various studies indicates that there is no consistent and measurable impact to surrounding property values. We note that some of these studies do show a very small impact to certain homes, in certain locations, at certain distances, but these conclusions are not necessarily indicative of future projects in other locations.

Peer Authored Studies: CohnReznick also reviewed studies prepared by other real estate valuation experts that specifically analyzed the impact of solar facilities on nearby property values. These studies found little to no measurable or consistent difference in value between the Test Area Sales and the Control Area Sales attributed to the proximity to existing solar farms and noted that solar energy uses are generally considered a compatible use.

- II. **CohnReznick Studies (pages 30-156):** Further, CohnReznick has studies in 23 states, of both residential and agricultural properties, in which we have determined that the existing solar facilities have not caused any consistent and measurable negative impact on property values.

For this Project, we have included nine of these studies which are most similar to the subject in terms of general location and size, summarized as follows:

CohnReznick - Existing Solar Farms Studied					
Solar Farm #	Solar Farm	County	State	MW AC	Acreage
1	Dunn's Bridge Solar	Jasper & Starke	IN	700.00	5,000
2	Assembly Solar	Shiawassee	MI	239.00	1,900
3	DTE Lapeer	LaPeer	MI	48.28	365.0
4	Riverstart Solar	Randolph	IN	200.00	1,400
5	Hillcrest Solar	Brown	OH	200.00	1,940
6	North Star	Chisago	MN	100.00	1,000
7	Wapello Solar	Louisa	IA	100.00	800
8	Turkey Creek Solar	Garrard	KY	50.00	753
9	Grand Ridge Solar	LaSalle	IL	20.00	158

It is noted that proximity to the solar farms has not deterred sales of nearby agricultural land and residential single-family homes, nor has it deterred the development of new single-family homes on adjacent land.

This report also includes four "Before and After" analyses, in which sales that occurred prior to the announcement and construction of the solar farm project were compared with sales that occurred after completion of the solar farm project, for both adjoining and non-adjoining properties. No measurable impact on property values was demonstrated.

- III. Market Participant Commentary (*pages 157-160*): Our conclusions also consider interviews with over 75 County and Township Assessors, who have at least one solar farm in their jurisdiction, and in which they have determined that solar farms have not negatively affected adjacent property values.

With regards to the Project, we specifically interviewed the following in Illinois:

CohnReznick - Assessor Quotes						
State	County	Assessor	Assessor Quote	Solar Projects in Jurisdiction	Date Solar Project Completed	Contact Date
IL	White	Rachel Hamblin	"We have not observed any trends to indicate an impact to property values due to their proximity to solar facilities. Additionally, we have not received any property assessment appeals due to proximity to the solar farms."	149 MW Big River Solar	Aug-22	Aug-25
				150 MW Boomtown Renewable Energy Center	Dec-24	
IL	LaSalle	Viki Crouch	"There has been no impact on property values due to their proximity to the Grand Ridge Solar Farm."	20 MW Grand Ridge Solar Farm	Jul-12	Aug-20
IL	McLean	Shaun Harner	"There have been no modifications to the assessment process of homes in close proximity to solar facilities and they have not noticed any differences in sale price trends."	0.2 MW Heartland CC Project	Jan-24	Aug-25
				2.0 MW Moraine CSG	Sep-21	
				2.0 MW Breezewood Solar Project	Sep-24	
				5.0 MW Towanda Solar Project	Dec-25	
IL	Will	Iris Shaw	"Will County has not changed the assessment methodology for homes adjacent to existing solar projects and no one has filed for reductions in assessed values due to being near solar facilities."	21 Community-Scale Facilities	Dec-17 to Dec-25	Aug-25
IL	Christian	Chad Coady	"We have seen no trends that indicate solar facilities have an impact on property values due to proximity in Christian County."	1.5 MW GSI Group Solar Farm	Jan-21	Sep-25
				5.0 MW Skyline Solar Project	Nov-24	
				1.1 MW SAE Taylorville Solar Farm	May-25	
IL	Stephenson	Angie Dieterman	"There has been no impact on property values due to their proximity to any of the solar farms."	100 MW High Point Solar	Nov-23	Feb-23
				23 Community-Scale Facilities	Dec-20 to Nov-25	
IL	Fayette	Cindi Lotz	"The Dressor Plains Solar Project has not had an impact on property values or caused an increase in property assessment appeals due to proximity to the solar farm."	99 MW Dressor Plains Solar	Sep-21	Jul-23
				1.8 MW Conagra Foods Solar	Jan-21	
IL	Ogle	Tricia Black	"We have not seen any trends that solar projects are impacting property values or increasing requests for assessment reductions."	6 Community-Scale Facilities	Nov-14 to Nov-25	Sep-25
IL	Coles	Michelle Babbs	"We have not reduced assessed values for homes proximate to the Prairie Wolf Solar Project as there has been no sale transactions to warrant doing so."	200 MW Prairie Wolf Solar	Nov-25	Feb-26

To give us additional insight as to how the market evaluates farmland and single-family homes with views of solar farms, we interviewed numerous real estate brokers and other market participants who were party to actual sales of property adjacent to solar; these professionals also confirmed that solar farms did not diminish property values or marketability in the areas they conducted their business.

- IV. Solar Farm Factors on Harmony of Use (*pages 161-169*): In the course of our research and studies, we have recorded information regarding the compatibility of these existing solar facilities and their adjoining uses, including the continuing development of land adjoining these facilities.

CONCLUSION

Considering all of the preceding, the data indicates that solar facilities do not have a negative impact on adjacent property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Very truly yours,

CohnReznick Advisory LLC



Andrew R. Lines, MAI, CRE
Principal
Certified General Real Estate Appraiser
Illinois License No. 553.001841
Expires 9/30/2027
New York License No. 46000051059
Expires 6/16/2026
Michigan License No. 1205078298
Expires 7/31/2026



Erin C. Bowen, MAI
Director
Certified General Real Estate Appraiser
Arizona License No. 32052
Expires 12/31/2026
Oregon License No. C001551
Expires 6/30/2026
Iowa License No. CG04209
Expires 6/30/2026

TABLE OF CONTENTS

LETTER OF TRANSMITTAL	2
FINDINGS	3
CONCLUSION	5
SCOPE OF WORK	7
OVERVIEW OF SOLAR DEVELOPMENT IN THE UNITED STATES.....	9
FEDERAL POLICY	10
ECONOMIC IMPACT	11
NATIONAL UTILITY-SCALE ENERGY PRODUCTION	12
ENERGY PRODUCTION IN ILLINOIS	16
APPRAISAL THEORY – ADJACENT PROPERTY’S IMPACT ON VALUE	19
METHODOLOGY	20
SCOPE OF WORK.....	21
TECHNIQUE 1: REVIEW OF PUBLISHED STUDIES	23
ACADEMIC REPORTS	23
VALUATION EXPERT REPORTS	28
REAL ESTATE ASSESSOR SOLAR IMPACT REPORTS	28
CONCLUSION	29
TECHNIQUE 2: PAIRED SALE ANALYSIS	30
SOLAR FARM 1: DUNN’S BRIDGE I & II SOLAR FARM, JASPER & STARKE COUNTIES, IN	30
SOLAR FARM 2: ASSEMBLY SOLAR FARM, SHIAWASSEE COUNTY, MI	42
SOLAR FARM 3: DTE’S LAPEER SOLAR PROJECT, LAPEER, MICHIGAN	64
SOLAR FARM 4: RIVERSTART SOLAR FARM, RANDOLPH COUNTY, IN	77
SOLAR FARM 5: HILLCREST SOLAR FARM, BROWN COUNTY, OH	90
SOLAR FARM 6: NORTH STAR SOLAR FARM, CHISAGO COUNTY, MINNESOTA	110
SOLAR FARM 7: WAPELLO SOLAR FARM, LOUISA COUNTY, IA	133
SOLAR FARM 8: TURKEY CREEK SOLAR FARM, GARRARD COUNTY, KENTUCKY	140
SOLAR FARM 9: GRAND RIDGE SOLAR FARM, LASALLE COUNTY, ILLINOIS	152
TECHNIQUE 3: MARKET COMMENTARY	157
SOLAR FARM FACTORS ON HARMONY OF USE	161
SUMMARY OF ADJOINING USES	169
SUMMARY AND FINAL CONCLUSIONS	170
CERTIFICATION	173
ASSUMPTIONS AND LIMITING CONDITIONS	175
ADDENDUM A: APPRAISER QUALIFICATIONS	179

SCOPE OF WORK

CLIENT AND INTENDED USERS

The client and intended user of this report is Doral Renewables, LLC.

INTENDED USE

The intended use of our opinions and conclusions is to assist the client in addressing local concerns and to provide information that local bodies are required to consider in their evaluation of solar project use applications. We have not been asked to value any specific property, and we have not done so. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick Advisory LLC ("CohnReznick").

PURPOSE

The purpose of this consulting assignment is to determine whether proximity to the proposed solar facility will result in an impact on adjacent property values.

DEFINITION OF VALUE

This report utilizes Market Value as the appropriate premise of value. Market value is defined as:

"The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition are the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. Buyer and seller are typically motivated;
2. Both parties are well informed or well advised, and acting in what they consider their own best interests;
3. A reasonable time is allowed for exposure in the open market.
4. Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and
5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale."¹

¹ Code of Federal Regulations, Title 12, Chapter I, Part 34.42[h]

EFFECTIVE DATE & DATE OF REPORT

March 17, 2026 (Paired sale analyses contained within each study are periodically updated.)

PRIOR SERVICES

USPAP requires appraisers to disclose to the client any services they have provided in connection with the subject property in the prior three years, including valuation, consulting, property management, brokerage, or any other services.

This report is a compilation of the existing solar farms which we have studied over the past year and is not evaluating a specific subject site. In this instance, there is no “subject property” to disclose.

INSPECTION

Andrew R. Lines, MAI, CRE, and Erin C. Bowen, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.

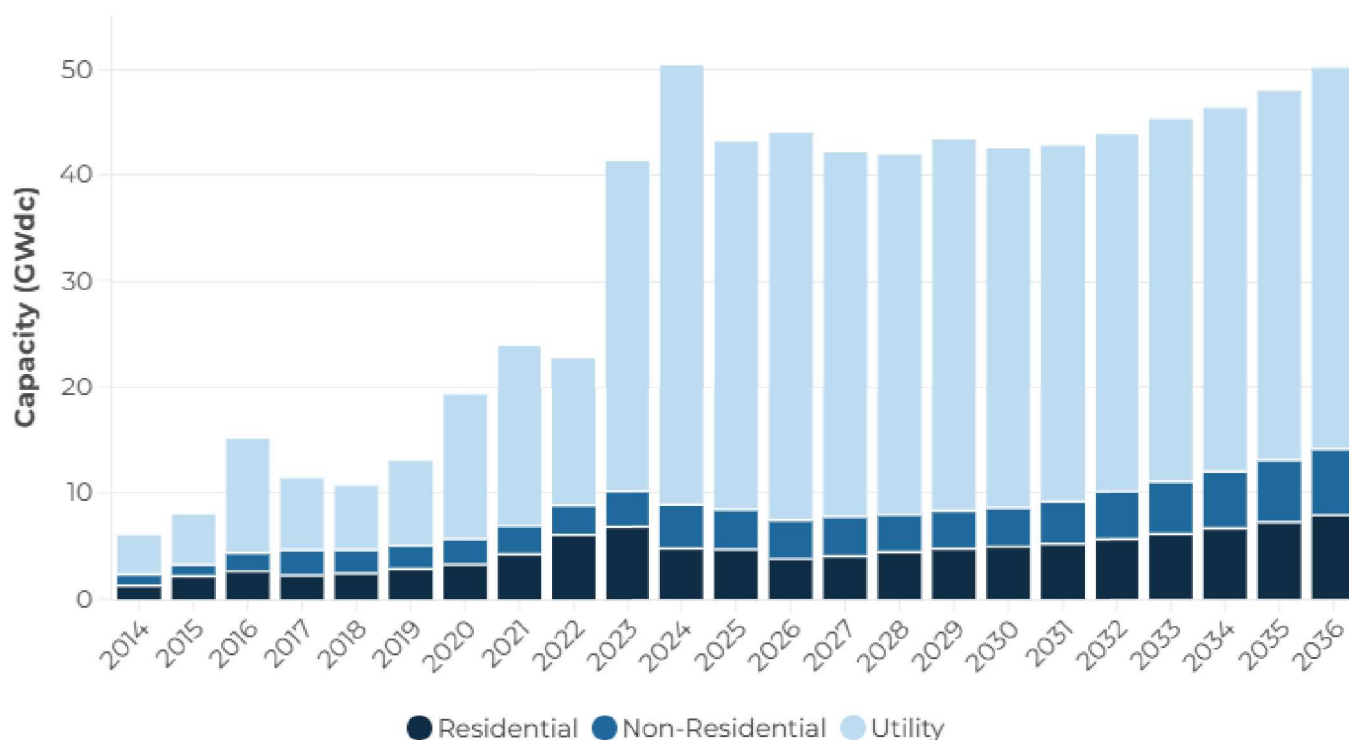
OVERVIEW OF SOLAR DEVELOPMENT IN THE UNITED STATES

The United States installed 43.2 gigawatts (GW) of new solar capacity in 2025, a decrease of 14 percent year-over-year.

According to the U.S. Solar Market Insight 2025 Year in Review report released in March 2025 by the Solar Energy Industries Association (SEIA) and Wood Mackenzie, solar and storage account for 54% of all new electricity generating capacity added to the grid in 2025.

Solar development increased almost exponentially over the past ten years in the United States as technology and the economic incentives (Solar Investment Tax Credits or ITC) made the installation of solar farms economically reasonable. The cost to install solar panels has dropped nationally by 70% since 2010, which has been one cause that led to the increase in installations. A majority of these solar farm installations are attributed to larger-scale solar farm developments for utility purposes. The chart below portrays the historical increase on an annual basis of solar installations in the US as a whole, courtesy of research by Solar Energy Industries Association (SEIA) and Wood Mackenzie, and projects solar photovoltaic (PV) deployment for the next ten years through 2036, with the largest percentage of installations attributed to utility-scale projects.

U.S. Solar PV Installations and Forecast by Segment



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight 2025 Year in Review



Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



The US solar industry installed nearly 43.2 GW of capacity in 2025, a 14% increase from 2024. The distributed solar segments had a mixed year. Commercial solar installed 2,345 MW in 2025, growing 6% year-over-year. The community solar segment added 1,435 MW in 2025, a 25% decrease year-over-year. This decline was primarily attributed to the slowdowns in the Maine and New York community solar markets. The utility-scale segment deployed more than 34.7 GW in 2025, a 16% decline year-over-year and nearly the same amount of capacity that came online during the first three quarters of 2024. Due to the changes in tax credit deadlines, developers delayed commercial operation dates and focused on safe harboring their pipeline, resulting in fewer projects than were originally slated to come online in Q4 2025. The residential segment installed 4,647 MW in capacity in 2025, a 2% decline year-over-year.

FEDERAL POLICY

As of August 12, 2022, the Inflation Reduction Act was passed in the Senate and The House of Representatives, which included long-term solar incentives and investment in domestic solar manufacturing. Included in the bill, a 10-year extension and expansion of the Investment Tax Credit (ITC) and Production Tax Credit (PTC) will provide tax credits for solar manufacturing and direct payment options for tax credits. While the uncertainty of the anti-circumvention investigation remained present, the passage of the Inflation Reduction Act gave the solar industry long-term market certainty.

On April 22, 2024, the U.S. Environmental Protection Agency (“EPA”) announced \$7 billion in grant awards through a grant competition, Solar for All, to deliver residential solar projects to over 900,000 households nationwide. The grant competition is funded through the Inflation Reduction Act and provides funds to states, territories, Tribal governments, municipalities, and non-profits across the country to develop long-lasting solar programs. The program is expected to generate over \$350 million in annual savings on electric bills for households.

During the first weeks of the new administration a series of executive orders impacted industries including the energy sector. Several are aimed at promoting fossil fuels and rolling back climate change initiatives. The proposed measures have varying degrees of impact on each solar segment; however, the industry remains optimistic about the role of solar in achieving energy dominance and meeting rising electricity demand. State-level initiatives and corporate demand will gain more relevance and drive solar development, potentially mitigating the impact of federal mandates. Given continued AI and data center growth, combined with supply chain bottlenecks for large gas turbines, solar is expected to remain the preferred technology to meet the growing demand, even more so if paired with storage.

On July 4, 2025, the budget reconciliation bill (“Big Beautiful Bill”) was signed, which included immediate implications and introduced a mix of incentives and compliance challenges for the US solar industry. It encouraged accelerated development by allowing commercial solar projects that begin construction by July 4, 2026 to bypass a strict 2027 in-service deadline, making it easier to qualify for technology-neutral tax credits, potentially covering 30 percent to 70 percent of project costs. Projects that start construction by the end of 2025 will be shielded from new foreign entity of concern (FEOC) restrictions, which otherwise disqualify projects using excessive Chinese equipment or financing. However, the bill tightened enforcement of construction-start rules and eliminated the permanent 10 percent Investment Tax Credit (ITC), requiring developers to navigate more complex qualification criteria.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

ECONOMIC IMPACT

In response to the Big Beautiful Bill, solar developers have been advancing projects in their pipeline quickly in order to adhere to a July 4, 2026 construction start date. As of the end of Q2 2025, Wood Mackenzie, an energy industry data and consulting firm, is tracking 50 GW of new facilities scheduled to begin construction by the end of 2025, with another 40 GW positioned to do so in the first half of 2026.

Over the course of our five-year outlook, the US solar industry is expected to nearly triple in size. Between 2025 and 2030, the industry will add approximately 50 GWdc annually increasing capacity by nearly 250 GWdc by 2030.² Solar will be the leading technology of the clean energy transition, however, the Big Beautiful Bill has added uncertainty to the industry which is still sorting out the implications of new FEOC restrictions and tax credit deadlines.

Wood Mackenzie expects the introduction of FEOC restrictions to prompt a shift towards domestic supply chains but risks short-term bottlenecks and higher costs if the U.S. manufacturing capacity cannot scale quickly enough. Given increasing costs from tariffs and higher labor and utility costs for U.S. manufacturers, tax credits are critical for their profitability and many manufacturers will have to consider their viability if they no longer qualify for tax credits.

Despite the uncertainty in the solar market, near-term demand remains strong due to a constrained power supply and the increased cost of new gas production, offsetting some of the impacts of the Big Beautiful Bill. In the long term, demand for new energy supply and rising power prices strengthen market fundamentals for new solar projects.

Solar farms offer a wide array of economic and environmental benefits to surrounding properties. Unlike other energy sources, solar energy does not produce emissions that may cause negative health effects or environmental damage. Solar farms produce a lower electromagnetic field exposure than most household appliances, such as TV and refrigerators, and studies have confirmed there are no health issues related to solar farms.³

Solar farm construction in rural areas has also dramatically increased the tax value of the land on which they are built, which has provided a financial boost to some counties. CohnReznick has studied real estate tax increases due to the installation of solar, which can range up to 10-12 times the rate for farmland. A majority of tax revenue is funneled back into the local area, and as much as 50 percent of increased tax revenue can typically be allocated to the local school district. By converting farmland to a passive solar use for the duration of the system's life, the solar energy use does not burden school systems, utilities, traffic, nor infrastructure as it is a passive use that does not increase population as say a residential subdivision would.

Beyond creating jobs, solar farms are also benefiting the overall long-term agricultural health of the community. The unused land, and also all the land beneath the solar panels, will be left to rejuvenate naturally. In the long run this is a better use of land since the soil is allowed to recuperate instead of being ploughed and fertilized

² <https://seia.org/research-resources/solar-market-insight-report-q4-2025/>

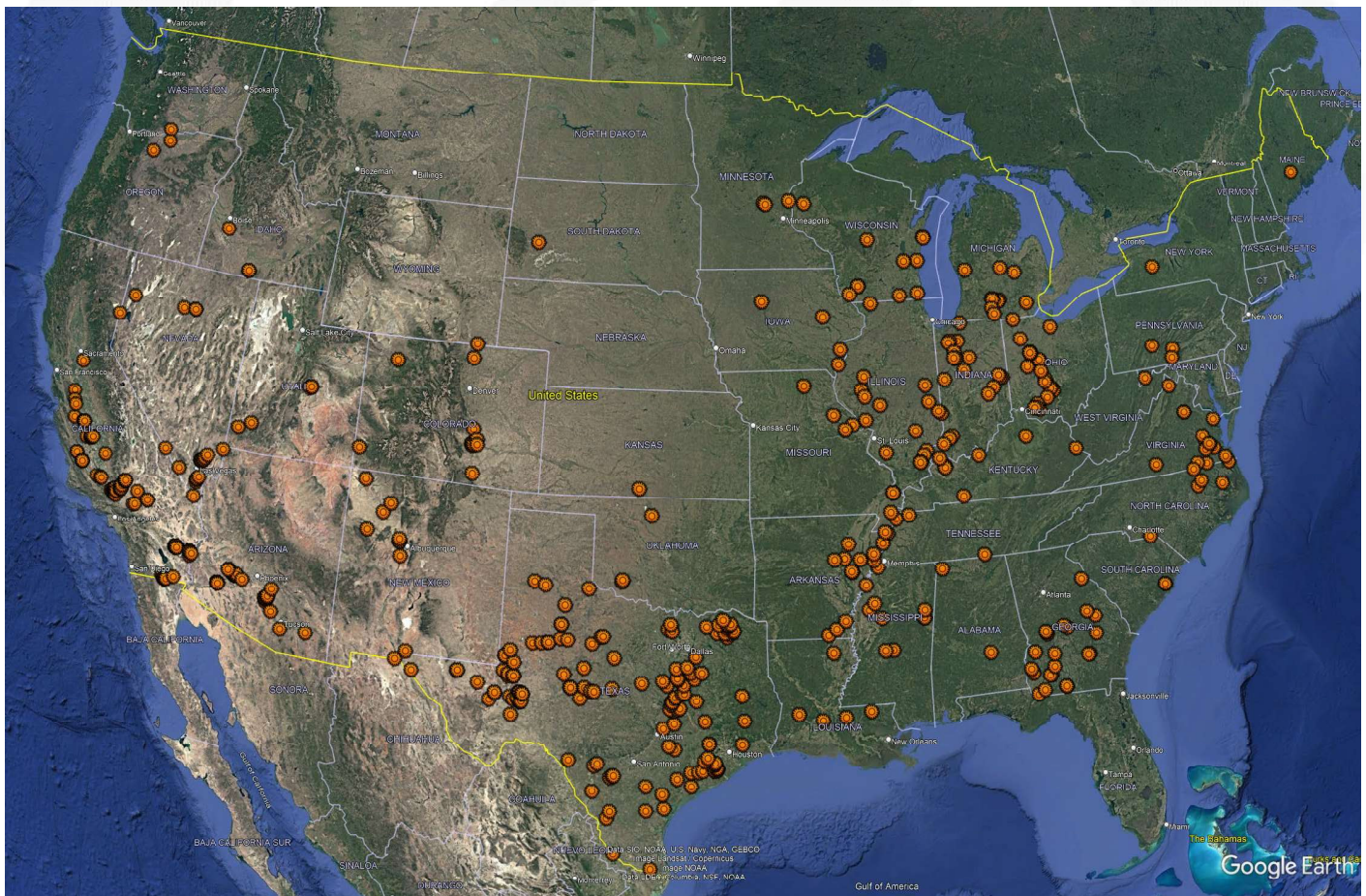
³ "Electromagnetic Field and Public Health." Media Centre (2013): 1-4. World Health Organization.

year after year. A solar farm can offer some financial security for the property owner over 20 to 25 years. Once solar panel racking systems are removed, the land can revert to its original use.⁴

NATIONAL UTILITY-SCALE ENERGY PRODUCTION

As of January 2026, the U.S. produces over 1.378 million megawatts (MW) of power each year, according to the U.S. Energy Information Administration (EIA) in $\pm 27,760$ unique power generation facilities. Of that power produced, approximately 11.1 percent is generated from solar facilities, or 153,193 MW AC, at 7,816 solar facilities across the country, reflecting an average facility size of 19.6 MW AC. For utility scale solar production, the number of facilities that generate over 5 MW of power accounts for 27 percent of all solar facilities, nationwide, whereas 91 percent of solar power generated in the country comes from utility scale facilities, overall.

According to the U.S. Energy Information Administration (EIA) through January 2026, ± 483 solar facilities are in operation that generate 100 MW AC or more of power. A map illustrating existing solar farms with capacities greater than 100 MW is presented below (indicated by orange suns), using data retrieved from the EIA.



⁴ NC State Extension. (May 2016). Landowner Solar Leasing: Contract Terms Explained. Retrieved from: <https://content.ces.ncsu.edu/landowner-solar-leasing-contract-terms-explained>

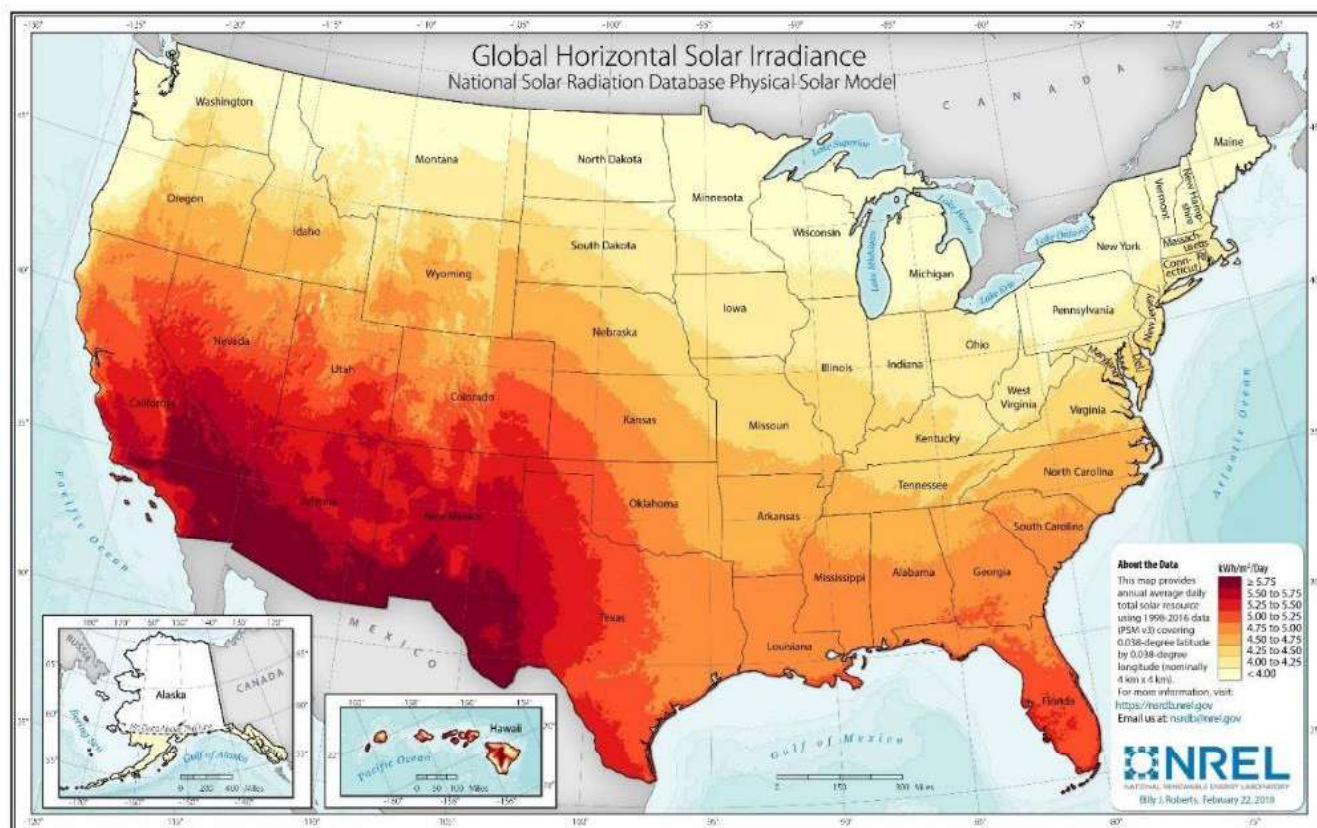
Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

To meet zoning and planning requirements, and/or to take advantage of certain incentive programs, several solar farms are built by the same developer around the same location, de facto functioning as one larger solar farm. Many of these solar facilities are located in California, with several located in Florida, Texas, Nevada, North Carolina, Arizona, Georgia, and Utah. Additionally, these installations are typically located in outlying areas where site costs are lowest, and residential development and sales activity is minimal in these areas. While we reviewed each for surrounding uses, the majority are not good candidates for a paired sales analysis since they were either recently constructed or surrounding development/sales activity was minimal.

In the United States, there are ±179 operating solar farms with generating capacities above 200 MW AC, presented on the following pages. All of the existing solar farms in operation as of January 2026 that have a generating capacity of greater than 200 MW AC are located in the southwestern United States, with the exception of 51 facilities located in Ohio, Indiana, Illinois, Wisconsin, Michigan, Minnesota, Virginia, Kentucky, Colorado, Idaho, Montana, Georgia, Alabama, Arkansas, Mississippi, and Louisiana. The following are studied in this report:

- The 200 MW Hillcrest Solar Project in Ohio;
- The 300 MW Riverstart Solar Park Project in Indiana;
- The 239 MW Assembly Solar Project in Michigan

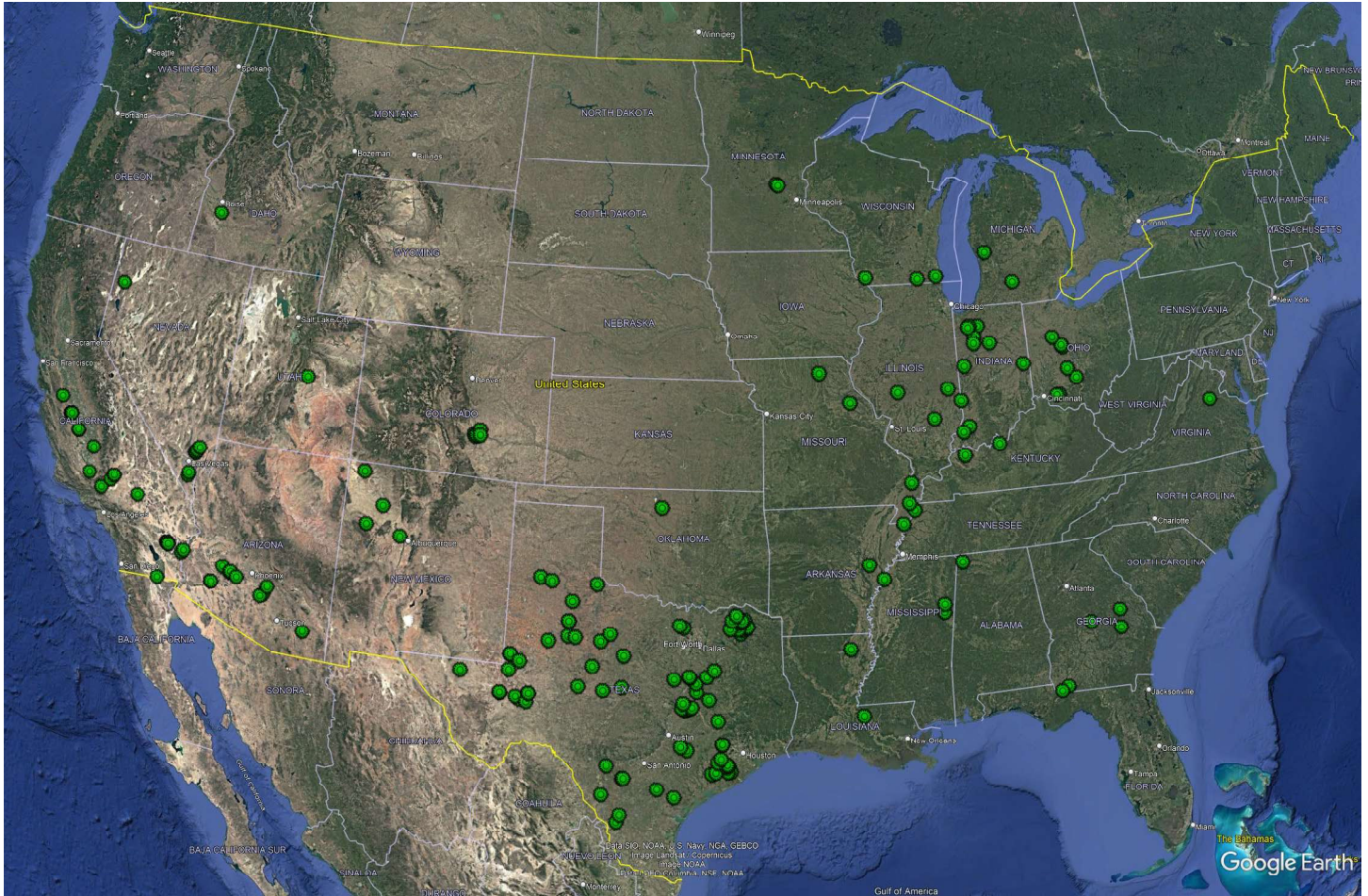
The map developed by the National Renewable Energy Laboratory (NREL), presented on the following page, shows the solar resources released by the sun daily throughout in the United States. Red indicates the areas with the most solar resources.



It should be noted that there are 232 solar projects currently planned across the United States over 200 MW. These projects are located throughout the United States, not just in the areas with solar resources, the largest of which are four 1,200 MW projects located in Georgia, Oregon, Washington, and Illinois. These include the Pepper Hammock Solar Project in Wayne County, Georgia, the Sunstone Solar Project in Morrow County, Oregon, the Hop Hill Solar Generation Project in Benton County, Washington, and the Steward Creek Solar Project in Lee County, Illinois. All four of the projects are currently awaiting regulatory approvals and are not yet under construction.

The following map has operating solar installations larger than 200 MW (marked by green suns) and shows that the largest solar installations have been built in areas where there are the most solar resources.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

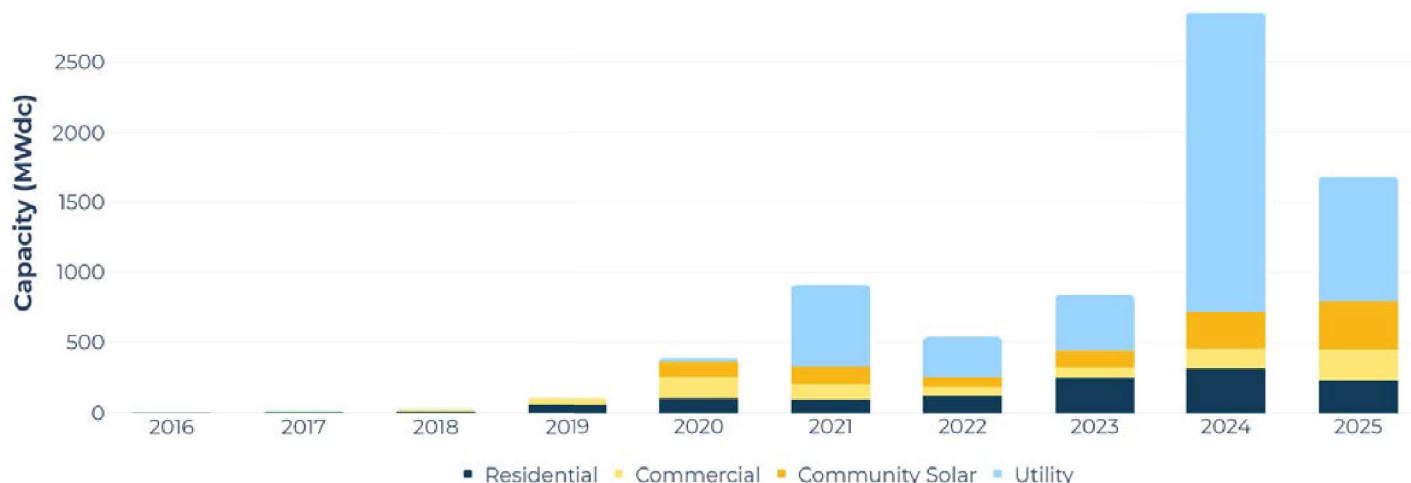


Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

ENERGY PRODUCTION IN ILLINOIS

As of the end of Q4 2025, Illinois had 7,427 MW of solar installed, ranking 10th in the US for the capacity of solar installed according to the Solar Energy Industries Association (SEIA). There have been significantly more utility investments in clean energy with continued growth on the horizon, with 11,873 MW of solar proposed to be installed over the next five years.

Illinois Annual Solar Installations



Illinois has 1,600.1 MW AC of solar power planned for installation through December 2026 in 64 facilities across the state. Of the planned solar installations in Illinois through December 2026, 15 are utility scale and total 1,449.2 MW AC, or approximately 91 percent of all planned installations. The largest new solar facility in Illinois will be a 1,200 MW AC utility scale installation projected to become operational in December 2029 in Lee County, which is being developed by Steward Creek Solar.

Illinois has 32 utility scale solar facilities in operation, one of which, the Grand Ridge Solar Farm that we have studied and have included in this report. The remaining utility scale solar facilities include:

- The 592.8 MW Double Back Diamond Solar Project, completed in November 2024;
- The 250 MW Maple Flats Solar Project, completed in November 2024;
- The 200 MW Prairie Wolf Solar Project, completed in November 2021;
- The 165.3 MW River Ferry Solar Project, completed in December 2023;
- The 150 MW Eldorado Solar I Solar Project, completed in January 2025;
- The 150 MW Boomtown Renewable Energy Center, completed in December 2024;
- The 150 MW Cass County Renewable Energy Center, completed in December 2024;
- The 150 MW Pleasantville Solar Park, completed in November 2025;
- The 150 MW Tilden Solar Project, completed in November 2025;
- The 149 MW Big River Solar Project, completed in August 2022;
- The 140 MW Wolf Run Solar Project, completed in November 2024;
- The 135 MW Prairie Solar Project, completed in January 2026;

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

- The 120 MW Eldorado Solar II Solar Project, completed in October 2025;
- The 110 MW Hickory Solar Project, completed in September 2024;
- The 100 MW High Point Solar Project, completed in November 2021;
- The 99 MW Prairie State Solar Project, completed in July 2021;
- The 99 MW Dressor Plains Solar Project, completed in September 2021;
- The 70 MW Mulligan Solar Project, completed in July 2022;
- The 68.4 MW Baldwin Solar Project, completed in December 2024;
- The 50 MW Kimmel Road Solar Project, completed in October 2024;
- The 50 MW Salt Creek Township Solar Project, completed in January 2025;
- The 44.2 MW Coffeen Solar Project, completed in December 2024;
- The 35 MW Richland Township Solar Project, completed in January 2025;
- The 35 MW Earp Solar Project, completed in April 2024;
- The 30 MW Prairie Creek Solar Project, completed in November 2023;
- The 20 MW DePue Holdings Solar Project, completed in February 2023;
- The 10.8 MW Richland Township Solar II Project, completed in September 2025;
- The 10 MW Northern Cardinal Solar Project, completed in February 2021,
- The 9.9 MW Belleville Solar Project, completed in September 2021;
- The 9.0 MW Exelon Solar Chicago Project, completed in December 2009;
- And the 7.0 MW Yeoman Creek Solar Project, completed in December 2025.

We spoke to the Supervisor of Assessments for each project to ask whether there have been any transactions or impacts on property values since the completion of the facility. Most Assessment Officers indicated that the project was so new that there was no data in which to study. Cindi Lotz of Fayette County, Illinois did indicate that the Dressor Plains Solar project “has not had any impact whatsoever” on adjacent property values. We have reviewed the areas surrounding each of these newly constructed facilities; as of the reporting date, there are not yet eligible transactions for us to develop an impact study on these projects for inclusion in our analysis.

Illinois has seen considerable growth in solar production since the first project became operational in 2009. Of the 320 existing solar projects in Illinois, 12 were completed between 2009 and 2019. A further 46 solar projects were completed in 2020 alone, followed by 68 in 2021, 13 in 2022, 14 in 2023, 67 in 2024, 97 in 2025, and 3 through January 2026. The solar projects completed in the last five years account for 80% of the total solar projects in the state. Nevertheless, we were able to study four existing solar projects in Illinois, that had transactions after the completion of the solar project, Grand Ridge Solar, included in this report, as well as Freeport Solar, IGS Stockton DG Community Solar Garden and Pretzel Community Solar Garden.

Solar accounts for only 10,732 acres in Illinois, a fraction of the 11.1 million acres used for corn production and 9.7 million acres used for soybeans. The following breaks down Illinois land usage including the projection for solar in the next five years.

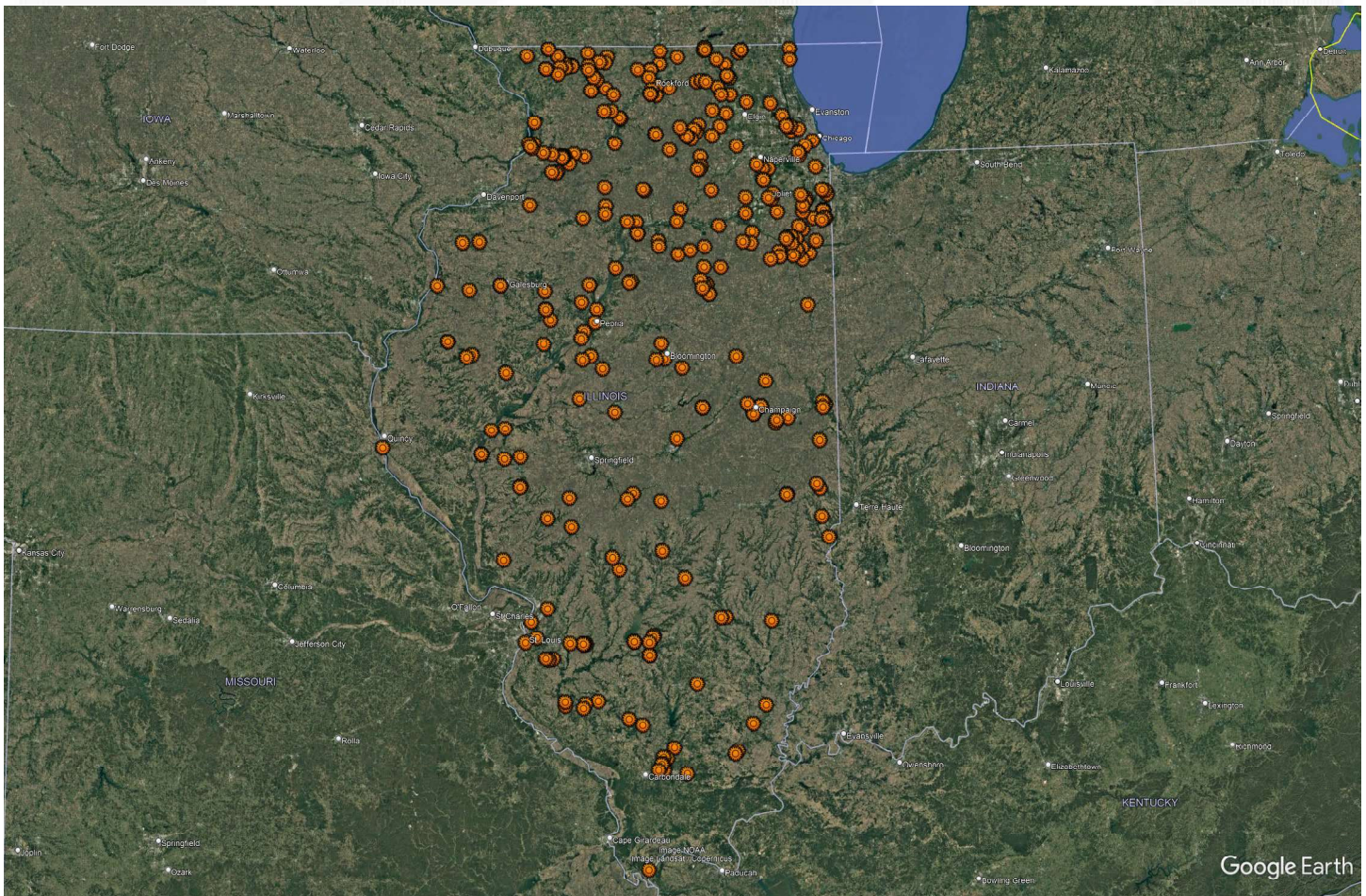
LAND USE

Illinois Land Use Comparison



Illinois is home to 5,905 solar related jobs, and 376 solar related companies, which includes 92 manufacturers, and 101 installers/developers.

A map of all operational solar facilities in State of Illinois as of January 2026 per the U.S. Energy Information Administration (“EIA”) is presented below.



Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

APPRAISAL THEORY – ADJACENT PROPERTY’S IMPACT ON VALUE

According to Randall Bell, PhD, MAI, author of text *Real Estate Damages*, published by the Appraisal Institute in 2016, understanding the market’s perceptions on all factors that may have an influence on a property’s desirability (and therefore its value) is essential in determining if a diminution or enhancement of value has occurred.⁵ According to Dr. Bell:

“There is often a predisposition to believe that detrimental conditions automatically have a negative impact on property values. However, it is important to keep in mind that if a property’s value is to be affected by a negative condition, whether internal or external to the property, that condition must be given enough weight in the decision-making process of buyers and sellers to have a material effect on pricing relative to all the other positive and negative attributes that influence the value of that particular property.”⁶

Market data and empirical research through the application of the three traditional approaches to value should be utilized to estimate the market value to determine if there is a material effect on pricing due, to the influence of a particular characteristic of or on a property.

A credible impact analysis is one that is logical, innate, testable and repeatable, prepared in conformity with approved valuation techniques. In order to produce credible assignment results, more than one valuation technique should be utilized for support for the primary method, or a check of reasonableness, such as utilization of more than one approach to value, conducting a literature review, or having discussions (testimony) with market participants.⁷ CohnReznick implemented the scientific method⁸ to determine if a detrimental condition of proximity to a solar farm exists, further described in the next section.

⁵ Bell, Randall, PhD, MAI. *Real Estate Damages*. Third ed. Chicago, IL: Appraisal Institute, 2016. (Pages 1-2)

⁶ Ibid, Page 314

⁷ Ibid, Pages 7-8

⁸ The scientific method is a process that involves observation, development of a theory, establishment of a hypothesis, and testing. The valuation process applies principles of the scientific method as a model, based upon economic principles (primarily substitution) as the hypothesis. The steps for the scientific method are outlined as follows:

1. Identify the problem.
2. Collect relevant data.
3. Propose a hypothesis.
4. Test the hypothesis.
5. Assess the validity of the hypothesis.

Bell, Randall, PhD, MAI. *Real Estate Damages*. Third ed. Chicago, IL: Appraisal Institute, 2016. (Pages 314-316)

METHODOLOGY

The purpose of this report is to determine whether proximity to the solar facility resulted in any measurable and consistent impact on adjacent property values. To test this hypothesis, CohnReznick identified three relevant techniques to test if a detrimental condition exists.

- (1) A review of published studies;
- (2) Paired sale analysis of properties adjacent to existing solar generating facilities, which may include repeat sale analyses or “Before and After” analyses; and,
- (3) Interviews with real estate professionals and local real estate assessors.

The paired sales analysis is an effective method of determining if there is a detrimental impact on surrounding properties.

*“One of the most useful applications of the sales comparison approach is paired sale analysis. This type of analysis may compare the subject property or similarly impacted properties called **Test Areas** (at Points B, C, D, E, or F) with unimpaired properties called **Control Areas** (Point A). A comparison may also be made between the unimpaired value of the subject property before and after the discovery of a detrimental condition. If a legitimate detrimental condition exists, there will likely be a measurable and consistent difference between the two sets of market data; if not, there will likely be no significant difference between the two sets of data. This process involves the study of a group of sales with a detrimental condition, which are then compared to a group of otherwise similar sales without the detrimental condition.”⁹*

As an approved method, paired sales analysis can be utilized to extract the effect of a single characteristic on value. By definition, paired data analysis is “a quantitative technique used to identify and measure adjustments to the sale prices or rents of comparable properties; to apply this technique, sales or rental data on nearly identical properties is analyzed to isolate a single characteristic’s effect on value or rent.”¹⁰ The text further describes that this method is theoretically sound when an abundance of market data, or sale transactions, is available for analysis.

Where data is available, CohnReznick has also prepared “Before and After” analyses or a Repeat Sale Analysis,¹¹ to determine if a detrimental impact has occurred.

⁹ Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Page 33)

¹⁰ *The Appraisal of Real Estate 14th Edition.* Chicago, IL: Appraisal Institute, 2013.

¹¹ Another type of paired sales analysis involves studying the sale and subsequent resale of the same property. This method is used to determine the influence of time on market values or to determine the impact of a detrimental condition by comparing values before and after the discovery of the condition.

Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Page 35)

SCOPE OF WORK

The scope of work utilized to test the hypothesis stated on the prior page is as follows:

1. Review published studies, assess credibility, and validity of conclusions;
2. Prepare paired sale analyses for existing solar farms as follows:
 - 2.1. Identify existing solar farms comparable to the proposed project to analyze;
 - 2.2. Define Test Area Sales and Control Areas Sales;
 - 2.3. Collect market data (sale transactions) for both Test Area and Control Area Sales;
 - 2.4. Analyze and confirm sales, including omission of sales that are not reflective of market value;
 - 2.5. Prepare comparative analysis of Test Area and Control Area sales, adjusting for market conditions;
 - 2.6. Interpret calculations; and
3. Conduct interviews with real estate professionals and local real estate assessors who have evaluated real property adjacent to existing solar farms.

It should be noted that our impact report data and methodology have been previously reviewed by our peer in the field – Kirkland Appraisals, LLC – as well as by the Solar Energy Industries Association (SEIA).

The following bullet points summarize important elements to consider in our scope of work:

- Test Area Sales consists of sales that are adjacent to an existing solar facility. Ownership and sales history for each adjoining property to an existing solar farm through the effective date of this report is maintained within our workfile. Adjoining properties with no sales data or that sold prior to the announcement of the solar farm were excluded from further analysis.
- Control Area Sales are generally located in the same market area, although varies based on the general location of the existing solar farm under analysis. In rural areas, sales are identified first within the township, and expands radially outward through the county until a reliable set of data points is obtained.
- Control Area Sales are generally between 12 and 18 months before or after the date of the Test Area Sale(s), and are comparable in physical characteristics such as age, condition, style, and size.
- Sales of properties that sold in a non-arm's length transaction (such as a transaction between related parties, bank-owned transaction, or between adjacent owners) were excluded from analysis as these are not considered to be reflective of market value, as defined earlier in this report. The sales that remained after exclusions were considered for a paired sale analysis.
- The methodology employed in this report for paired sale analysis does not rely on multiple subjective adjustments that are typical in many appraisals and single-paired sales analyses. Rather, the

methodology remains objective, and the only adjustment required is for market conditions:¹² the analysis relies upon market conditions trends tracked by credible agencies such as the Federal Housing Finance Agency ("FHFA"), who maintains a House Price Index ("HPI")¹³ for macro and micro regions in the United States. A market conditions adjustment is a variable that affects all properties similarly and can be adjusted for in an objective manner.

- To make direct comparisons, the sale price of the Control Area Sales was adjusted for market conditions to a common date. In this analysis, the common date is the date of the Test Area Sale(s). After adjustment, any measurable difference between the sale prices would be indicative of a possible price impact by the solar facility.
- If there is more than one Test Area Sale to evaluate, the sales are grouped if they exhibit similar transactional and physical characteristics; otherwise, they are evaluated separately with their own respective Control Area Sale groups.

¹² Adjusting for market conditions is necessary as described in The Appraisal of Real Estate 14th Edition as follows: "Comparable sales that occurred under market conditions different from those applicable to the subject on the effective date of appraisal require adjustment for any differences that affect their values. An adjustment for market conditions is made if general property values have increased or decreased since the transaction dates."

¹³ The FHFA HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or re-financings on the same properties. This information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. The FHFA HPI serves as a timely, accurate indicator of house price trends at various geographic levels. Because of the breadth of the sample, it provides more information than is available in other house price indexes.

TECHNIQUE 1: REVIEW OF PUBLISHED STUDIES

The following is a discussion of various studies that consider the impact of solar farms on surrounding property values. The studies range from quantitative analysis to survey-based formal research to less-formal analyses.

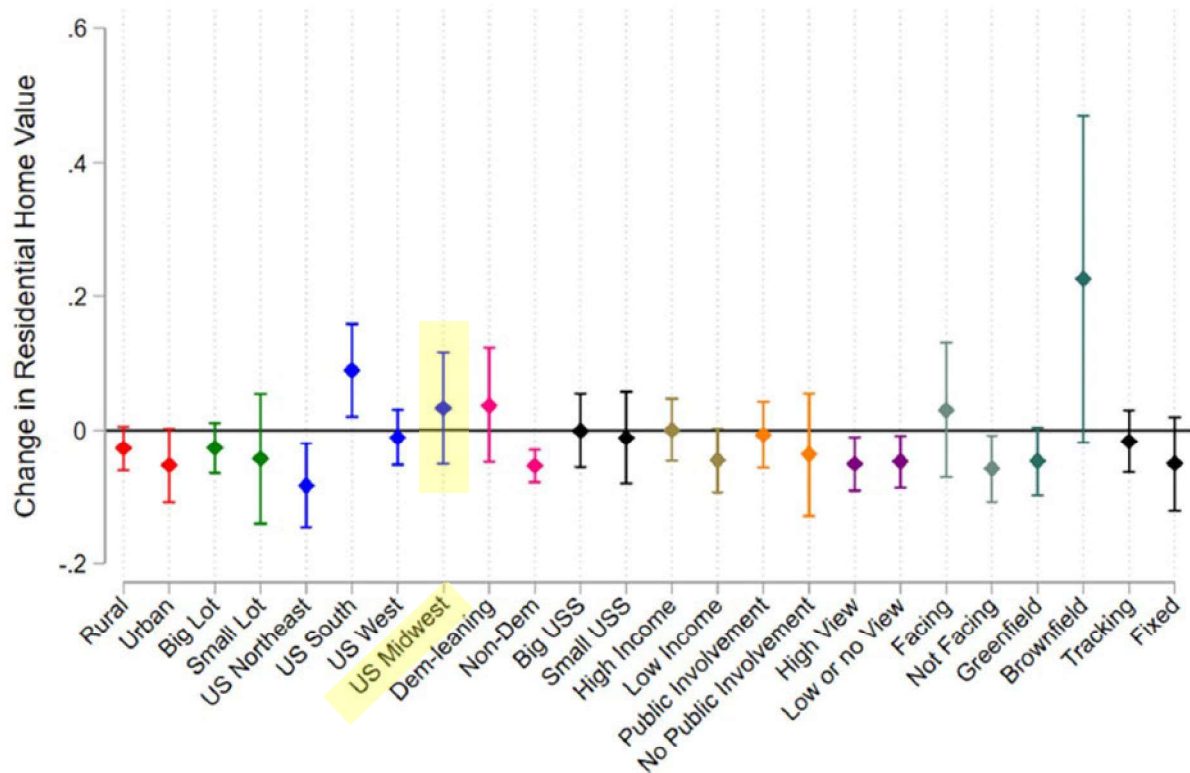
ACADEMIC REPORTS

There have been eight academic reports that attempt to quantify the effect on property values due to proximity to solar.

- i. In November 2025, an article was published in **The Appraisal Journal**, Volume 93, Issue 2, titled “Do Utility-Scale Solar Projects Affect Nearby Residential Real Estate Markets. The article, written by Erin Kiella, PhD, Jennifer Pitts, MAI and Christopher Yost-Bremm, PhD, studied three utility-scale solar projects in Texas, the 200 MW Ramble Solar project, the 160 MW Concho Valley Solar project, and the 350 MW Five Wells Solar project. The authors used transaction data from MLS to analyze median price per square foot, days on market and sale to list price ratios for homes near the solar projects and compared them to control areas of similar real estate markets. The authors concluded that “The market trend analyses of **residential homes in markets proximate to three large-scale solar projects did not provide any evidence of a negative impact on sale prices, days on market, or sale price to list price ratio.**”
- ii. In April 2025 **Virginia Tech**, published a report titled *Impact of large-scale solar on property values in the United States: Diverse effects and causal mechanisms*.¹⁴ Authored by Chenyang Hu, Zhenshan Chen, Pengfei Liu, Wei Shang, Xi He and Darrell Bosch, the study looked at 8.8 million sales and 3,699 solar sites. The study utilized difference-in-differences (DiD) models within a six-mile radius of the solar site from 15 years before the instillation through 2020. CohnReznick also notes that all transactions in the study were trended to the year 2017 for comparison, using the Consumer Price Index from the US Bureau of Labor Statistics. We note that the transactions used in the study are from 1993 to 2020, and trending data from upwards of 24 years can result in small errors magnified.

The study presented conflicting results including a positive impact to residential properties directly facing a solar site while a negative impact for residential properties not directly facing a solar site located within three miles. Additionally, **the results of the study indicated that in three of the four regions across the United States, the U.S. Midwest, U.S. South, and U.S. West indicated a positive impact (U.S. Midwest) or no impact** while only the U.S. Northeast reflected a negative impact for home sales within three miles of a solar site. The results of the study indicate that large scale solar projects increase nearby agricultural or vacant land by about 19.4 percent, no effect on large lot residential properties, and residential property values decreasing by about 4.8 percent. The study also indicates that negative residential impact fades after ninth year.

¹⁴ Chenyang Hu, et al. *Impact of large-scale solar on property values in the United States: Diverse effects and causal mechanisms*, Virginia Tech, April 2025, <https://vtechworks.lib.vt.edu/items/1077ab6a-72aa-4f7a-972a-48ce74f6af0a>.



Study Results: Impact of large-scale solar on property values in the United States: Diverse effects and causal mechanisms

- iii. In September 2024 a study prepared by Simeng Hao and Gilbert Michaud of **Loyola University Chicago's** School of Environmental Sustainability was published, "Assessing Property Value Impacts Near Utility-Scale Solar in the Midwestern United State". The study examined 70 utility-scale solar farms in the states of IL, IN, IA, KS, MI, MN, MO, NE, OH and WI, that were completed between 2009 and 2022 and measured over 20,800 average home values (AHV) from this time period. The study utilized difference-in-differences (DiD) models which compared the change in AHV for "treatment groups", zip codes which have a utility-scale solar projects, to the change in AHV for "control groups", zip codes that did not have a utility-scale solar project and were in the same state as the treatment groups. ***The results of the study indicate that utility-scale solar projects increase nearby property values by roughly 0.5-2.0 percent, with smaller projects (less than 20 MW) having more of a positive impact on nearby property values than project over 20 MW.***

The study included models with unadjusted AHV (does not account for increase in value due to market conditions) and adjusted AHV (accounted for increase in value due to market conditions by utilizing the Case Schiller Index, which is measured using data on repeated sales of single-family homes over time). Both models indicated similar results, strengthening the finding of a positive correlation between utility-scale solar projects and nearby property values.

The study further suggested, "the positive correlation between utility-scale solar projects and nearby property values could be due to the new tax revenues, which are often used to support local school and

other public services, as well as the local employment opportunities that utility-scale solar projects can provide”.

- iv. In April 2024 **Lawrence Berkeley National Lab**, published a report titled *Perceptions of Large-Scale Solar Project Neighbors: Results From a National Survey*.¹⁵ Authored by Joseph Rand, Ben Hoen, Karl Hoesch, Sarah Mills, Robi Nilson, Doug Bassette and Jack White, the report is a summation of a nearly 1,000-resident survey. An opinion survey was sent to residents living within three miles of large-scale solar (LSS), and 984 responses were collected. The survey revealed that **“among LSS neighbors, ‘positive’ attitudes outnumber ‘negative’ by nearly a 3 to 1 margin.** Looking across the full set of respondents that were aware of their local LSS project, 43% reported a ‘positive’ or ‘very positive’ attitude toward it, 42% were ‘neutral’, and 15% reported a ‘negative’ or ‘very negative’ attitude. 42% report that they would support additional LSS in their community, compared to 18% that would oppose it.” Additionally, the report noted that “Roughly 1/3 of residents living within 3 miles of LSS projects did not know their local project existed. Those living closest to projects and respondents around the largest projects in our sample (>100 MW) tended to be more familiar with them, but even some respondents living within ½ mile were unaware.”
- v. On March 1, 2023, an article was prepared by the Energy Analysis and Environmental Impacts Division, **Lawrence Berkeley National Lab**, Berkeley, CA (“BNL”), which measured 1.8 million residential transactions around solar facilities greater than 1 MW in the states of CA, CT, MA, MN, NC and NJ. This article notes that for the overwhelmingly majority of the transactions (in the states of CA, CT and MA), no impact was measured near large-scale photo-voltaic facilities or LSPV’s. The authors of the study similarly released a webinar discussing the study, as well as key limitations of the study, as follows:
 - The dataset is centered on relatively small projects in relatively urban areas... Our results should not be applied to larger projects, e.g., those >18 MW, and, of course projects built far from homes.
 - [The] study did not consider site design, setbacks or landscaping features...
 - Across the full dataset (all 6 states) only larger projects (greater than 12 acres) are correlated with a loss in house prices within 0.5 miles (compared to 2-4 miles away); BUT this analysis only applies to relatively small projects (90% are less than 35 acres/8 MW), so “large” is relative to the median of 12 acres.
 - Only 6 states are included; therefore, the results would not necessarily apply outside the sample area. Given these limitations, we do not believe the study is overwhelmingly conclusive, and, if any, only presents limited data showing a rather small impact in certain areas. The states showing no impact reflect 68.6% of all the transactions studied.

Our review of the study revealed key questions that we believe limit the applicability of the study as a whole:

¹⁵ Rand Joseph, et al. *Perceptions of Large-Scale Solar Project Neighbors: Results From a National Survey*, Energy Markets & Policy, Berkeley Lab, April 2024, [Perceptions of Large-Scale Solar Project Neighbors: Results From a National Survey | Energy Markets & Policy \(lbl.gov\)](#).

1. The study does not show the data for the largest of the solar facilities mapped and whether those reveal transactions that are consistent with the study's results (i.e., solar facilities greater than 8 MW in all six states). We would hypothesize that the largest of the facilities would show the greatest amount of impact; this is not expressed (and so likely not true). Further, our own studies of the largest facilities in Minnesota (the 100 MW North Star Solar Farm) rebut the study's results.
2. There was no effort by the authors to interpret whether other adjacent property next to solar facilities might also impact local residential values. This could include large commercial buildings, office towers, industrial developments or highways. This might have swayed the results.
3. Data results are somewhat contrary to common reason – for example, their conclusions indicate a negative impact in rural areas, insignificant impact in urban areas, but overwhelmingly positive results for "urban cluster" areas. This diverges from the theory that density and impact correlate.
4. Data results using similar methodology in the URI study reveal contrary results: while the URI study found no impact in rural communities, the BNL study indicates some very small degree of impact, and while the BNL study showed no impact in suburban areas, the URI did show a rather small impact. The results, therefore, are mixed and do not indicate consistent and measurable evidence.
5. Whether the results of -1.5% is applicable in terms of its relative degree. This is a rather small percentage and most appraisers and valuation professionals would find it difficult to profess this is of a magnitude that would be recognized in the market.

The BNL study does represent the largest study to date on the topic of solar farms and property values. We find that the majority of the data indicates no impact. The authors themselves suggest additional focus as follows: "more research is needed to understand the heterogeneity that we observe with respect to larger, agricultural and rural LSPVs [in the MN, NJ and NC contexts]. Here, surveys, qualitative research, mixed-methods, and case study-based approaches may indicate how neighbors of LSPVS engage differently with their nearby solar installations based on its size, land use, or the urbanicity of their home." CohnReznick agrees with the BNL suggestion – and covers specifically this request in our own studies within Minnesota and North Carolina, as well as several other solar farms of various sizes in various locations.

- vi. The third report published is a study prepared by Dr. Nino Abashidze, School of Economics, **Georgia Institute of Technology**, dated October 20, 2020, entitled "*Utility Scale Solar Farms and Agricultural Land Values*." Abashidze examined 451 solar farms in North Carolina. "Across many samples and specifications, we find ***no direct negative or positive spillover effect of a solar farm construction on nearby agricultural land values***. Although there are no direct effects of solar farms on nearby agricultural land values, we do find evidence that suggests construction of a solar farm may create a small, positive, option-value for landowners that is capitalized into land prices. Specifically, after construction of a nearby solar farm, we find that agricultural land that is also located near transmission infrastructure may increase modestly in value."
- vii. The second report published is a study prepared by a team at the **University of Rhode Island**, published in September 2020, "*Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and*

*Rhode Island.*¹⁶ The study utilized a hedonic pricing model, or multiple regression analysis, to quantify the effect of proximity on property values due to solar by studying existing solar installations in Massachusetts and Rhode Island. The study evaluated 208 solar facilities, 71,373 housing sales occurring within one-mile of the solar facilities (Test Group), and 343,921 sales between one-to-three miles (Control Group). Because it is a hedonic regression model, it allowed them to isolate specific variables that could impact value, including isolating rural and non-rural locations. The study defines “Rural,” as an area having a “population density of 850 people per square mile or fewer.”

The study provides data which found no negative impact to residential homes near solar arrays in rural areas: “these results suggest that [the Test Area] in rural areas **is effectively zero** (a statistically insignificant 0.1%), and that the negative externalities of solar arrays are only occurring in non-rural areas.”¹⁷ Further, the study tested to determine if the size of the installation impacted values, and found no evidence of differential property values impacts by the solar installation’s size.

Thus, not only are there no impacts to homes in similar areas as the proposed Project, but any differences in the size of a solar farm are similarly not demonstrating an impact.

- viii. The first report published is a study completed by **The University of Texas at Austin**, published in May 2018.¹⁸ The portion of the study focusing on property impact was an Opinion Survey of Assessors with no sales data or evidence included in the survey. The opinion survey was sent to 400 assessors nationwide and received only 37 responses. Of those 37 assessors, only 18 had assessed a home near a utility-scale solar installation, the remainder had not. Of the 18 assessors with experience in valuing homes near solar farms, 17 had not found any impact on home values near solar. Those are the actual facts in the study. A small number of those assessor respondents hypothetically surmised an impact, but none had evidence to support such statements.

The paper admits that there is no actual sales data analyzed, and further denotes its own areas of weakness, including “This study did not differentiate between ground-mounted and rooftop installations.” The author states on the last line of page 22: **“Finally, to shift from perceived to actual property value impacts, future research can conduct analyses on home sales data to collect empirical evidence of actual property value impacts.”**

The paper concludes with a suggestion that a statistical hedonic regression model may better identify impacts. It should be noted that the type of statistical analysis that the author states is required to

¹⁶ Gaur, V. and C. Lang. (2020). Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island. Submitted to University of Rhode Island Cooperative Extension on September 29, 2020. Accessed at <https://web.uri.edu/coopext/valuing-sitingoptions-for-commercial-scale-solar-energy-in-rhode-island/>.

¹⁷ The University of Rhode Island study’s conclusion that there may be an impact to non-rural communities is surmised is that “land is abundant in rural areas, so the development of some land into solar does little to impact scarcity, whereas in non-rural areas it makes a noticeable impact.”

¹⁸ Al-Hamoodah, Leila, et al. An Exploration of Property-Value Impacts Near Utility-Scale Solar Installations. Policy Research Project (PRP), LBJ School of Public Affairs, The University of Texas at Austin, May 2018, emp.lbj.gov/sites/default/files/property-value_impacts_near_utility-scale_solar_installations.pdf.

determine “*actual property value impacts*” was completed two years later by the following Academic Studies.

VALUATION EXPERT REPORTS

We have similarly considered property value impact studies prepared by other experts, which have also noted that the installation of utility-scale solar on a property has no measurable or consistent impact on adjoining property value. According to a report titled “Mapleton Solar Impact Study” from Kirkland Appraisals, LLC, conducted in Murfreesboro, North Carolina in September 2017, which studied 13 existing solar farms in the state, found that the solar farms had no impact on adjacent vacant residential, agricultural land, or residential homes. The paired sales data analysis in the report primarily consisted of low density residential and agricultural land uses and included one case where the solar farm adjoined to two dense subdivisions of homes.

Donald Fisher, ARA, who has served six years as Chair of the American Society of Farm Managers and Rural Appraisers, and has prepared several market studies examining the impact of solar on residential values was quoted in a press release dated February 15, 2021 stating, “Most of the locations were in either suburban or rural areas, and all of these studies found either a neutral impact or, ironically, a positive impact, where values on properties after the installation of solar farms went up higher than time trends.”

REAL ESTATE ASSESSOR SOLAR IMPACT REPORTS

The Chisago County (Minnesota) Assessor’s Office conducted their own study on property prices adjacent to and in the close vicinity of the North Star solar farm in Chisago County, Minnesota. At the November 2017 Chisago County Board meeting, John Keefe, the Chisago County Assessor, presented data from his study. He concluded that the North Star solar farm had, “no adverse impact” on property values. His study encompassed 15 parcels that sold and were adjacent or in the close vicinity to the solar farm between January 2016 and October 2017; the control group used for comparison comprised of over 700 sales within the county. Almost all of the [Test Area] properties sold were at a price above the assessed value. He further stated that, “It seems conclusive that valuation has not suffered.”¹⁹

Furthermore, Grant County, Kentucky Property Value Administrator, Elliott Anderson, stated that Duke Energy built a solar farm near Crittenden, adjacent to existing homes on Claiborne Drive in December 2017. At the time of the interview, there have been nine arm’s length homes sales on that street since the solar farm commenced operations. Each of those nine homes sold higher than its assessed value, and one over 32 percent higher. At the time, Anderson noted that several more lots were for sale by the developer and four more homes were currently under construction. Anderson said that the solar farm had no impact either on adjoining home values or on marketability or desirability of those homes adjacent to the solar farm.

¹⁹ Chisago County Press: County Board Real Estate Update Shows No “Solar Effects” (11/03/2017)

CONCLUSION

These published studies and other valuation expert opinions, conclude that there is no impact to property adjacent to established solar farms. These conclusions have been confirmed by academic studies utilizing large sales databases and regression analysis investigating this uses' potential impact on property values. Further, the conclusion has been confirmed by county assessors who have also investigated this adjacent land use' potential impact on property values.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

TECHNIQUE 2: PAIRED SALE ANALYSIS

SOLAR FARM 1: DUNN'S BRIDGE I & II SOLAR FARM, JASPER & STARKE COUNTIES, IN

Coordinates: Latitude 41.17257, Longitude -87.00726

PINs: Multiple

Total Land Size: Approximately 5,000 Acres

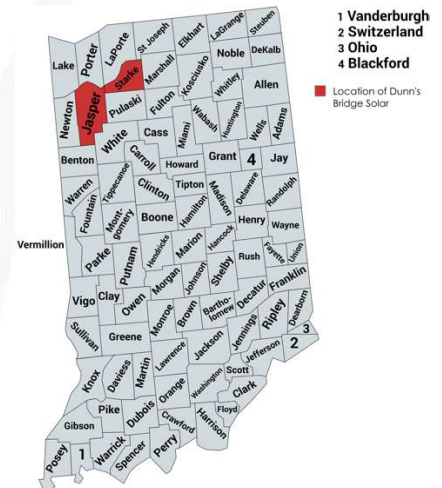
Population Density (2024): 60 people per square mile (Jasper County), 75 people per square mile (Starke County)

Date Project Announced: October 2020

Date Project Completed: Phase I, June 2023; Phase II, January 2025

Output: 700 MW AC; (Phase I: 265 MW AC, Phase II: 435 MW AC)

Date Study Completed: September 2025



Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The Dunn's Bridge Solar Farm ("Dunn's Bridge Solar" or "the Project") use is located in Jasper and Starke Counties, Indiana, in the northwestern portion of the state. The solar farm is located in between the Kankakee River to the north, State Route 49 to the west, E. 1100 North to the south, and S. 850 East to the east.

The Dunn's Bridge Solar Farm consists of two phases, with Phase I generating 265 MW and became operational in June 2023 while Phase II generates 435 MW, and included a 75 MW battery energy storage system, became operational in January 2025. The combined 700 MW solar project generates enough energy to power over 210,000 homes. The Project consists of over 2,400,000 solar panels spanning over 5,000 acres in Jasper County and Starke County, in a rural setting. The developers of the Dunn's Bridge Solar Farm, NextEra Energy Resources, entered a joint venture with the Northern Indiana Public Service Company (NIPSCO) to co-own and operate the Project. The Project is the largest utility-scale solar farm in Indiana.

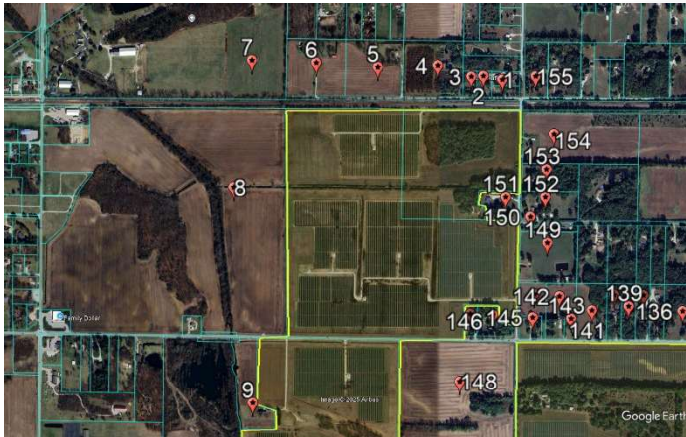
The Dunn's Bridge Solar Project is estimated to generate approximately \$59 million in additional tax revenue for Jasper and Starke Counties over the life of the Project.

The Surrounding Area: The Turkey Creek Solar installation is located on the border of Jasper County and Starke County, Indiana, immediately to the south of the Kankakee River, and approximately 30 miles south of the City of Lexington, in central Kentucky. The solar site is approximately 55 miles southeast of the City of Chicago and 50 miles southwest of the City of South Bend.

As of August 2025, the Dunn's Bridge Solar project is one of the 116 solar farms in Indiana and is one of four solar farms located within Jasper County or Starke County. The Dunn's Bridge Solar project is largest solar farm in the state, with the second largest being the Mammoth North Solar Farm in Starke County, which produces an output of 400 MW and became operational in November 2024.

The Immediate Area: The solar farm spans over 5,000 acres in Jasper and Starke Counties and is immediately surrounded by primarily rural residential properties, agricultural land, the 507-acre Prairie Border Nature preserve, and the Schafer Generating Station, which includes two coal-fired generating units that are expected to cease operation by the end of 2025 and two natural-gas powered generating units, with a small number of industrial uses interspersed throughout the surrounding Project area.

The following maps display the parcels developed with the solar farm (outlined in yellow). Properties immediately adjoining the solar parcels (red pins) are numbered for subsequent analysis.



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



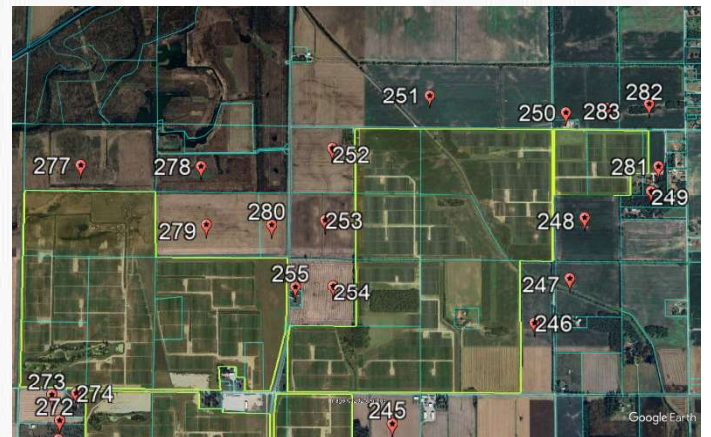
Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties



Dunn's Bridge Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

PAIRED SALES ANALYSIS

We considered only one type of paired sales analysis, which was comparing sales of properties not proximate to the solar farm (Control Area Sales) to the sales of adjoining properties after the completion of the solar farm project (Test Area Sales). We identified five adjacent properties to Phase I of the Dunn's Bridge Solar Project that have sold since it was completed in June 2023. As of September 2025, there have been no adjacent properties to Phase II of the Dunn's Bridge Solar Project that have sold since it was completed in January 2025.

We identified Control Area Sale data through the Zillow database and have verified these sales through county records and conversations with brokers and sellers. We excluded sales that were not arm's length, such as REO sales or bank-owned properties, or those between related parties.

It is important to note that the Control Area Sales are not adjoining to any solar farm, nor do they have a view of one from the property. Therefore, the announcement nor the completion of the solar farm use could have impacted the sales price of these properties.

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 110 and 126 to the Dunn's Bridge Solar Project were considered for a paired sales analysis, and we have analyzed these properties as single-family home uses in Group 1. The properties are multi-story single-family homes constructed in the early 2000's, each with garage parking and partially finished basements, on lot sizes of approximately three acres, and are both located within Jasper County. For Adjoining Property 110, the property line is approximately 135 feet from the closest solar panel, while the improvements are approximately 395 feet from the closest solar panel. For Adjoining Property 126, the property line is approximately 425 feet from the closest solar panel, while the improvements are approximately 565 feet from the closest solar panel. The following table outlines the other important characteristics of the Test Area Sales for Group 1, Adjoining Properties 110 and 126.

SUMMARY OF TEST AREA SALE Group 1 - Dunn's Bridge Solar Farm										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
110	2473 E. State Road 10, Wheatfield, IN 46392	\$440,000	4	3.0	2000	3,288	2-Story SFH with 3-Car Attached Garage, Partially Finished Basement, and Above Ground Pool	3.00	\$133.82	Mar-25
126	11598 N 200 E, Wheatfield, IN 46392	\$485,000	3	3.5	2002	2,899	1.5-Story SFH with 2-Car Attached Garage, Partially Finished Basement, Pole Barn and Pond	3.35	\$167.30	May-24

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Test Area Sale 1 (Adjoining Property 110) with the Dunn's Bridge Solar Project (red arrow) in the background



Test Area Sale 2 (Adjoining Property 126, blue arrow) with the Dunn's Bridge Solar Project (red arrow) in the background

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

We analyzed eight Control Area Sales of single-family homes with similar construction and use that were located within Jasper County and that sold within a reasonable time frame from the sale dates of the Test Area Sales in Group 1. The Control Area Sales for Group 1 are single-family homes located on lots in between 1.00 and 10.00-acres in size with three to five bedrooms and two and a half to four baths, consisting of between 3,000 square feet and 3,900 square feet of gross living area, and built between 1994 and 2008.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Dunn's Bridge Solar Project – Group 1 is presented below.

CohnReznick Paired Sale Analysis Dunn's Bridge Solar Farm Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (2)	Adjoining solar farm	\$150.56
Control Area Sales (8)	No: Not adjoining solar farm	\$149.72
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		0.56%

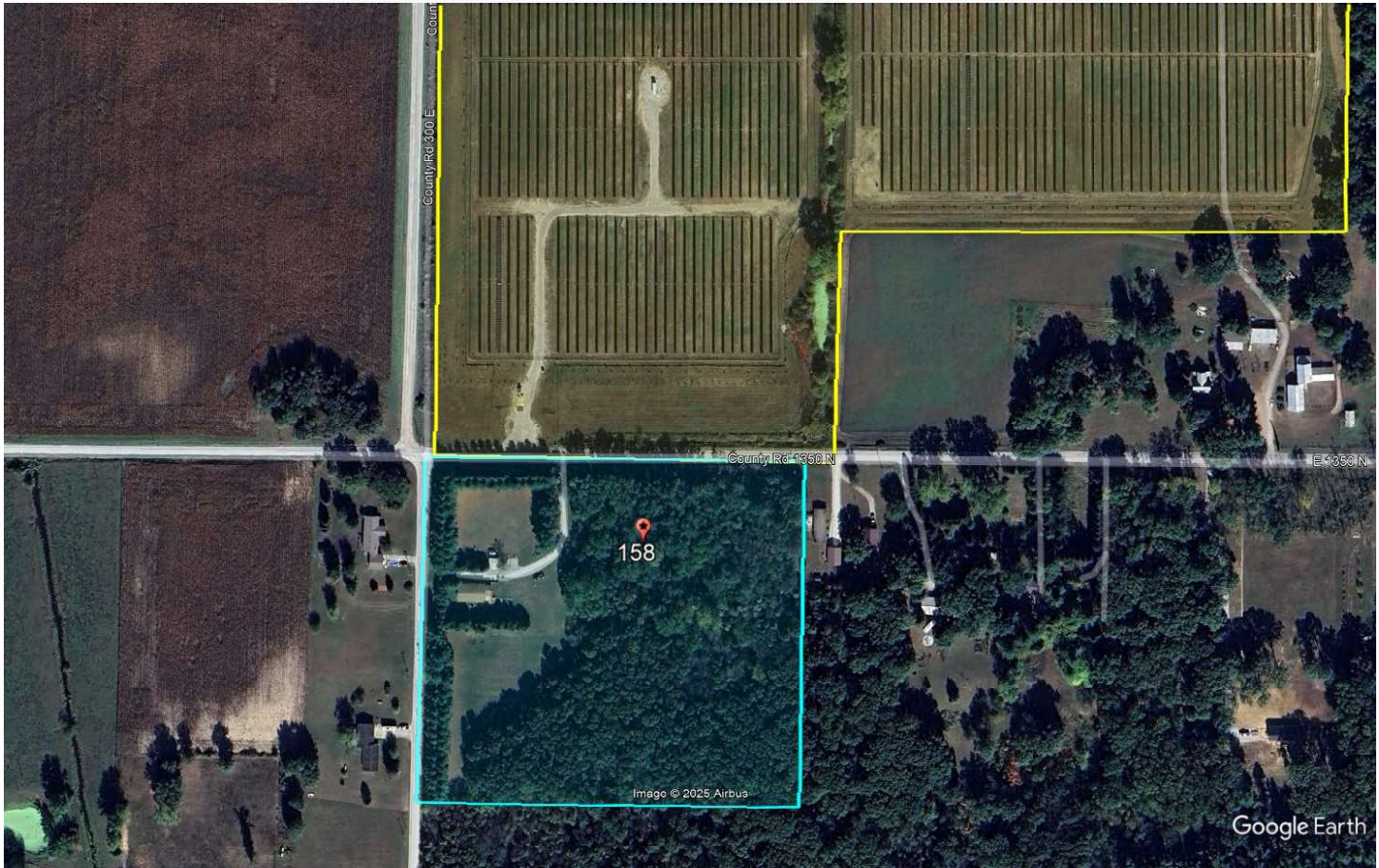
Noting no negative price differential, therefore it does not appear that the Dunn's Bridge Solar installation impacted the sale prices of the Test Area Sales in Group 1. The Test Area Sales indicate a slightly higher unit sales price than the Control Area Sales, but the difference is relatively nominal.

Noting no negative marketing time differential, the Test Area Sales sold after an average of 69 days on market, while the Control Area Sales sold between 56 and 156 days, with a median time on market of 109 days.

Group 2 – Improved Single-Family Residential Properties

Adjoining Property 158 to the Dunn's Bridge Solar Project was considered for a paired sales analysis, and we have analyzed this property as single-family home use in Group 2. The property is a one-story single-family home constructed in 1980, with an attached garage and detached garage/workshop, on a 11.00-acre lot, and located within Jasper County. The property line of Adjoining Property 158 is approximately 200 feet from the closest solar panel, while the improvements are approximately 440 feet from the closest solar panel. The following table outlines the other important characteristics of the Test Area Sale for Group 2, Adjoining Property 158.

SUMMARY OF TEST AREA SALE Group 2 - Dunn's Bridge Solar Farm										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
158	3041 E 1350 N, Wheatfield	\$290,000	2	1.0	1980	1,100	1-Story SFH with 2-Car Attached Garage and 1-Car Detached Garage/Workshop	11.00	\$263.64	May-24



Test Area Sale 3 (Adjoining Property 158, red star) adjacent to the Dunn's Bridge Solar Project (yellow outline)

We analyzed seven Control Area Sales of single-family homes with similar construction and use that were located within Jasper County and that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 2. The Control Area Sales for Group 2 are single-family homes located on lots over 5-acres in size with two to four bedrooms and one to two baths, consisting of less than 2,000 square feet of gross living area, and built between 1976 and 1995.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Dunn's Bridge Solar Project – Group 2 is presented below.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis Dunn's Bridge Solar Farm Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price PSF
Test Area Sale (1)	Adjoining solar farm	\$263.64
Control Area Sales (7)	No: Not adjoining solar farm	\$213.04
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		23.75%

Noting no negative price differential, therefore it does not appear that the Dunn's Bridge Solar installation impacted the sale price of the Test Area Sale in Group 2. The Test Area Sale has a higher unit price which we believe is due to the Test Area Sale consisting of two parcels, allowing the option of constructing another dwelling or selling the excess land parcel.

Noting no negative marketing time differential, the Test Area Sale sold after 24 days on market, while the Control Area Sales sold between 37 and 227 days, with a median time on market of 76 days.

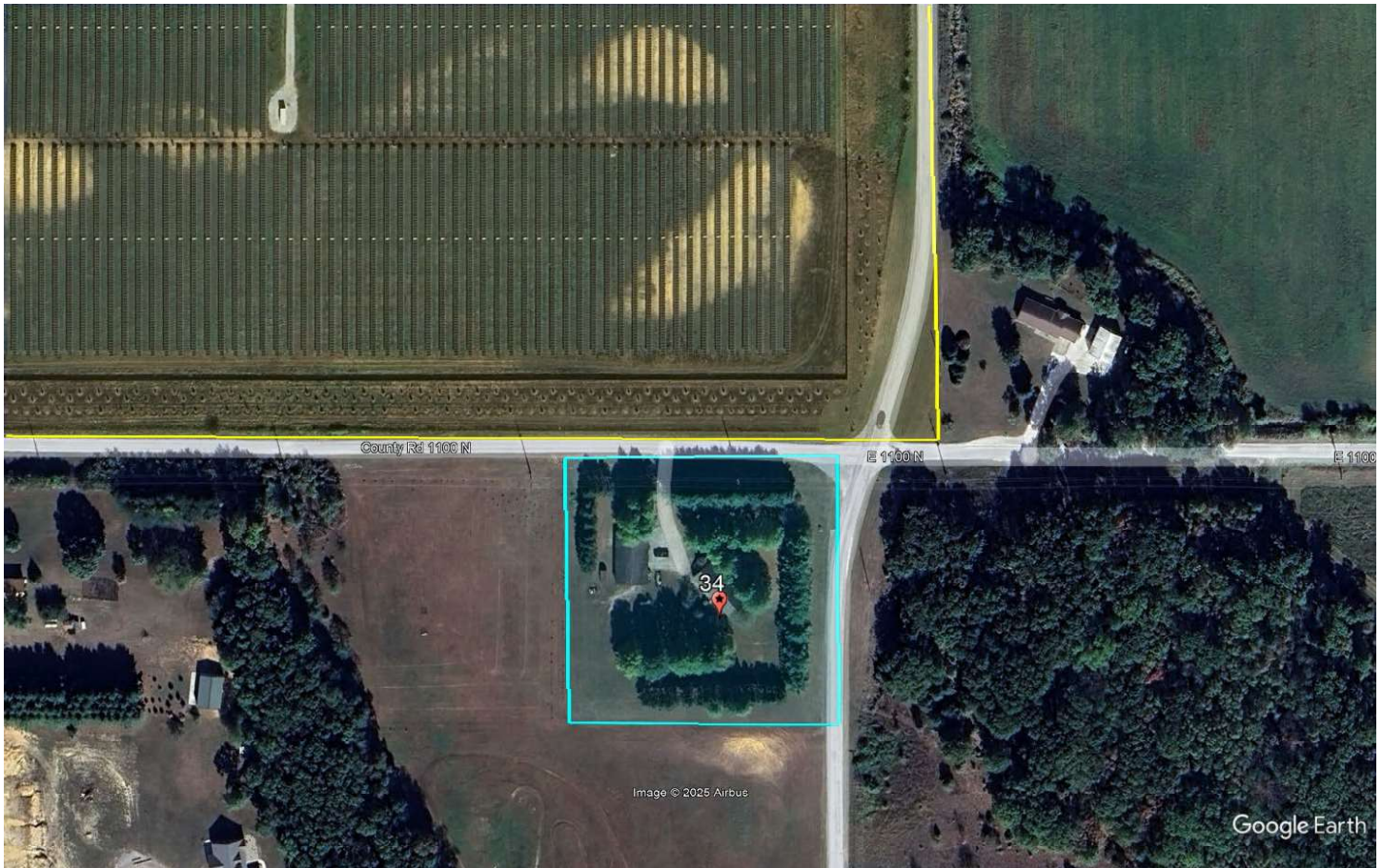
The differential between the Test Area Sale and Control Area Sales is much higher than any of our other studies; we have considered this to be an outlier. While the indication shows that the adjacent solar farm has not negatively impacted the property value for this home, we have considered that this house has "set the market" for this kind of property type (home style, age, and acreage) – we believe that this differential will likely stabilize in the near future as other homes catch up to the appreciation shown by Adjoining Property 158. Thus, we have not included this Group in the collection of impact studies in our conclusion.

Group 3 – Improved Manufactured Residential Properties

Adjoining Property 34 to the Dunn's Bridge Solar Project was considered for a paired sales analysis, and we have analyzed these properties as single-family home uses in Group 3. The property is a single-story manufactured homes constructed in 1996, with detached garage parking, on a 2.63-acre lot, and located within Jasper County. For Adjoining Property 34, the property line is approximately 135 feet from the closest solar panel, while the improvements are approximately 240 feet from the closest solar panel. The following table outlines the other important characteristics of the Test Area Sales for Group 1, Adjoining Properties 34 and 189.

SUMMARY OF TEST AREA SALES Group 3 - Dunn's Bridge Solar Farm										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
34	2993 E 1100 N, Wheatfield, IN 46392	\$255,000	3	2.0	1996	1,809	1-Story Manufactured Home with Detached 5-Car Garage/Workshop	2.63	\$140.96	Dec-24

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Test Area Sale 4 (Adjoining Property 34, red star) adjacent to the Dunn's Bridge Solar Project (yellow outline)

We analyzed ten Control Area Sales of manufactured homes with similar construction and use that were located within Jasper County and that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 3. The Control Area Sales for Group 3 are single-family homes located on lots in between 1.00 and 4.28-acres in size with three bedrooms and two baths, consisting of between 1,100 square feet and 2,100 square feet of gross living area, and built between 1981 and 2002.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Dunn's Bridge Solar Project – Group 3 is presented below.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis Dunn's Bridge Solar Farm Group 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price PSF
Test Area Sale (1)	Adjoining solar farm	\$140.96
Control Area Sales (10)	No: Not adjoining solar farm	\$143.84
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		-2.00%

Noting minimal price differential, therefore it does not appear that the Dunn's Bridge Solar installation impacted the sale price of the Test Area Sale in Group 3. The Test Area Sale indicates a slightly lower unit sales price than the Control Area Sales, but the difference is relatively nominal.

Noting no minimal marketing time differential, the Control Area Sales sold between 22 and 395 days, while the Test Area Sale sold after 83 days on market, within the range of comparable sales in the surrounding area.

SOLAR FARM 2: ASSEMBLY SOLAR FARM, SHIAWASSEE COUNTY, MI**Coordinates:** 43.042516, -83.936119**PINs:** Multiple**Population Density (2023):** 126 people per square mile (Shiawassee County)**Total Land Size:** Approximately 1,900 acres**Date Project Announced:** January 2019**Date Project Completed:** January 2022**Output:** 239 MW AC**Date Study Completed:** November 2023 **Date Study Updated:** September 2025

The Assembly Solar Farm is located in Shiawassee County, Michigan. The current owner of the solar farm is an affiliate of D.E. Shaw Renewable Investments (DESRI) and was developed in a partnership between DESRI and

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Ranger Power. The solar farm went into operation in three phases, with the first phase becoming operational in December 2020, the second phase in December 2021 and the third phase in January 2022. The solar farm can generate power for approximately 45,000 homes. Nearly 800,000 bifacial solar modules comprise the farm.

The Surrounding Area: The Assembly Solar Farm solar installation is located in the Hazelton and Venice Townships, in the Northeastern portion of Shiawassee County, Michigan. Shiawassee County is located in central Michigan. Assembly Solar Farms is the largest solar farm in Michigan, and nearly doubled the state's solar output by adding 239 MW AC. As of July 2025, per the U.S. Energy Information Administration, there are 68 operating solar farms in Michigan totaling 1,766.1 MW, and only two other solar farms in Shiawassee County, the 20 MW Lyons Road Farm which became operational in January 2022, and the 20 MW Midcontinent Solar Project which became operational in October 2023.

The Immediate Area: Surrounding land uses consist of residential homes, vacant residential lots, and farmland to the north, west, south, and east. The project site was leased from eight landowners for between 20 and 40 years. The solar farm is surrounded by landscaped vegetation buffers.

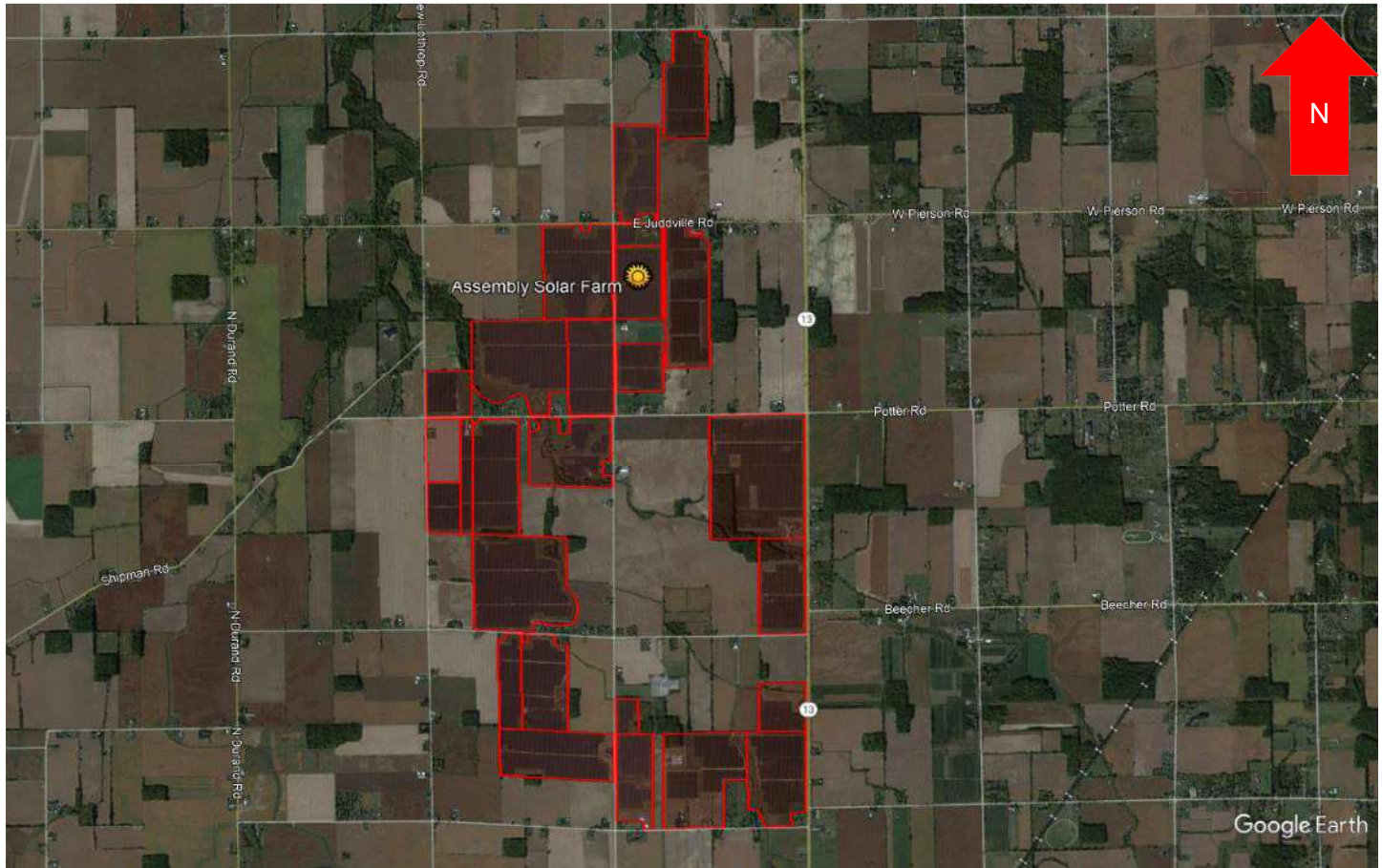
Real Estate Tax Info:

In 2019, prior to the property being assessed as a solar farm, the assessed value of the underlying land was \$4,742,200 and ownership paid \$63,311 in real estate taxes. In 2022, after the completion of the solar farm, the assessed value of the participating parcels increased 5.40 percent to \$4,998,200 and real estate taxes increased 60.77 percent to \$101,784.

Pin	Acres	2019 Taxes Paid	2022 Taxes Paid	Tax Increase	2019 Assessed Value	2022 Assessed Value	Value Increase
Shiawassee County							
004-25-100-001-01	68.2	\$2,630	\$4,371	66.20%	\$169,300	\$149,000	-11.99%
004-25-300-001-01	76.0	\$2,294	\$4,071	77.48%	\$175,700	\$154,600	-12.01%
004-36-100-002-01	60.0	\$2,007	\$3,333	66.06%	\$146,200	\$128,700	-11.97%
004-35-300-003-04	132.7	\$4,956	\$8,828	78.12%	\$327,700	\$288,400	-11.99%
004-35-300-002	40.0	\$1,710	\$2,848	66.55%	\$93,800	\$82,500	-12.05%
008-02-100-001	92.6	\$2,506	\$2,818	12.47%	\$228,300	\$237,700	4.12%
008-02-100-003	24.4	\$973	\$1,098	12.86%	\$61,800	\$64,300	4.05%
008-02-100-004	28.2	\$582	\$693	19.12%	\$63,500	\$66,200	4.25%
004-36-100-002	18.7	\$4,015	\$6,538	62.82%	\$116,400	\$124,100	6.62%
008-02-400-001	156.2	\$3,170	\$3,536	11.54%	\$445,400	\$505,100	13.40%
008-11-400-006	100.0	\$3,066	\$3,411	11.28%	\$278,500	\$288,000	3.41%
008-11-100-001	39.0	\$824	\$958	16.33%	\$88,300	\$89,500	1.36%
008-11-200-003	78.0	\$1,420	\$1,622	14.20%	\$168,000	\$169,700	1.01%
004-36-300-004	40.0	\$1,164	\$1,268	8.90%	\$97,500	\$91,700	-5.95%
008-12-300-004	120.0	\$7,147	\$7,753	8.49%	\$433,700	\$457,500	5.49%
008-12-200-003	40.0	\$1,741	\$1,894	8.81%	\$126,400	\$135,800	7.44%
008-02-100-002-03	40.0	\$4,331	\$4,730	9.20%	\$210,900	\$223,100	5.78%
008-12-400-001-01	87.7	\$1,765	\$9,208	421.60%	\$195,200	\$203,600	4.30%
008-01-200-001-01	239.7	\$8,486	\$9,241	8.90%	\$571,000	\$603,000	5.60%
008-01-400-002	79.8	\$1,130	\$1,263	11.78%	\$87,400	\$91,200	4.35%
008-02-200-001-01	18.8	\$413	\$2,050	396.85%	\$43,400	\$45,300	4.38%
008-02-200-001-02	42.4	\$590	\$4,609	681.09%	\$97,700	\$101,900	4.30%
008-12-300-001-02	60.5	\$25	\$4,007	15769.35%	\$0	\$237,600	0.00%
008-12-100-009	15.6	\$340	\$1,637	381.14%	\$34,300	\$35,800	4.37%
004-35-200-001-02	119.1	\$3,245	\$5,376	65.66%	\$289,300	\$254,500	-12.03%
004-35-400-001	80.0	\$2,781	\$4,622	66.19%	\$192,500	\$169,400	-12.00%
Total	1,897.6	\$63,311	\$101,784	60.77%	\$4,742,200	\$4,998,200	5.40%

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The following map displays the parcels located within the solar farm (outlined in red).



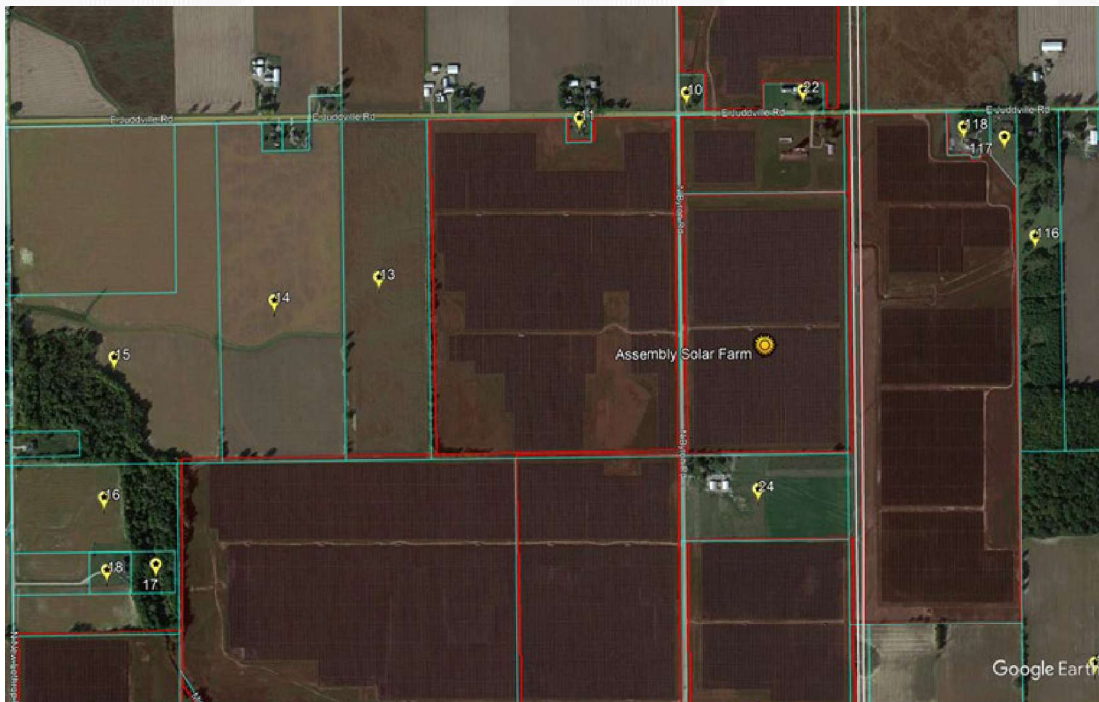
Aerial imagery retrieved from Google Earth, dated October 2022

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The following maps display the parcels located within the solar farm (outlined in red). Properties adjoining the solar parcels (outlined in yellow) are numbered for subsequent analysis.



Assembly Solar Farm – Adjoining Properties



Assembly Solar Farm – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Assembly Solar Farm – Adjoining Properties

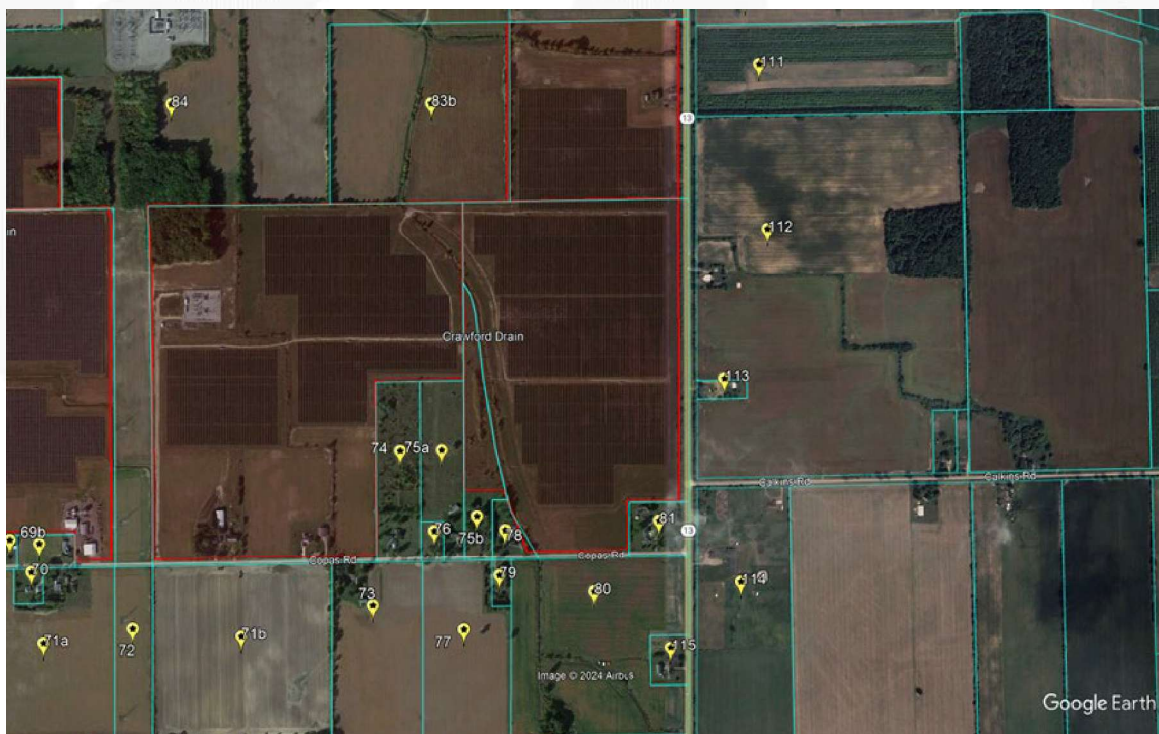


Assembly Solar Farm – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Assembly Solar Farm – Adjoining Properties



Assembly Solar Farm – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

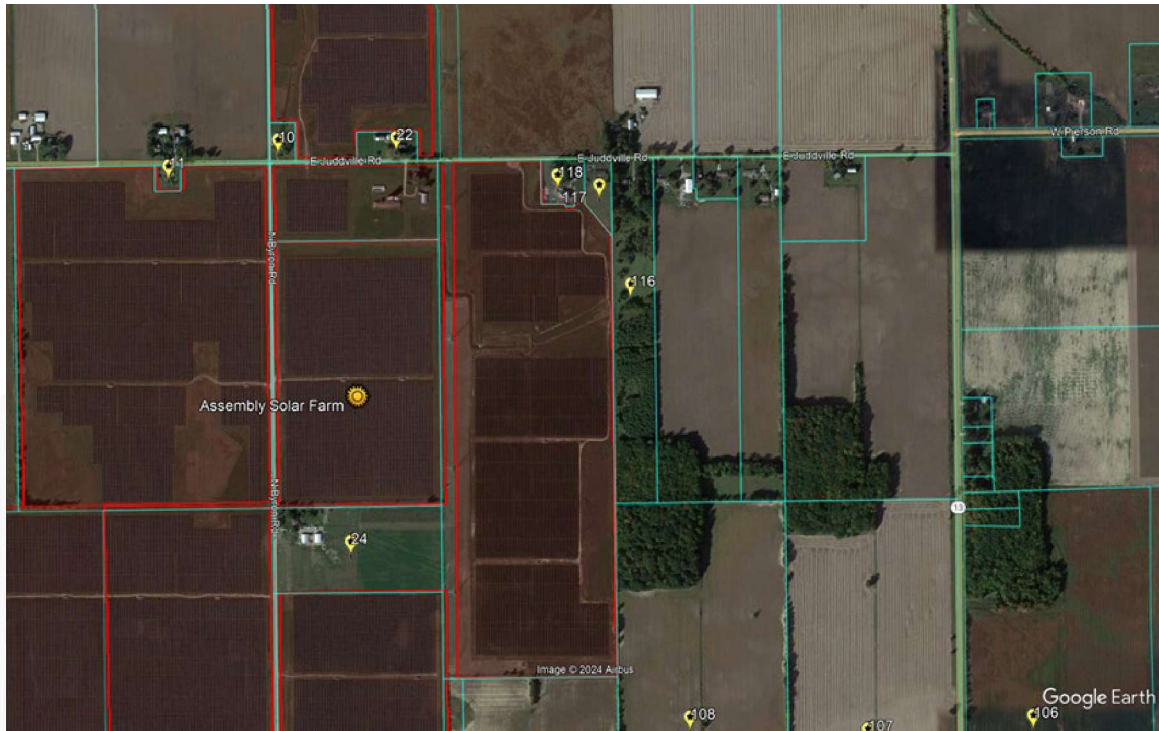


Assembly Solar Farm – Adjoining Properties



Assembly Solar Farm – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Assembly Solar Farm – Adjoining Properties

PAIRED SALES ANALYSIS

In reviewing Adjoining Properties to study in a Paired Sale Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

We identified seventeen Adjoining Properties that sold since the solar farm started operation in December 2020, including eleven single-family residential properties have sold since the solar farm started operation, Adjoining Properties 1, 24, 28, 29, 69, 88, 98, 99 and 113. We have not included the sale of Adjoining Properties 1, 29, 69, and 88 in our analysis as they were off-market transactions. We have not included the sale of Adjoining Property 113 as its sale price was impacted by problems with the septic tank on the property, according to the listing agent, Ms. Jessica Schmidt. The sale of Adjoining Properties 15, 19, 31, 47, 61, 80 and 85, all of which are an agricultural use, have not been included in our analysis as they were all non-arm's length transactions, per the Shiawassee County public records.

Additionally, we have not included the sale of Adjoining Property 98 due to a lack of comparable transactions in the local market. Adjoining Property 98 is located along North Sheridan Road and is comprised of a single-family home with an unfinished basement, farm structure and an 8.72-acre lot. In our search of comparable improved residential sales, other properties that have sold in the area during the same time frame either have very different lot sizes or incomparable improvements and therefore, there were insufficient comparable control transactions. The sales of Adjoining Properties 24, 28, and 99 were considered to be arm's length transactions and were studied. Our analysis of these transactions is presented next.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 24 to the Assembly Solar Farm was considered for a paired sales analysis, and we analyzed this property as a single-family home use in Group 1. The improvements on the property surrounded on four sides by the Assembly Solar Farm, Phase II and are located 120 feet to the nearest boundary of the Assembly Solar Farm, Phase II.

SUMMARY OF TEST AREA SALE Group 1 - Assembly Solar Farm										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
24	3496 N. Byron Road	\$321,999	3	2.0	1974	1,851	Single-Family Home with Finished Basement, Enclosed Porch, and Farm Structures	20.00	\$173.96	Sep-21

We analyzed six Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 1. The Control Area Sales for Group 1 are single-family homes with three to four bedrooms and one and a half to two and a half baths, consist of between 1,700 square feet and 2,100 square feet of gross living area, a lot size between 10 and 40 acres (median lot size of 17.9-acres), and contain farm structures. Additionally, the Control Area Sales for Group 1 are all located within Shiawassee County.



Assembly Solar Farm – Test Area Sale Map, Group 1

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Assembly Solar Project – Group 1 is presented below.

CohnReznick Paired Sale Analysis Assembly Solar Farm - Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$173.96
Control Area Sales (6)	No: Not adjoining solar farm	\$178.06
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		-2.30%

The median days on market for the Control Area sales was 42 days (ranging from 30 to 136 days), while the days on market for Adjoining Property 24 was 87 days. However, Adjoining Property 24 was listed for sale at \$319,900 and ultimately sold for \$321,999 or a 0.66% increase from the list price.

Noting minimal price differential, it does not appear that the Assembly Solar Farm use impacted the sale price of the Test Area Sale, Adjoining Property 24.

Group 2a – Improved Single-Family Residential Properties

Adjoining Property 28 to the Assembly Solar Farm was considered for a paired sales analysis, and we analyzed this property as a single-family home use in Group 2a. The improvements on the property are located 155 feet to the nearest boundary of the Assembly Solar Farm, Phase II.

SUMMARY OF TEST AREA SALE Group 2a - Assembly Solar Farm										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
28	10385 E Cronk Road	\$215,000	3	2.0	1965	1,488	Single-Family Home with Attached Garage, Finished Basement, Patio, and Farm Structures	1.60	\$144.49	May-21

We analyzed 17 Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 2a. The Control Area Sales for Group 2a are single-family homes with three to four bedrooms and one and a half to three baths, consist of between 1,300 square feet and 1,750 square feet of gross living area, a lot size between 1 and 5 acres, and contain farm structures. Additionally, the Control Area Sales for Group 2a are all located within Shiawassee County.



Aerial View, Adjoining Property 28, Test Area Sale Group 2a

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Assembly Solar Farm – Test Area Sale Map, Group 2a

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Assembly Solar Project – Group 2a is presented below.

CohnReznick Paired Sale Analysis Assembly Solar Farm - Group 2a		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$144.49
Control Area Sales (17)	No: Not adjoining solar farm	\$140.74
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		2.67%

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The days on market for the Test Area Sale was 20 days on market, while the median days on market for the Control Area sales was 43 days (ranging from 17 to 288 days), **and we note no negative marketing time differential.**

Noting no negative price differential, it does not appear that the Assembly Solar Farm use impacted the sale price of the Test Area Sale, Adjoining Property 28.

Group 2b – Improved Single-Family Residential Properties

Adjoining Property 28 to the Assembly Solar Farm was considered for a paired sales analysis, and we analyzed this property as a single-family home use in Group 2b. After selling in May 2021 for \$215,000, Adjoining Property 28 sold again in March 2023 for \$250,000, an overall 16.28% increase in sale price or an increase of 0.70% per month in sale price in between the two dates of sale. The appreciate rate between the two sale dates are analyzed further in a Repeat Sales Analysis later in this section. The improvements on the property are located 155 feet to the nearest boundary of the Assembly Solar Farm, Phase II.

SUMMARY OF TEST AREA SALE Group 2b - Assembly Solar Farm										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
28	10385 E Cronk Road	\$250,000	3	2.0	1965	1,488	Single-Family Home with Attached Garage, Finished Basement, Patio, and Farm Structures	1.60	\$168.01	Mar-23

We analyzed 13 Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 2b. The Control Area Sales for Group 2b are single-family homes with three to four bedrooms and one and a half to three baths, consist of between 1,300 square feet and 1,750 square feet of gross living area, a lot size between 1 and 5 acres, and contain farm structures. Additionally, the Control Area Sales for Group 2b are all located within Shiawassee County.



Aerial View, Adjoining Property 28, Test Area Sale Group 2b

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Assembly Solar Farm – Test Area Sale Map, Group 2b

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Assembly Solar Project – Group 2b is presented below.

CohnReznick Paired Sale Analysis Assembly Solar Farm - Group 2b		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$168.01
Control Area Sales (13)	No: Not adjoining solar farm	\$163.36
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		2.85%

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The days on market for the Test Area Sale was 42 days on market, while the median days on market for the Control Area sales was 37 days (ranging from 17 to 83 days), **and we note minimal marketing time differential.**

Noting no negative price differential, it does not appear that the Assembly Solar Farm use impacted the sale price of the Test Area Sale, Adjoining Property 28.

Group 3 – Improved Single-Family Residential Properties

Adjoining Property 99 to the Assembly Solar Farm was considered for a paired sales analysis, and we analyzed this property as a single-family home use in Group 3. The property line is approximately 590 feet from the closest solar panel, and the improvements are approximately 780 feet from the closest solar panel of the Assembly Solar Farm, Phase III. The following table outlines the other important characteristics of Adjoining Property 99.

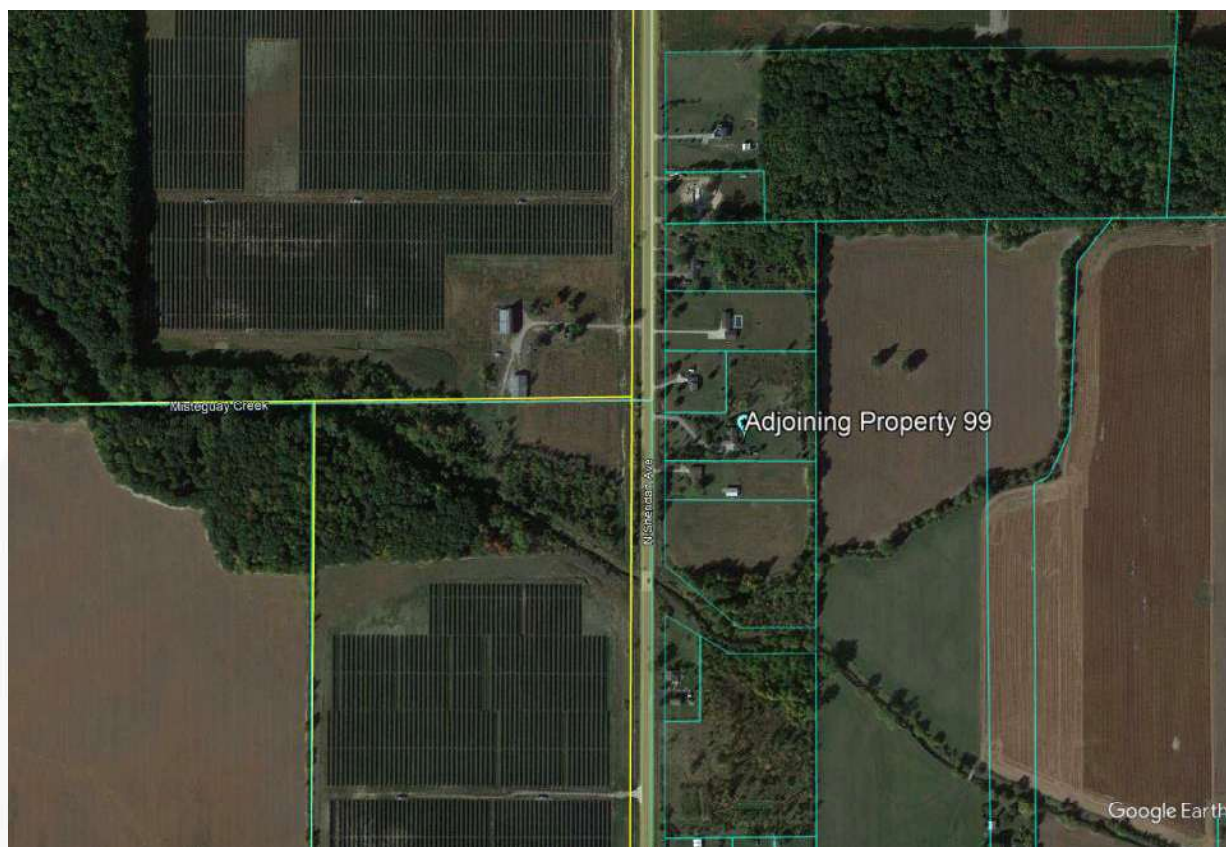
SUMMARY OF TEST AREA SALE Group 3 - Assembly Solar Farm										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
99	2182 N. Sheridan Road	\$340,000	3	2.5	1996	1,930	Single-Family Home with Attached Garage, Partially Finished Basement, and Farm Structure	4.82	\$176.17	Jan-22

We analyzed six Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 3. The Control Area Sales for Group 3 are one-story single-family homes with three to four bedrooms, two to three baths, consist of between 1,576 square feet and 2,412 square feet of gross living area, a finished or partially finished basement, a lot size between 2 and 10 acres (median lot size of 4.5-acres), and contain farm structures. Additionally, the Control Area Sales for Group 3 are all located within Shiawassee County.



Aerial View, Adjoining Property 99, Test Area Sale Group 3

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Assembly Solar Farm – Test Area Sale Map, Group 3

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Assembly Solar Project – Group 3 is presented below.

CohnReznick Paired Sale Analysis Assembly Solar Farm - Group 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$176.17
Control Area Sales (6)	No: Not adjoining solar farm	\$151.53
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		16.26%

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The days on market for the Test Area Sale was 54 days on market, while the median days on market for the Control Area sales was 44 days (ranging from 36 to 102 days), **and we note minimal marketing time differential.**

Noting no negative price differential, it does not appear that the Assembly Solar Farm use impacted the sale price of the Test Area Sale, Adjoining Property 99.

Before & After Analysis – Assembly Solar Farm

We note the Test Area Sale in Groups 2a and 2b of the Assembly Solar Farm (Adjoining Property 28) and the Test Area Sale in Group 3 of the Assembly Solar Farm (Adjoining Property 99) have sold at least twice over the past 5 years. To determine if any of the rates of appreciation for these identified home sales were affected by the proximity to the Assembly Solar Farm, we prepared a Repeat-Sales Analysis on each identified adjoining property. First, we calculated the total appreciation between each sale of the same property, the number of months that elapsed between each sale, and determined the monthly appreciation rate. Then, we compared extracted appreciation rates reflected in the Federal Housing Finance Agency (FHFA) Home Price Index for Michigan's 484 Three Digit Zip Code, where Adjoining Properties 28 and 99 are located, over the same period. The index for the zip code is measured on a quarterly basis and is presented below.

Shiawassee County - Housing Price Index Change (Year over Year) Not Seasonally Adjusted				
Year	Annual Change (%)	HPI	HPI with 1990 base	HPI with 2000 base
2000	9.27	387.04	183.07	100.00
2001	4.74	405.37	191.74	104.74
2002	3.86	421.04	199.15	108.78
2003	2.52	431.63	204.16	111.52
2004	4.24	449.91	212.81	116.24
2005	4.68	470.99	222.77	121.69
2006	-0.30	469.57	222.10	121.32
2007	-5.12	445.54	210.74	115.11
2008	-6.90	414.81	196.20	107.18
2009	-9.94	373.57	176.69	96.52
2010	-8.55	341.63	161.59	88.27
2011	-5.12	324.14	153.32	83.75
2012	-4.96	308.08	145.72	79.60
2013	3.80	319.78	151.25	82.62
2014	4.33	333.64	157.81	86.20
2015	8.18	360.92	170.71	93.25
2016	3.85	374.81	177.29	96.84
2017	7.72	403.74	190.97	104.31
2018	6.23	428.90	202.87	110.81
2019	5.92	454.28	214.87	117.37
2020	3.08	468.26	221.48	120.98
2021	11.80	523.50	247.61	135.26

We have presented the full repeat sales analysis on the following page.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Repeat Sales Analysis										484 Three Digit Zip Code - FHFA Housing Price Index Change					
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Quarter of Most Recent Sale	Prior Sale Quarter Index Level	Total Appreciation	Monthly Appreciation Rate	
28	10385 E Cronk Road	1.60	1,488	5/27/2021	\$215,000	7/10/2018	\$155,000	38.71%	35	0.95%	210.78	172.84	21.95%	0.58%	
28	10385 E Cronk Road	1.60	1,488	3/13/2023	\$250,000	5/27/2021	\$215,000	16.28%	22	0.70%	243.42	210.78	15.49%	0.67%	
99	2182 N. Sheridan Road	4.82	1,930	1/4/2022	\$340,000	7/30/2021	\$330,000	3.03%	5	0.58%	233.33	222.93	4.67%	0.92%	
Median - Test Area Sales										0.70%					0.67%

Conclusion

When compared to the FHFA home price index for the 484-zip code, the median monthly appreciation rate for the resale of Adjoining Property 28, that sold three times in the previous five years, and Adjoining Property 99 that sold twice in the previous five years, exhibited a higher rate of appreciation than the Home Price Index for the 484-zip code. As such, we have concluded that there does not appear to be a consistent detrimental impact on properties adjacent to the Assembly Solar Farm.

Adjoining Property 99 sold on July 30th, 2021 for \$330,000 and again five months later on January 4th, 2022 for \$340,000 representing an increase of 0.58% per month or \$10,000 overall. Given the short time difference between the two dates of sale we could not compare FHFA index levels for Shiawassee County as the index tracks annual change. We spoke with the selling agent for Adjoining Property 99, Ms. Linda Wells, who reported that the property owner who purchased and sold the property after five months had sold the property due to personal matters and not due to any issue with the house or surrounding area. Additionally, Ms. Wells indicated that both sales of Adjoining Property 99 were at market and that there was no impact from the solar farm on the sales price.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

SOLAR FARM 3: DTE'S LAPEER SOLAR PROJECT, LAPEER, MICHIGAN**Coordinates:** Latitude 43.0368219316, Longitude -83.3369986251**PINs:** L20-95-705-050-00, L20-98-008-003-00**Population Density (2020):** 137 people per square mile (Largest City = Lapeer)**Owner of Record:** DTE Electric Company & City of Lapeer**Total Land Size:** ±365 Acres**Date Project Announced:** 2016**Date Project Completed:** May 2017**Output:** 48.28 MW AC**Date Study Completed:** August 2020**Date Study Updated:** December 2021

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Overview and Surrounding Area:

The DTE Lapeer solar farm is located just south of the City of Lapeer, in Lapeer County, Michigan and is a joint project between the City of Lapeer and DTE Electric Company. The solar farm was developed with Inovateus Solar MI, LLC to meet Michigan renewable energy standards. The solar farm features over 200,000 panels, a power output of 48.28 MW AC, and produces enough energy to power 14,000 homes. The Lapeer solar project was developed in two phases: the Demille Solar installation and the Turrill Solar installation. For purposes of our study, taken together, both installations are considered one solar farm.



DTE's Lapeer Solar Projects Demille and Turrill Solar installations

Lapeer is considered to be in the Tri-Cities area of central Michigan and is approximately 21 miles east of the City of Flint. Interstate-69 serves Lapeer and runs east-west just south of the solar farm. The two phases of the solar installation are on the east and west sides of Michigan State Route 24 from each other.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The Immediate Area:

Land uses surrounding the Demille installation include a correctional facility and industrial uses to the west, buffered by a mature stand of trees, a retail center to the northeast, other commercial uses to the east along MI-24/South Lapeer Road, and residential homes to the southeast. Interstate-69 runs south of the Demille solar installation.

The Turrill installation is surrounded to the north by a residential subdivision, to the north and east by industrial uses, to the south by vacant land and residential homes, and to the west by light commercial and professional uses along MI-24/South Lapeer Road. Hunter's Creek divides two sets of solar arrays in the Turrill installation.

The Demille installation adjoins Interstate-69 to the South; while a residential subdivision adjoins the solar farm to the east. To the northeast corner of the solar panels is a senior living facility, Stonegate Health Campus, developed before the solar facility.

Prior Use: Agricultural use

Real Estate Tax Information:

Prior to the development of the solar farm, the land under the Demille and Turrill solar installations were municipal-owned and were not subject to property tax. After development, in 2017, the land became taxable and taxes were \$82,889 total, as shown below.

PIN	Acres	2016 Taxes Paid	2017 Taxes Paid	Tax Increase	2016 Assessed Value	2017 Assessed Value	Value Increase
Lapeer County, MI							
L20-98-008-003-00*	110.84	\$ -	\$ 34,294	N/A	\$ -	\$ 726,700	N/A
L20-95-705-050-00*	254.84	\$ -	\$ 48,595	N/A	\$ -	\$ 1,029,750	N/A
TOTAL	365.68	\$ -	\$ 82,889	N/A	\$ -	\$ 1,756,450	N/A

* Prior to development as a solar farm, the parcels were municipal property without a taxable value.

Paired Sale Analysis:

The maps, below, and on the following pages display properties adjoining the solar sites that are numbered in red for subsequent analysis.

Demille Solar Farm

DTE's Lapeer Solar Projects - Demille Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



DTE's Lapeer Solar Projects - Demille Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Turrill Solar Farm



DTE's Lapeer Solar Projects - Turrill Adjoining Properties



DTE's Lapeer Solar Projects - Turrill Adjoining Properties

In reviewing Adjoining Properties to study in a Paired Sale Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

We identified eight Adjoining Properties that sold since the solar farm started operations in May of 2017: Adjoining Properties 3, 4, 7, 9, 10, and 16 for the Demille Solar Farm, and Adjoining Properties 3 and 4 for the Turrill Solar Farm. Of these properties, three were considered atypical for the area.

Adjoining Property 7 adjacent to the Demille Solar farm is a split-level home with a finished walk out basement with a pool. The typical home in the area has a traditional basement and pools are atypical. The unusual nature of this sale was confirmed with the selling broker, Renee Voss (see comments below). We note that this home sold twice after the construction of the solar farm, once in September 2018 and again in August 2019. The appreciate rate between the two sale dates are analyzed further later in this section.

Adjoining Property 16 just south of the Demille Solar Farm is a 10.1-acre lot that is buffered by trees. The home is atypical for the area, as most homes are situated on lots between 1-acre and 1.5-acres in size and were built before 1980; this home was built in 2008. We interviewed the broker Josh Holbrook (see comments below) who confirmed the atypical nature of this property.

Adjoining Property 3, just west of the Turrill Solar Farm, was a ranch home with 1,348 square feet on a lot that was just over one acre. Comparables for homes of this size, type, and lot size were not available in the immediate market area. It should be noted that the price per square foot for this home (\$108.01) is significantly higher than median price per square foot of either data set we studied.

As a part of our research, we interviewed three local real estate brokers that sold homes adjacent to the Lapeer Solar farm. According to the brokers, there was no impact on the home prices or marketability due to the homes' proximity to the solar arrays.

Renee Voss of Coldwell Banker, selling broker of the raised ranch at 1138 Don Wayne Drive (Adjoining Property 7), which is adjacent to the Demille solar farm at the southeast corner, noted that there was no impact on this sale from the solar farm located to the rear. The home, which has a pool in the backyard, sold quickly with multiple offers, Voss stated.

Josh Holbrook, the selling broker of 1408 Turrill Road (known as Adjoining Property 16), located just south of the Demille Solar Farm, said the solar farm had no impact on the sale and that the community takes pride in the solar farm.

Anne Pence of National Realty Centers, the selling broker for 1126 Don Wayne Drive, a single-family home adjacent to the Demille solar farm (known as Test Area Sale 9), reported that "the solar farm did not have any effect on the sale of this home. The buyers did not care one bit about the solar field in the back yard. The fact is that you know no one is going to be behind you when they develop a solar farm in your back yard. And [sometimes the developer] put up trees to block the view. My in-laws also actually live at end of that street, even though they haven't sold or put their house on market, they don't mind the solar panels either. It's not an eyesore. And another house sold on that block, a raised ranch home, and it sold with no problems."

Group 1 – Demille:

Adjoining Properties 3, 4, and 9 to the Demille Solar Farm were considered for a paired sales analysis, and we analyzed these properties as single-family home uses in Group 1. The improvements on these properties are located between 275 to 305 feet to the nearest solar panel.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Test Area Sales Group 1 - Demille Solar									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median Square Feet	Median Sale Date	Median Price PSF
3, 4, 9	1174 Alice Dr, 1168 Alice Dr, 1126 Don Wayne Drive	\$165,000	0.50	3	2.0	1973	1,672	Jan-19	\$105.26

We analyzed six Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the median sale date of the Test Area Sales in Group 1. The Control Area Sales for Group 1 are ranch homes with three bedrooms and one and a half to two bathrooms. We excluded sales that were bank-owned, and those between related parties.

Control Area sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The result of our analysis for DTE's Lapeer Solar Project - Group 1 is presented below.

CohnReznick Paired Sale Analysis DTE Lapeer Solar Group 1 - Demille Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (3)	Adjoining solar farm	\$105.26
Control Area Sales (6)	No: Not adjoining solar farm	\$99.64
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		5.65%

The days on market for the three Test Area Sales had a median of 29 days on market (ranging from 5 to 48 days), while the median days on market for the Control Area sales was 21 days (ranging from 5 to 224 days), **and we note no substantial marketing time differential.**

Group 2 – Demille:

Adjoining Property 10 to the Demille Solar Farm was considered for a paired sales analysis, and we analyzed this property as a single-family home use in Group 2. The improvements on this property is located approximately 315 to the nearest solar panel.

Test Area Sale Group 2 - Demille Solar										
Adj. Property #	Address	Sale Price	Median Site Size (AC)	Bedrooms	Bathrooms	Year Built/Renovated	Square Feet	Other Features	Sale Date	Price PSF
10	1120 Don Wayne Drive	\$194,000	0.47	3	2.5	1976/2006	1,700	Above Ground Pool, Two Car Garage	Nov-19	\$114.12

We analyzed five Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the median sale date of the Test Area Sales in Group 2. The Control Area Sales for Group 2 are similarly sized homes in Lapeer County with three to four bedrooms and two to three bathrooms, with a pool and an attached garage. We excluded sales that were bank-owned, and those between related parties.

Control Area sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The result of our analysis for DTE's Lapeer Solar Project - Group 2 is presented below.

CohnReznick Paired Sale Analysis DTE Lapeer Solar Group 2 - Demille Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (1)	Adjoining solar farm	\$114.12
Control Area Sales (5)	No: Not adjoining solar farm	\$113.01
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		0.98%

The days on market for the Test Area Sales was 90 days on market, while the median days on market for the Control Area sales was 34 days (ranging from 3 to 73 days). We note the Test Area sale was initially listed above its market value, as there was a listing price decline after a month of marketing. We note since the final drop of the list price, there was only 51 days on market, which is within the range exhibited by the Control Area sales.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Group 3 – Turrill:

Adjoining Property 4 to the Turrill Solar Farm was analyzed separately since it is a two-story home on a larger lot as Group 2. The home on Adjoining Property 4 is 290 feet from the property line to the nearest solar panel.

Test Area Sale Group 3 - Turrill Solar									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median Square Feet	Median Sale Date	Median Price PSF
4	1060 Cliff Drive	\$200,500	1.30	4	2.5	1970	2,114	Sep-18	\$94.84

We analyzed four Control Area single-family homes sales with similar construction that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of Adjoining Property 4.

The Control Area Sales for Group 3 are 2-story homes with between two and four bedrooms and 2.5 to 3.0 bathrooms. We excluded sales that were bank-owned, and those between related parties.

Control Area sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The result of our analysis for DTE's Lapeer Solar Project – Group 3 is presented below.

CohnReznick Paired Sale Analysis DTE Lapeer Solar Group 3 - Turrill Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$94.84
Control Area Sales (4)	No: Not adjoining solar farm	\$96.32
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		-1.53%

The days on market for the Test Area Sale was 2 days, while the median days on market for the Control Area sales was 35 days (ranging from 11 to 177 days), **and we note no negative marketing time differential.**

Noting no substantial price differential, it does not appear that the DTE's Lapeer Solar had any negative impact on adjacent property values.

Before & After Analysis – Demille Solar Project:

We note two of the Test Area Sales in Group 1 of the Demille Solar project (Adjoining Properties 4 and 9), one sale in Group 2 of the Demille Solar Farm (Adjoining Property 10), as well as Adjoining Property 7 have sold at least twice over the past 15 years. To determine if any of the rates of appreciation for these identified home sales were affected by the proximity to the Demille Solar farm, we prepared a Repeat-Sales Analysis on each identified adjoining property. First, we calculated the total appreciation between each sale of the same property, the number of months that elapsed between each sale, and determined the monthly appreciation rate. Then, we compared extracted appreciation rates reflected in the Federal Housing Finance Agency (FHFA) Home Price Index for Michigan's 48446 zip code (where the identified homes are located) over the same period. The index for zip codes is measured on a yearly basis and is presented below.

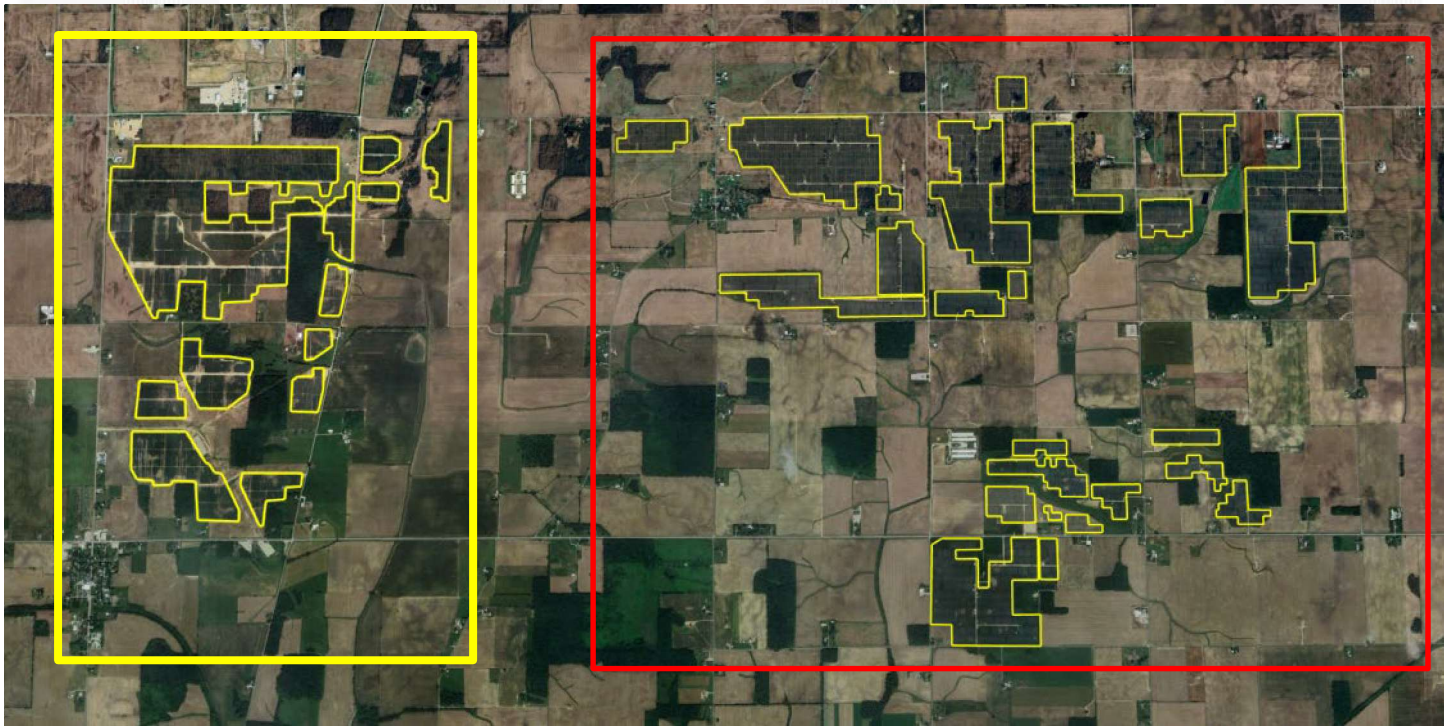
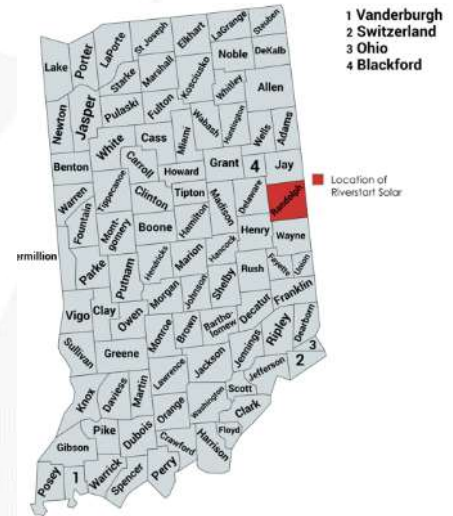
48446 Zip Code - Housing Price Index Change (Year over Year) Not Seasonally Adjusted					
Five-Digit ZIP Code	Year	Annual Change (%)	HPI	HPI with 1990 base	HPI with 2000 base
48446	2004	2.02	438.38	206.29	111.35
48446	2005	3.68	454.53	213.89	115.45
48446	2006	-1.76	446.53	210.12	113.42
48446	2007	-6.35	418.17	196.78	106.22
48446	2008	-8.37	383.17	180.31	97.33
48446	2009	-10.62	342.49	161.16	86.99
48446	2010	-8.94	311.86	146.75	79.21
48446	2011	-6.89	290.37	136.64	73.75
48446	2012	0.29	291.22	137.04	73.97
48446	2013	7.27	312.39	147.00	79.35
48446	2014	7.10	334.56	157.43	84.98
48446	2015	5.10	351.63	165.47	89.32
48446	2016	6.10	373.08	175.56	94.76
48446	2017	6.74	398.23	187.39	101.15
48446	2018	5.96	421.96	198.56	107.18
48446	2019	5.74	446.17	209.95	113.33
48446	2020	4.99	468.43	220.43	118.98

We have presented the full repeat sales analysis on the following page.

Repeat Sales Analysis											48446 Zip Code - FHFA House Price Index Change			
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Year of Most Recent Sale	Prior Sale Year Index Level	Total Appreciation	Monthly Appreciation Rate
4	1168 Alice Drive	0.46	1,672	10/9/2019	\$176,000	12/8/2017	\$144,000	22.22%	22	0.92%	446.17	398.23	12.04%	0.52%
4	1168 Alice Drive	0.46	1,672	12/8/2017	\$144,000	10/1/1993	\$100,000	44.00%	290	0.13%	398.23	238.05	67.29%	0.18%
9	1126 Don Wayne Drive	0.50	1,900	5/21/2018	\$160,000	12/21/2007	\$119,000	34.45%	125	0.24%	446.17	418.17	6.70%	0.05%
10	1120 Don Wayne Drive	0.47	1,700	11/8/2019	\$194,000	10/15/2014	\$173,200	12.01%	61	0.19%	446.17	334.56	33.36%	0.47%
7	1138 Don Wayne Drive	0.47	2,128	9/7/2018	\$179,900	8/22/2014	\$148,500	21.14%	49	0.40%	446.17	334.56	33.36%	0.60%
7	1138 Don Wayne Drive	0.47	2,128	8/28/2019	\$191,000	9/7/2018	\$179,900	6.17%	12	0.51%	446.17	446.17	0.00%	0.00%
Median - Test Area Sales														0.33%
Median - Before/After														0.11%

Conclusion

When compared to the FHFA home price index for the local zip code, the median monthly appreciation rate of the sales of properties adjoining the Demille Solar Farm that sold before construction of the solar farm and again after construction of the solar farm outperformed the median for the zip code, as depicted in the far-right column in the table above (and highlighted in orange). Additionally, the extract appreciation rate for the resales of Adjoining Properties 4 and 7 that sold twice after the solar farm was constructed exhibited higher rates of appreciation than the Home Price Index for the zip code (highlighted in white). As such, we have concluded that there does not appear to be a consistent detrimental impact on properties adjacent to the Demille Solar Farm.

SOLAR FARM 4: RIVERSTART SOLAR FARM, RANDOLPH COUNTY, IN**Coordinates:** Latitude 40.046244, Longitude -85.04509**PINs:** Multiple**Total Land Size:** Approximately 1,500 acres**Population Density (2023):** 53 people per square mile (Randolph County)**Date Project Announced:** June 2020 (Phase I)**Date Project Completed:** Phase I - December 2021 (red outline),
Phase II - December 2024 (yellow outline)**Combined Output:** 300 MW AC (Phase I – 200 MW, Phase II – 100 MW)**Date Study Completed:** February 2023**Date Study Updated:** September 2025

Approximate Riverstart Solar arrays outlined in yellow, Phase I denoted by the red rectangle and Phase II denoted by the yellow rectangle, aerial imagery provided by Google Earth

The Riverstart Solar use is located in Randolph County, Indiana in between South Huntsville Road and West 600 South to the north, West 850 South to the south, State Road 1 to the west, and 200 West to the east. The first phase of the solar farm was developed by and is owned by EDP Renewables North America and Connor,

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Clark & Lunn Infrastructure while Indiana based Hoosier Energy, an electricity supply cooperative, has entered a 20-year power purchase agreement to purchase the solar farm's energy from Phase I and will use the energy to power communities throughout central and southern Indiana as well as southeastern Illinois. Amazon entered a 25-year power purchase agreement to be the sole offtaker of the energy generated from Phase II of the Riverstart Solar Project. Phase I of the solar farm (outlined in the red rectangle) went into operation in December 2021 while Phase II of the solar farm, located west of Phase I, went into operation in December 2024. Combined, the Riverstart Solar Farm generates 300 MW, enough to power the equivalent to the average consumption of more than 57,600 homes.

The Surrounding Area: The Riverstart Solar installation is located in Randolph County, between the towns of Modoc, to the west, and Lynn, to the east, in the south central portion of Randolph County, Indiana. Randolph County is located on the eastern side of Indiana, along the Indiana-Ohio border. The solar site is approximately 50 miles northwest of the City of Dayton, Ohio and 60 miles northeast of the City of Indianapolis, Indiana.

As of July 2025, the Riverstart Solar project is one of the 116 solar farms in Indiana and the sole solar farm located within Randolph County, Indiana. The Riverstart Solar project is the third largest solar farm in Indiana, following the Mammoth North Solar project, which produces an output of 400 MW and is located in Starke County and the Dunns Bridge Solar project, which produces an output of 700 MW and is located in Starke and Jasper County. There are currently three other solar farms in Indiana that produce an output of at least 200 MW, the 200 MW Indiana Crossroad Solar Park located in White County, the 200 MW Cavalry Solar Hybrid project located in White County, and the 250 MW Fairbanks Solar Project located in Sullivan County.

The Immediate Area: The solar farm is located in between South Huntsville Road and West 600 South to the north, West 850 South to the south, State Road 1 to the west, and 200 West to the east. The solar farm is immediately surrounded by primarily agricultural land as well as residential homestead property and the Headwaters Wind Farm project, a 400 MW wind farm consisting of 130 turbines.

Real Estate Tax Info: Prior to the development of the solar farm, the assessed value of the underlying land of Phase I was \$2,587,600 and participating landowners paid \$40,764 in real estate taxes. In 2022, after the completion of Phase I of the solar farm, the assessed value of the participating parcels increased 397.79 percent to \$12,880,700 and real estate taxes increased 340.86 percent to \$179,711.

As for the second phase Riverstart Solar project, prior to its development the assessed value of the underlying land was \$2,018,900 and paid \$26,035 in real estate taxes. In 2024, after the completion of Phase II of the solar farm, the assessed value of the participating parcels increased 211.66 percent to \$6,292,100 and real estate taxes increased 216.97 percent to \$82,525.

Riverstart Solar Phase I, Assessment and Tax Info:

Pin	Acres	2021 Taxes Paid	2022 Taxes Estimate*	Tax Increase	2021 Assessed Value	2022 Assessed Value*	Value Increase
Randolph County, IN							
68-14-28-100-003.000-011	52.9	\$643	\$6,665	937.16%	\$267,500	\$455,300	70.21%
68-14-27-200-005.000-011	93.6	\$1,321	\$12,255	827.37%	\$78,600	\$837,200	965.14%
68-14-27-500-006.000-011	50.0	\$617	\$4,552	638.00%	\$35,700	\$311,000	771.15%
68-14-27-100-009.000-011	52.9	\$627	\$7,468	1090.23%	\$36,000	\$510,200	1317.22%
68-14-27-100-010.000-011	80.0	\$1,454	\$4,753	226.91%	\$92,500	\$324,700	251.03%
68-14-26-200-001.000-011	78.7	\$916	\$9,140	897.32%	\$53,400	\$624,400	1069.29%
68-14-26-200-002.000-011	40.0	\$547	\$5,240	857.22%	\$31,200	\$358,000	1047.44%
68-14-23-300-012.000-011	40.0	\$866	\$2,996	245.77%	\$56,900	\$204,700	259.75%
68-14-26-300-006.000-011	39.7	\$532	\$5,227	881.97%	\$29,800	\$357,100	1098.32%
68-14-26-300-007.000-011	40.0	\$486	\$4,235	771.04%	\$26,500	\$289,300	991.70%
68-14-26-100-004.001-011	66.9	\$858	\$9,384	993.45%	\$47,500	\$641,100	1249.68%
68-14-26-100-004.000-011	93.1	\$3,110	\$6,873	120.97%	\$259,400	\$469,500	80.99%
68-14-25-200-002.002-016	117.4	\$3,699	\$11,637	214.58%	\$221,000	\$728,800	229.77%
68-14-25-200-004.000-016	40.0	\$984	\$3,119	217.01%	\$57,200	\$195,300	241.43%
68-14-25-300-005.000-016	60.0	\$1,276	\$5,025	293.90%	\$72,700	\$314,700	332.87%
68-14-25-100-003.000-016	130.0	\$6,028	\$22,224	268.69%	\$475,400	\$1,391,800	192.76%
68-14-25-100-012.000-016	30.0	\$658	\$4,779	625.76%	\$37,700	\$299,300	693.90%
68-14-25-400-006.001-016	31.7	\$284	\$4,610	1524.21%	\$26,100	\$288,700	1006.13%
68-14-25-400-006.002-016	45.5	\$277	\$5,075	1733.98%	\$28,700	\$317,800	1007.32%
68-14-25-400-009.000-016	69.2	\$1,543	\$4,849	214.25%	\$90,600	\$303,700	235.21%
68-14-26-300-012.000-011	39.0	\$356	\$4,267	1096.98%	\$19,300	\$291,500	1410.36%
68-14-26-300-011.000-011	40.0	\$615	\$4,024	553.93%	\$35,600	\$274,900	672.19%
68-14-27-400-022.000-011	39.4	\$506	\$5,257	938.97%	\$27,700	\$359,100	1196.39%
68-14-27-400-026.000-011	40.0	\$500	\$5,914	1082.94%	\$26,500	\$404,000	1424.53%
68-14-27-400-025.001-011	17.9	\$329	\$2,777	744.18%	\$20,400	\$189,700	829.90%
68-14-27-300-024.000-011	40.0	\$1,400	\$5,940	324.38%	\$92,400	\$405,800	339.18%
68-14-27-300-023.000-011	40.0	\$432	\$3,882	799.57%	\$24,200	\$265,200	995.87%
68-14-35-300-010.000-011	79.0	\$2,795	\$8,682	210.65%	\$59,600	\$593,100	895.13%
68-14-35-400-011.000-011	20.0	\$286	\$1,514	428.67%	\$16,300	\$103,400	534.36%
68-14-35-400-013.002-011	89.5	\$943	\$11,438	1112.89%	\$49,100	\$781,400	1491.45%
68-14-36-300-005.000-016	55.0	\$1,147	\$6,932	504.17%	\$65,200	\$434,100	565.80%
68-14-36-300-006.003-016	28.3	\$468	\$1,554	232.11%	\$23,400	\$97,300	315.81%
68-14-36-300-006.002-016	29.4	\$691	\$4,270	517.77%	\$38,200	\$267,400	600.00%
68-14-36-400-008.000-016	17.9	\$416	\$1,083	160.26%	\$23,200	\$67,800	192.24%
68-17-02-100-004.000-011	40.0	\$2,530	\$7,726	205.39%	\$259,100	\$527,800	103.71%
68-17-02-200-003.000-011	120.0	\$2,816	\$17,169	509.76%	\$175,100	\$1,172,900	569.85%
68-17-02-200-001.000-011	38.5	\$543	\$5,176	853.01%	\$30,800	\$353,600	1048.05%
Total	2025.6	\$40,293	\$206,771	413.16%	\$2,592,700	\$13,697,900	428.33%

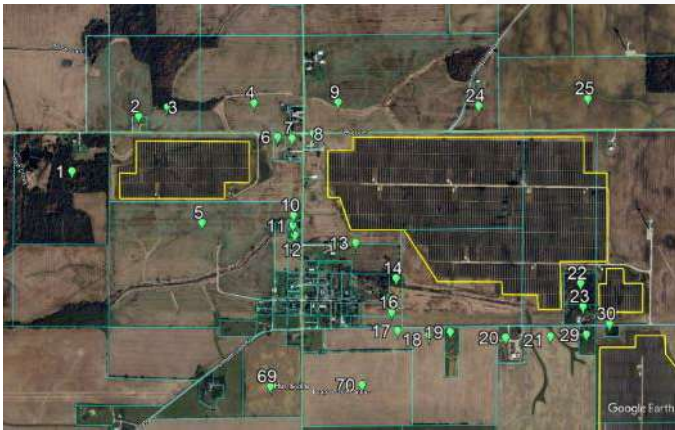
Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Riverstart Solar Phase II, Assessment and Tax Info:

Pin	Acres	2023 Taxes Paid	2024 Taxes	Tax Increase	2023 Assessed Value	2024 Assessed Value*	Value Increase
Randolph County, IN							
68-14-30-200-001.000-01	115.4	\$5,042	\$13,491	167.57%	\$393,500	\$1,047,800	166.28%
68-14-30-100-002.000-01	80.0	\$1,821	\$6,381	250.41%	\$142,100	\$495,600	248.77%
68-14-30-100-003.000-01	20.0	\$425	\$1,452	241.65%	\$33,200	\$112,800	239.76%
68-14-30-100-005.000-01	59.0	\$1,040	\$4,262	309.81%	\$81,200	\$331,000	307.64%
68-14-29-200-003.000-01	78.0	\$1,253	\$7,094	466.16%	\$97,800	\$551,000	463.39%
68-14-29-200-004.000-01	70.0	\$1,531	\$5,195	239.32%	\$119,500	\$332,000	177.82%
68-14-29-100-005.000-01	70.7	\$1,849	\$4,352	135.37%	\$144,300	\$338,000	134.23%
68-14-29-300-006.000-01	95.5	\$1,014	\$5,329	425.54%	\$79,100	\$413,900	423.26%
68-14-30-400-010.000-01	140.1	\$3,056	\$13,859	353.50%	\$238,500	\$1,076,400	351.32%
68-14-30-300-007.000-01	38.0	\$962	\$4,293	346.11%	\$75,100	\$333,400	343.94%
68-14-30-300-006.000-01	66.7	\$1,354	\$3,798	180.50%	\$92,700	\$282,000	204.21%
68-14-30-300-008.001-01	8.0	\$169	\$769	355.03%	\$13,200	\$59,700	352.27%
68-14-31-100-029.000-01	19.1	\$222	\$583	162.61%	\$17,300	\$45,300	161.85%
68-14-31-100-004.000-01	61.8	\$1,067	\$3,561	233.74%	\$83,300	\$276,600	232.05%
68-14-32-200-001.000-01	36.8	\$2,313	\$3,724	61.00%	\$180,500	\$289,200	60.22%
68-14-32-200-005.000-01	27.7	\$527	\$2,378	351.23%	\$41,100	\$184,700	349.39%
68-14-31-100-007.000-01	40.0	\$374	\$954	155.08%	\$29,200	\$74,100	153.77%
68-14-31-100-006.000-01	37.6	\$725	\$2,829	290.21%	\$56,600	\$219,700	288.16%
68-14-31-200-005.000-01	54.5	\$1,322	\$3,833	189.94%	\$103,200	\$264,800	156.59%
68-14-31-300-009.002-01	164.8	\$8,297	\$19,974	140.74%	\$647,500	\$1,551,300	139.58%
Total	1283.7	\$26,035	\$82,525	216.97%	\$2,018,900	\$6,292,100	211.66%

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The following maps display the parcels developed with the solar farm (outlined in yellow). Properties immediately adjoining the solar parcels (outlined in blue) are numbered for subsequent analysis. It is noted that the aerial imagery provided by Google Earth is dated April 2025.



Riverstart Solar – Adjoining Properties



Riverstart Solar – Adjoining Properties



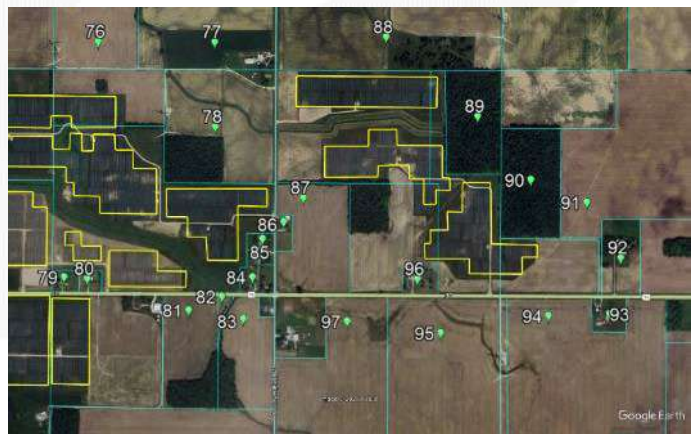
Riverstart Solar – Adjoining Properties



Riverstart Solar – Adjoining Properties



Riverstart Solar – Adjoining Properties



Riverstart Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Riverstart Solar – Adjoining Properties



Riverstart Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

PAIRED SALES ANALYSIS

We considered only one type of paired sales analysis, which was comparing sales of properties not proximate to the solar farm (Control Area Sales) to the sales of adjoining properties after the completion of the solar farm project (Test Area Sales). We analyzed sales of homes that occurred during the construction of Phase I of solar facility, between June 2020 and December 2021, and after the completion of the solar facility, starting in December 2021. Only one adjacent property sold since the completion of Phase I Riverstart Solar Project, Adjoining Property 27, which sold on February 17, 2022 for a consideration of \$250,000. There have been no adjacent properties to Phase II of the Riverstart Solar Project that have sold since it was completed in December 2024.

During the construction of Phase I of the Riverstart Solar project one adjacent property sold, Adjacent Property 86, which sold on December 28, 2020 for a consideration of \$200,000.

We identified Control Area Sale data through the RealQuest database which aggregates real estate sales from public record. We verified these sales through county records and conversations with brokers and sellers. We excluded sales that were not arm's length, such as REO sales or bank-owned properties, or those between related parties.

It is important to note that the Control Area Sales are not adjoining to any solar farm, nor do they have a view of one from the property. Therefore, the announcement nor the completion of the solar farm use could have impacted the sales price of these properties.

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 27 to the Riverstart Solar project was considered for a paired sales analysis, which sold for \$250,000 after being on the market for 45 days. The property is a one and a half-story, 2,457 square foot home with a partial unfinished basement, a detached garage, a barn and an outbuilding, located on a 3.00-acre lot and sold in February 2022. The improvements on this property are located approximately 700 feet to the nearest solar panel while the property line is approximately 225 feet to the nearest solar panel. Additionally, the improvements on this property are located approximately 1,400 feet to the nearest wind turbine. The table on the following page outlines the other important characteristics of Adjoining Property 27.



Adjoining Property 27, 3928 W. 600 S., Modoc IN, with Riverstart Solar and Headwater Wind Farm within viewshed

SUMMARY OF TEST AREA SALE										
Group 1 - Riverstart Solar										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
27	3928 W. 600 S., Modoc	\$250,000	5	2.0	1910	2,457	SFH with partial unfinished basement, detached garage, barn, and outbuilding	3.00	\$101.75	Feb-22

We analyzed six Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm or any wind turbines, that sold within a reasonable time frame from the sale date of the Test Area Sale. The Control Area Sales for Group 1 are one and one-half to two-story, single-family homes with three to four bedrooms and 1 to 2.5 baths, consist of between 1,700 square feet and 2,500 square feet of gross living area, and built between 1890 and 1927. The Control Area Sales also have farm structures, have an unfinished basement or no basement, and are located on lots between 1.00 and 6.50-acres in size. Additionally, these Control Area Sales are all located within a ten mile radius of the Riverstart Solar project.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

refinancing of the same properties. The result of our analysis for the Riverstart Solar Project – Group 1 is presented below.

CohnReznick Paired Sale Analysis Riverstart Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$101.75
Control Area Sales (6)	No: Not adjoining solar farm	\$99.55
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		2.21%

The marketing time (from list date to closing date) for Control Area Sales ranged from 52 to 160 days on market, and the marketing time for Adjoining Property 27 was 118 days, which is within the range of the Control Area Sales, **and we note no negative marketing time differential.**

The small differential between the Test Area Sale and the Control Area Sales is within the range of normal market variance, and therefore it does not appear that the Riverstart Solar installation impacted the sale price of the Test Area Sale.

We contacted the selling broker of the Test Area Sale home, Gary Coats of Wagner Auction & Real Estate, who indicated that proximity to the solar farm and wind turbines did not concern prospective buyers and the property attracted multiple offers while listed for sale.

Additionally, we spoke with George Caster, Randolph County Assessor, who stated that there has been no impact on property values due to their proximity to the Riverstart Solar project.

Group 2 – Improved Single-Family Residential Properties

Adjoining Property 86 to the Riverstart Solar project was considered for a paired sales analysis, which sold for \$200,000 after being on the market for 91 days. The property is a one-story, 1,899 square foot home with a two-car detached garage and an outbuilding/detached garage, located on a 2.00-acre lot and sold in December 2020. The improvements on this property are located approximately 260 feet to the nearest solar panel while the property line is approximately 140 feet to the nearest solar panel. Additionally, the improvements on this property are located approximately 1,800 feet to the nearest wind turbine. The table on the following page outlines the other important characteristics of Adjoining Property 86.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Adjoining Property 86, 7849 S. 300 W., Lynn IN, with Riverstart Solar (red stars) and Headwater Wind Farm (red arrows) within viewshed

SUMMARY OF TEST AREA SALE Group 2 - Riverstart Solar Farm									
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Date
86	7849 S. 300 W., Lynn	\$200,000	3	2.0	2003	1,899	1-Story SFH with 2-Car Attached Garage & Outbuilding/2-Car Detached Garage	2.00	Dec-20

We analyzed eight Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm or any wind turbines, that sold within a reasonable time frame from the sale date of the Test Area Sale. The Control Area Sales for Group 2 are one-story single-family homes with three bedrooms and two baths, consist of between 1,400 square feet and 2,400 square feet of gross living area, and built between 1993 and 2013. The Control Area Sales also do not have a basement, and are located on lots between 1.00 and 4.00-acres in size. Additionally, these Control Area Sales are all located within a twenty mile radius of the Riverstart Solar project.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Riverstart Solar Project – Group 2 is presented below.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis Riverstart Solar Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price PSF
Test Area Sale (1)	Adjoining solar farm	\$105.32
Control Area Sales (8)	No: Not adjoining solar farm	\$104.08
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		1.19%

The small differential between the Test Area Sale and the Control Area Sales is within the range of normal market variance, and therefore it does not appear that the Riverstart Solar installation impacted the sale price of the Test Area Sale.

As previously noted, we spoke with George Caster, Randolph County Assessor, who stated that there has been no impact on property values due to their proximity to the **Riverstart Solar** project.

BEFORE & AFTER ANALYSIS – RIVERSTART SOLAR PROJECT

We note the Test Area Sale of the Riverstart Solar project (Adjoining Property 27) as well as three control sales (Control Sales 1, 2 and 5) have sold at least twice over the past 15 years. To determine if any of the rates of appreciation for these identified home sales were affected by the proximity to the Riverstart Solar project, we prepared a Repeat-Sales Analysis on each identified property. First, we calculated the total appreciation between each sale of the same property, the number of months that elapsed between each sale, and determined the monthly appreciation rate. Then, we compared extracted appreciation rates reflected in the Federal Housing Finance Agency (FHFA) Home Price Index for Indiana's 473 three-digit zip code (where the identified homes are located) over the same period. The index for three-digit zip codes is measured on a quarterly basis and is presented below.

473 Three-Digit Zip Code - Housing Price Index Change (Quarter over Quarter) Not Seasonally Adjusted			
Three-Digit Zip Code	Year	Quarter	HPI
473	2017	1	152.38
473	2017	2	151.03
473	2017	3	156.31
473	2017	4	155.79
473	2018	1	157.53
473	2018	2	158.44
473	2018	3	160.89
473	2018	4	162.69
473	2019	1	165.10
473	2019	2	167.44
473	2019	3	168.49
473	2019	4	173.74
473	2020	1	173.68
473	2020	2	175.55
473	2020	3	173.68
473	2020	4	183.84
473	2021	1	188.41
473	2021	2	198.62
473	2021	3	205.71
473	2021	4	216.01
473	2022	1	217.68
473	2022	2	231.02
473	2022	3	236.76

We have presented the full repeat sales analysis on the following page.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Repeat Sales Analysis										473 Three-Digit Zip Code - FHFA House Price Index Change			
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Quarter of Most Recent Sale	Prior Sale Quarter Index Level	Monthly Appreciation Rate
27	3928 W. 600 S., Modoc	3.00	2,457	2/17/2022	\$250,000	2/25/2021	\$219,000	14.16%	12	1.14%	217.68	188.41	1.24%
27	3928 W. 600 S., Modoc	3.00	2,457	2/25/2021	\$219,000	7/2/2020	\$180,000	21.67%	8	2.54%	188.41	178.86	0.67%
	Median - Test Area Sales	3.00	2,457							1.84%			0.95%

Repeat Sales Analysis										473 Three-Digit Zip Code - FHFA Housing Price Index Change			
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Quarter of Most Recent Sale	Prior Sale Quarter Index Level	Monthly Appreciation Rate
1	757 W. 250 N., Winchester	4.55	2,066	5/24/2022	\$195,000	10/6/2018	\$135,000	44.44%	44	0.85%	231.02	162.69	0.81%
2	3611 N. US Highway 27, Winchester	2.44	1,756	8/26/2022	\$232,565	11/7/2017	\$155,000	50.04%	58	0.71%	236.76	155.79	0.73%
5	6290 N. US Highway 35, Williamsburg	6.47	2,024	8/16/2022	\$210,187	6/5/2018	\$134,000	56.86%	50	0.90%	236.76	160.89	0.77%
	Median - Control Area Sales	4.55	2,024							0.85%			0.77%

Conclusion

In our analysis of the two resales of homes adjacent to the Riverstart Solar project and the three resales of homes in the surrounding area, when compared to the FHFA home price index for the local zip code, the median monthly appreciation rate of the Test Area Sales group outperformed the average for the zip code and outperformed the median monthly appreciation rate of the Control Area Sales, as depicted by the far-right column in the tables above. As such, we have concluded that there does not appear to be a consistent detrimental impact on properties adjacent to the Riverstart Solar project.

We spoke with Gary Coats of Wagner Auction & Real Estate, who was the selling broker of the February 2022, 3928 W. 600 S. Modoc sale, and indicated that there were no major capital improvements made to the property prior to the February 2021 or February 2022 sale. Mr. Coats also noted that the frequency of transfers of the property was due to personal reasons by the sellers, who were clients of his.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

SOLAR FARM 5: HILLCREST SOLAR FARM, BROWN COUNTY, OH**Coordinates:** Latitude 39.076972, Longitude -83.90605**PINs:** Multiple**Population Density (2023):** 88 people per square mile (Brown County)**Total Land Size:** Approximately 1,940 acres**Date Project Announced:** February 2018**Date Project Completed:** May 2021**Output:** 200 MW AC**Date Study Completed:** July 2023 **Date Study Updated:** September 2025

Approximate Hillcrest Solar boundaries outlined in yellow, aerial imagery provided by Google Earth dated March 2021

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The Hillcrest Solar use is located in Brown County, Ohio and in between Upper 5 Mile East Road to the north, Greenbush East Road to the south, U.S. Route 68 to the west and County Road 182 ("Beltz Road") to the east.

The current owner of the solar farm is Innergex Renewable Energy Incorporated while Open Road Renewables, LLC and Eolian began the initial development of the solar facility. Amazon.com, Incorporated has entered a power purchase agreement to purchase 100 percent of the solar farm's energy. The solar farm went into operation in May 2021 and can generate power for approximately 39,000 homes. Nearly 606,000 panels comprise the farm.

The Surrounding Area: The Hillcrest Solar installation is located in northern Brown County, Ohio, adjacent to U.S. Route 68 to the west and approximately 30 miles east of the Cincinnati, in the southern portion of Ohio. Brown County is located on the northern side of the Ohio River, along the Ohio-Kentucky border. The solar site is approximately 45 miles southeast of the City of Dayton, 75 miles southwest of the City of Columbus and 75 miles northeast of the City of Lexington, Kentucky.

As of July 2025, per the U.S. Energy Information Administration, the Hillcrest Solar project is one of the 70 solar farms in Ohio and the sole solar farm located within Brown County, Ohio. The Hillcrest Solar project is the fifth largest solar farm in Ohio with the largest being the 577 MW Fox Squirrel Solar Project which became operational in December 2023 and is located in Madison County.

The Immediate Area: The solar farm spans over 1,900 acres in Brown County and is immediately surrounded by primarily agricultural land with residential homestead properties interspersed throughout the surrounding Project area. To the northeast lies more densely concentrated residential and commercial properties in the City of Hillsboro, approximately 15 miles from the Project site.

Real Estate Tax Info: In lieu of paying taxes for utility scale solar projects in Ohio, utility scale solar projects are allowed to utilize real and personal property tax abatement and instead make a payment based on the size of the solar farm, often referred to as the PILOT framework (payment in lieu of taxes). For utility scale solar projects in Ohio, the PILOT is \$7,000 per megawatt, however, it has been reported that Hillcrest Solar is paying approximately \$1.8 million annually to Brown County, Western Brown School District and Green Township.

The following maps display the parcels developed with the solar farm (outlined in yellow). Properties immediately adjoining the solar parcels (outlined in blue) are numbered for subsequent analysis. It is noted that the aerial imagery provided by Google Earth is dated March 2021.



Hillcrest Solar – Adjoining Properties



Hillcrest Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar – Adjoining Properties



Hillcrest Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar – Adjoining Properties



Hillcrest Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

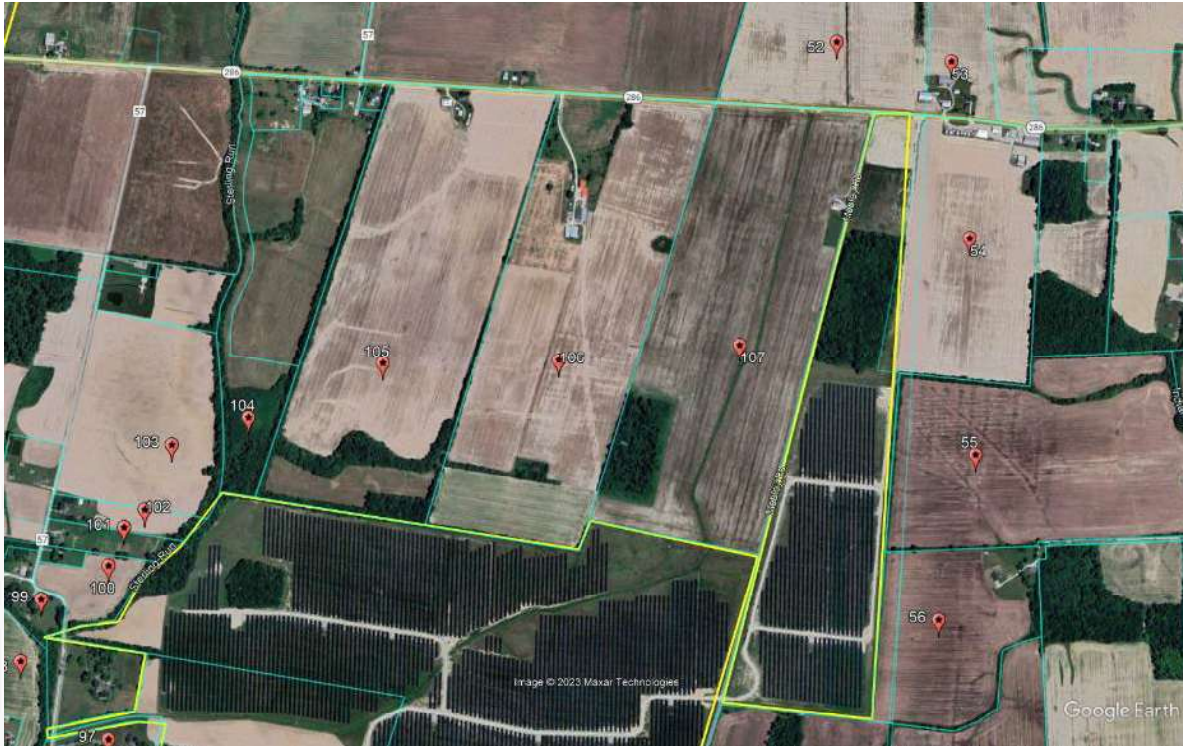


Hillcrest Solar – Adjoining Properties



Hillcrest Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar – Adjoining Properties



Hillcrest Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar – Adjoining Properties



Hillcrest Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

PAIRED SALES ANALYSIS

In reviewing Adjoining Properties to study in a Paired Sales Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

One adjoining residential property consisting of two adjoining parcels, Adjoining Properties 60 and 61, was sold on July 28, 2022 for \$167,500 or \$122.44 per square foot of living area, after being on the market for 44 days. Adjoining Properties 60 and 61 are comprised of a 1-Story single family home with an enclosed porch built in 1990 on a 20.77-acre lot. We have not included the sale of Adjoining Properties 60 and 61 due to a lack of comparable transactions of single-family homes on large lots without garage parking or any other improvements. However, we spoke to the selling broker, Ragan McKinney of Ragan McKinney Real Estate, **who noted the property attracted multiple offers and that the presence of the solar farm did not impact the final sale price.**

Additionally, we have not included the sale of Adjoining Property 63, which sold for \$125,000 or \$71.35 per square foot of living area, in our analysis due to a lack of comparable transaction in the local market. Adjoining Property 63 consists of a 1.5-story SFH constructed in the early 1900's with a small storage shed on a 1.55-acre lot. We have not included the sale of Adjoining Property 63 due to the lack of comparable transactions of single-family homes of similar age without garage parking on similarly sized lots. Ragan McKinney of Ragan McKinney Real Estate was also the selling broker of Adjoining Property 63 and she noted that after multiple viewings, **Adjoining Property 63 received multiple offers, the buyers did not receive any concessions due to the presence of the solar farm and that other potential buyers were not concerned about the presence of the adjacent Hillcrest Solar Farm.**

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 85 to the Hillcrest Solar Project was considered for a paired sales analysis, and we have analyzed this property as a single-family home use in Group 1. The property is a single-story, 1,758 square foot home with a full unfinished basement, attached garage, workshop, pole barn and a carport, located on a 17.87-acre lot that sold in June 2023. This property line is approximately 225 feet from the closest solar panel, and the improvements are approximately 330 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 85.

SUMMARY OF TEST AREA SALE										
Group 1 - Hillcrest Solar										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
85	16011 Moon Road	\$374,500	3	1.5	Early 1900's	1,758	1-Story SFH with Detached Garage, Full Basement, Workshop, Pole Barn and Carport	17.87	\$213.03	Jun-23

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar Farm – Test Area Sale Map, Group 1

We analyzed eleven Control Area Sales of single-family homes with similar construction and use that were located within the Western Brown Local School District or in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 1. The Control Area Sales for Group 1 are single-family homes located on lots in between 10.00 and 28.36-acres in size with three to four bedrooms and one to four baths, consisting of between 1,260 square feet and 2,613 square feet of gross living area, and built between 1900 and 1999. The Control Area Sales also have additional improvements such as garage parking, pole barns, workshops or storage sheds.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Hillcrest Solar Project – Group 1 is presented below.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis Hillcrest Solar Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$213.03
Control Area Sales (11)	No: Not adjoining solar farm	\$200.96
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		6.00%

Noting no negative marketing time differential, Adjoining Property 85 sold in 28 days, while the Control Area Sales sold between 35 and 185 days, with a median time on market of 41 days.

Noting no negative price differential, with Adjoining Property 85 having a higher unit sale price than the Control Area Sales, it does not appear that the Hillcrest Solar Farm had any negative impact on the sale of the Test Area Sale.

Group 2 – Improved Single-Family Residential Properties

Adjoining Property 92 to the Hillcrest Solar project was considered for a paired sales analysis, and we have analyzed this property as a single-family home use in Group 2. The property is a single-story, 1,776 square foot home in fair condition that sold in need of repairs with a detached pole barn/garage, located on a 4.45-acre lot and sold in December 2022. The improvements on this property is located approximately 265 feet to the nearest solar panel while the property line is approximately 105 feet to the nearest solar panel. The following table outlines the other important characteristics of Adjoining Property 92.

SUMMARY OF TEST AREA SALE										
Group 2 - Hillcrest Solar										
Adj .Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
92	16103 Moon Road	\$168,900	3	1.0	1971	1,776	1-Story SFH with Detached Garage/Pole Barn	4.45	\$95.10	Dec-22

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar Farm – Test Area Sale Map, Group 2

We analyzed six Control Area Sales of single-family homes with similar construction and use that were located within the Western Brown Local School District or in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 2. The Control Area Sales for Group 2 are single-family homes located on lots in between 2.00 and 7.58-acres in size with two to three bedrooms and two to three baths, consisting of between 1,080 square feet and 2,080 square feet of gross living area, and built between 1970 and 1986. The Control Area Sales also have additional improvements such as garage parking, pole barns or storage sheds. Additionally, all of the Control Area Sales were in poor to fair condition and in need of repairs at the time of sale.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Hillcrest Solar Project – Group 2 is presented below.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis Hillcrest Solar Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$95.10
Control Area Sales (6)	No: Not adjoining solar farm	\$98.52
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		-3.47%

The marketing time (from list date to closing date) for Control Area Sales ranged from 41 to 306 days on market with a median of 79 days on market, and the marketing time for Adjoining Property 92 was 26 days, which is below the range of the Control Area Sales, **and we note no significant marketing time differential.**

Noting minimal negative price differential, it does not appear that the Hillcrest Solar Farm use impacted the sale of the Test Area Sale, Adjoining Property 92. This was confirmed by the listing agent who marketed and sold Adjoining Property 92, Pam Shipley of Wyndham-Lyons Realty Services, who stated, **"The property received multiple offers and the solar farm had no impact on the value of the property."**

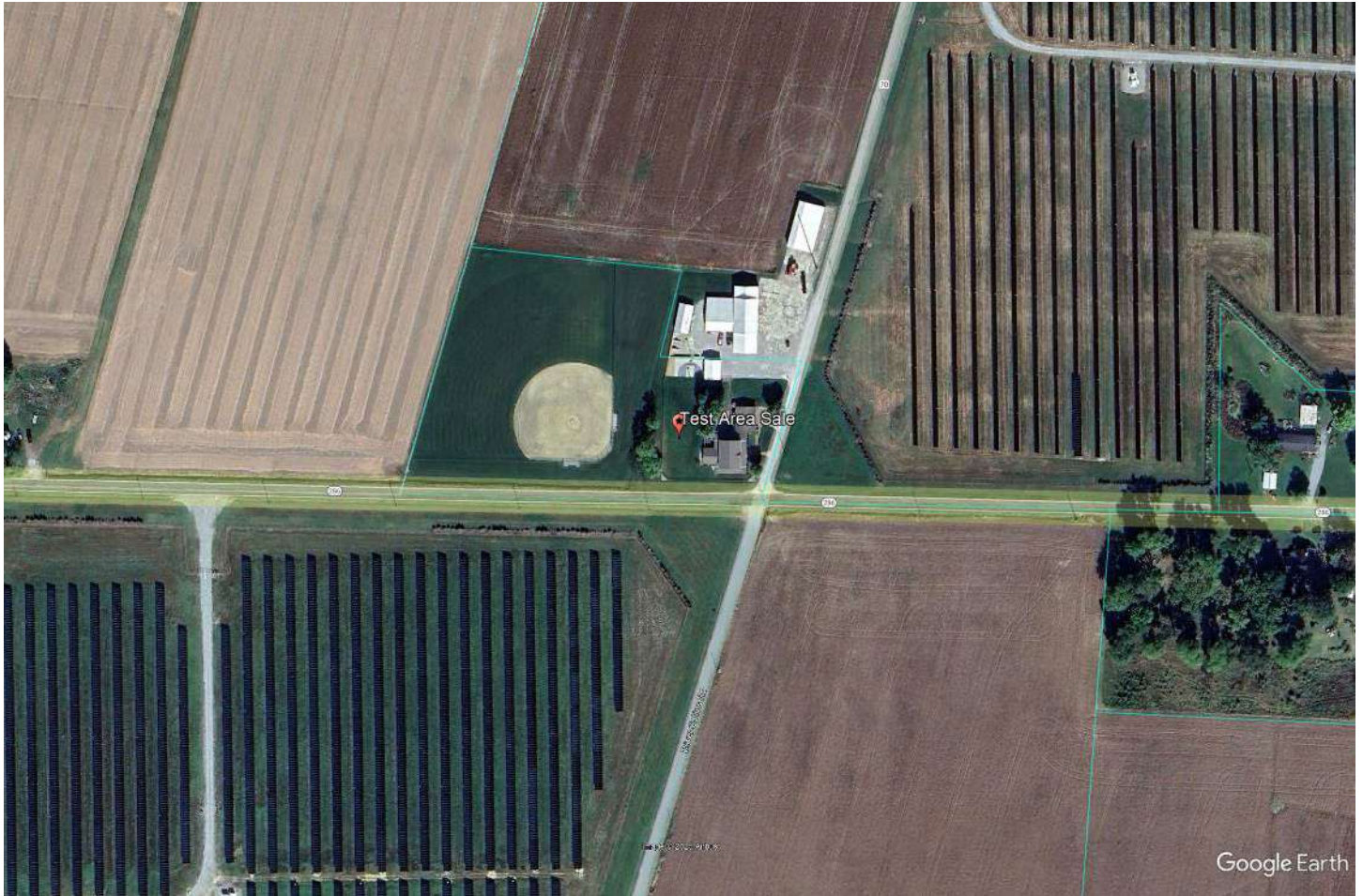
We note that the control data had additional improvements including garage parking, pole barns or storage sheds, which likely explains the relative difference in adjusted median price per square foot.

Group 3 – Improved Single-Family Residential Properties

Adjoining Property 145 to the Hillcrest Solar project was considered for a paired sales analysis, and we have analyzed this property as a single-family home use in Group 3. The property is a two-story, 4,800 square foot home with a three car attached garage, finished basement, workshop, sport court and baseball field, located on a 4.30-acre lot and sold in December 2023. The improvements on this property is located approximately 185 feet to the nearest solar panel while the property line is approximately 105 feet to the nearest solar panel. The following table outlines the other important characteristics of Adjoining Property 145.

SUMMARY OF TEST AREA SALE Group 3 - Hillcrest Solar										
Adj .Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
145	4437 State Route 285	\$600,000	4	4.5	2000	4,800	2-Story SFH with 3-Car Attached Garage, Finished Basement, Workshop, Sport Court & Baseball Field	4.30	\$125.00	Dec-23

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar Farm – Test Area Sale Map, Group 3

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar Farm – Test Area Sale Map, Group 3

We analyzed six Control Area Sales of single-family homes with similar construction and use that were located within the Western Brown Local School District or in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 3. The Control Area Sales for Group 3 are single-family homes located on lots in between 4.00 and 7.00-acres in size with three to five bedrooms and three to four baths, consisting of between 3,664 square feet and 5,040 square feet of gross living area, and built between 1999 and 2003. The Control Area Sales also have additional improvements such as finished basements and garage parking.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Hillcrest Solar Project – Group 3 is presented below.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis Hillcrest Solar Group 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$125.00
Control Area Sales (6)	No: Not adjoining solar farm	\$117.45
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		6.43%

The marketing time (from list date to closing date) for Control Area Sales ranged from 38 to 147 days on market, and the marketing time for Adjoining Property 145 was 139 days, which is within the range of the Control Area Sales, **and we note no negative marketing time differential.**

Noting no negative price differential. it does not appear that the Hillcrest Solar Farm use impacted the sale of the Test Area Sale, Adjoining Property 145.

Group 4 – Improved Single-Family Residential Properties

Adjoining Property 31 to the Hillcrest Solar project was considered for a paired sales analysis, and we have analyzed this property as a single-family home use in Group 4. The property is a one-story, 1,670 square foot home with a three car detached garage/pole barn and a storage shed, located on a 2.64-acre lot and sold in July 2024. The improvements on this property is located approximately 805 feet to the nearest solar panel while the property line is approximately 980 feet to the nearest solar panel. The following table outlines the other important characteristics of Adjoining Property 31.

SUMMARY OF TEST AREA SALE Group 4 - Hillcrest Solar										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
31	16606 Clements Road	\$328,000	4	2.0	1979	1,670	One-Story SFH with 3-Car Detached Garage/Pole Barn and Storage Shed	2.64	\$196.41	Jul-24

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Hillcrest Solar Farm – Test Area Sale Map, Group 4

We analyzed six Control Area Sales of single-family homes with similar construction and use that were located within the Western Brown Local School District or in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 4. The Control Area Sales for Group 4 are single-family homes located on lots in between 1.15 and 7.50-acres in size with three to four bedrooms and two baths, consisting of between 1,200 square feet and 1,900 square feet of gross living area, and built between 1972 and 1992. The Control Area Sales also have garage parking and do not have basements.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Hillcrest Solar Project – Group 4 is presented below.

CohnReznick Paired Sale Analysis Hillcrest Solar Group 4		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$196.41
Control Area Sales (11)	No: Not adjoining solar farm	\$185.40
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		5.94%

The marketing time (from list date to closing date) for Control Area Sales ranged from 33 to 204 days on market, with a median of 52 days on market. The marketing time for Adjoining Property 31 was 57 days, which is within the range of the Control Area Sales, **and we note minimal marketing time differential.**

Noting no negative price differential, it does not appear that the Hillcrest Solar Farm use impacted the sale of the Test Area Sale, Adjoining Property 31.

BEFORE & AFTER ANALYSIS – HILLCREST SOLAR PROJECT

We note one of the Test Area Sales of the Hillcrest Solar project (Adjoining Property 31, Group 4) as well as eleven Control Area Sales have sold at least twice over the past 15 years. To determine if any of the rates of appreciation for these identified home sales were affected by the proximity to the Hillcrest Solar project, we prepared a Repeat-Sales Analysis on each identified property. First, we calculated the total appreciation between each sale of the same property, the number of months that elapsed between each sale, and determined the monthly appreciation rate. Then, we compared extracted appreciation rates reflected in the Federal Housing Finance Agency (FHFA) Home Price Index for Ohio's 451 three-digit zip code (where the identified homes are located) over the same period. The index for three-digit zip codes is measured on a quarterly basis and is presented below.

451 Three-Digit Zip Code - Housing Price Index Change (Quarter over Quarter) Not Seasonally Adjusted			
Three-Digit Zip Code	Year	Quarter	HPI
451	2017	1	158.21
451	2017	2	161.51
451	2017	3	165.56
451	2017	4	166.24
451	2018	1	169.27
451	2018	2	172.85
451	2018	3	172.78
451	2018	4	174.73
451	2019	1	176.32
451	2019	2	180.07
451	2019	3	182.4
451	2019	4	183.82
451	2020	1	188.25
451	2020	2	190.31
451	2020	3	192.71
451	2020	4	197.87
451	2021	1	202.55
451	2021	2	213.01
451	2021	3	224.62
451	2021	4	228.42
451	2022	1	238.73
451	2022	2	258.97
451	2022	3	257.36
451	2022	4	257.65
451	2023	1	257.02
451	2023	2	275.86
451	2023	3	279.77
451	2023	4	277.02
451	2024	1	282.91
451	2024	2	291.39
451	2024	3	305.32
451	2024	4	300.25
451	2025	1	308.81

We have presented the full repeat sales analysis on the following page.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Repeat Sales Analysis										451 Three-Digit Zip Code - FHFA House Price Index Change			
Property ID Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Quarter of Most Recent Sale	Prior Sale Quarter Index Level	Total Appreciation	Monthly Appreciation Rate
31 - G4-T1 16905 Clements Road	2.64	1,670	7/26/2024	\$328,000	6/9/2020	\$180,000	82.22%	50	1.22%	305.32	190.31	60.43%	0.96%
Median - Test Area Sales	2.64	2,457							1.22%				0.96%

Repeat Sales Analysis										451 Three-Digit Zip Code - FHFA Housing Price Index Change			
Property ID Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Quarter of Most Recent Sale	Prior Sale Quarter Index Level	Total Appreciation	Monthly Appreciation Rate
G1-C1 8382 Scofield Road	28.36	2,160	5/1/2023	\$435,000	11/30/2022	\$395,000	10.13%	5	1.95%	275.86	257.65	7.07%	1.38%
G1-C9 9616 Russeville Amheim Road	10.01	1,350	5/3/2022	\$272,000	4/14/2020	\$185,000	47.03%	25	1.58%	258.97	190.31	36.08%	1.26%
G3-C2 3153 Old State Road	5.78	3,664	9/20/2024	\$425,000	12/13/2019	\$299,750	41.78%	57	0.61%	305.32	183.82	66.10%	0.89%
G3-C5 6029 State Route 505	5.00	4,056	10/16/2022	\$385,000	8/25/2020	\$270,000	42.59%	26	1.39%	257.65	192.71	33.70%	1.14%
G3-C6 5115 Schwallie Road	5.08	4,252	9/26/2022	\$600,000	1/9/2020	\$330,000	81.82%	33	1.85%	257.36	188.25	36.71%	0.97%
G4-C3 10654 Drake Road	2.51	1,530	6/6/2025	\$280,000	8/12/2021	\$194,000	44.33%	46	0.80%	308.81	202.55	52.46%	0.93%
G4-C4 1580 Friendly Lane	1.31	1,740	5/26/2025	\$308,000	2/17/2022	\$215,000	43.26%	39	0.92%	308.81	202.55	52.46%	1.08%
G4-C5 2784 Bardwell West Road	7.08	1,347	5/23/2025	\$285,000	9/8/2021	\$250,000	14.00%	44	0.30%	308.81	224.62	37.48%	0.72%
G4-C6 10984 Stratton Road	1.66	1,200	11/7/2024	\$300,000	5/17/2022	\$210,000	42.86%	30	1.21%	300.25	258.97	15.94%	0.50%
G4-C9 14754 Lindsey Road	5.76	1,404	10/16/2023	\$215,000	5/19/2021	\$169,900	26.55%	29	0.82%	277.02	213.01	30.05%	0.91%
G4-C11 11267 Smoky Row Road	1.97	1,200	3/30/2023	\$200,000	5/11/2017	\$118,500	68.78%	71	0.74%	257.02	161.51	59.14%	0.66%
Median - Control Area Sales	5.08	1,530							0.92%				0.93%

Conclusion

In our analysis of the one resale of a home adjacent to the Hillcrest Solar project and the eleven resales of homes in the surrounding area, when compared to the FHFA home price index for the local zip code, the median monthly appreciation rate of the Test Area Sales group outperformed the average for the zip code and outperformed the median monthly appreciation rate of the Control Area Sales, as depicted by the far-right column in the tables above. As such, we have concluded that there does not appear to be a consistent detrimental impact on properties adjacent to the Hillcrest Solar project.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

SOLAR FARM 6: NORTH STAR SOLAR FARM, CHISAGO COUNTY, MINNESOTA**Coordinates:** Latitude 45.486756, Longitude -92.884206**PINs:** Multiple**Population Density (2020) Chisago County:** 136 people per square mile
(Largest City = North Branch)**Total Land Size:** ±1,000 Acres**Date Project Announced:** 2014**Date Project Completed:** October 2016**Output:** 100 MW AC**Date Study Completed:** February 2021**Date Study Updated:** November 2023**Overview and Surrounding Area:**

The North Star Solar Farm is located approximately four miles southeast of the City of North Branch in unincorporated Chisago County, near the intersection of Route 69 and Route 72. The solar farm was developed by Community Energy Solar in 2016 and is the largest solar farm in the Midwest. The solar farm features 440,000

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

solar panels and a power output capacity of 100 MW AC, which is enough to power 20,000 homes. The owner, North Star, LLC, has a 25-year purchase contract for the power produced by the project with Xcel Energy.

Chisago County lies on Minnesota's eastern border, abutting the western border of Wisconsin, across the Saint Croix River. The North Star Solar Farm is approximately 16 miles west of the border with Wisconsin and is just over one mile west of the Kost Dam public park and reservoir, a 28-acre park on the south branch of the Sunrise River.

The Immediate Area:

The North Star Solar Farm is adjoined by agricultural land to the north and west. To the south and east of the project there are several residential properties, including some located within the actual solar farm. The solar farm has agricultural and deer fencing around parts of the project. Additionally, native vegetation and trees previously existed as a buffer along the frontage roads.

Prior Use: Agricultural use

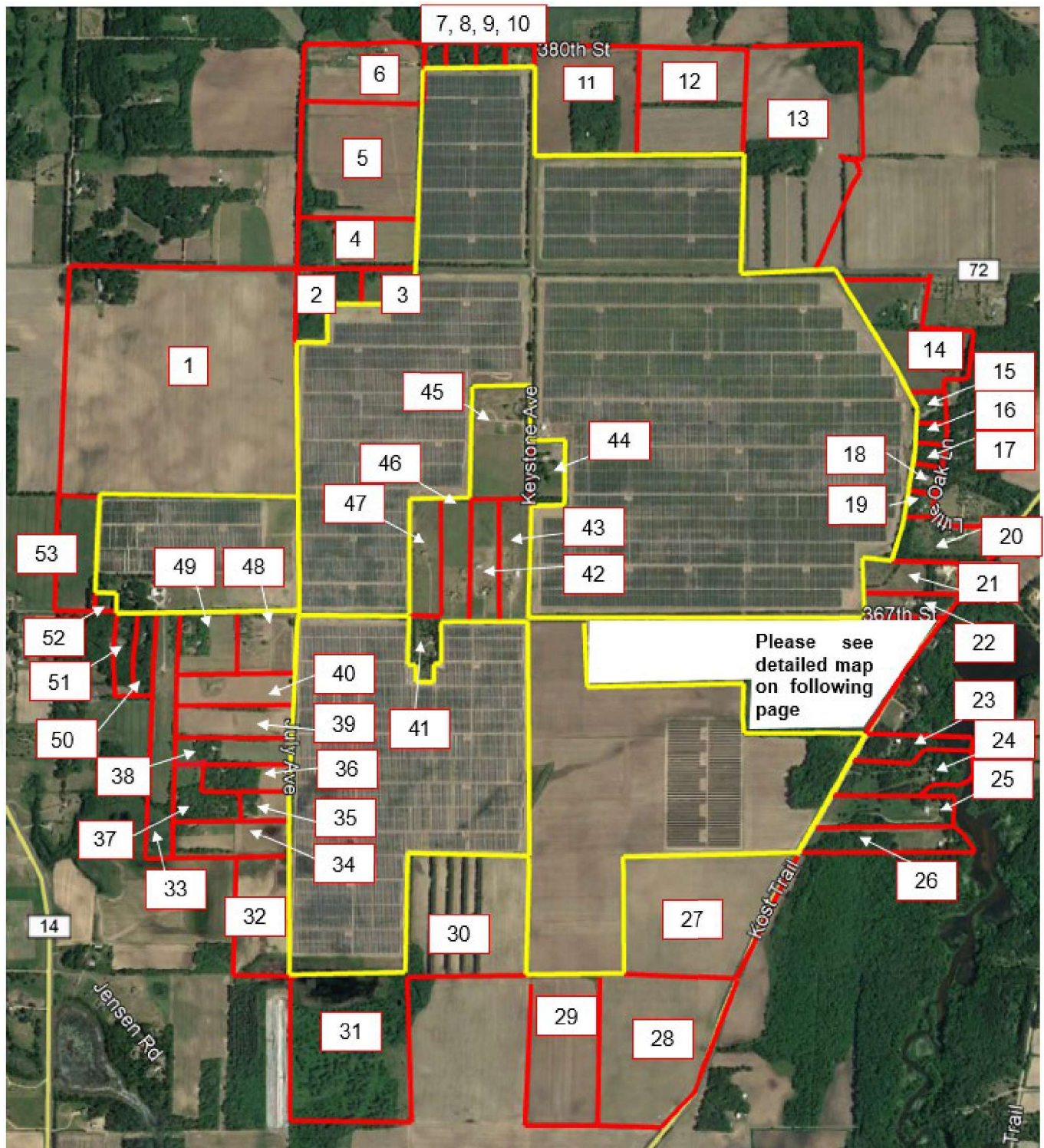
Real Estate Tax Information:

Prior to development of the solar farm, in 2015, this ±1,000-acre site paid real estate taxes of \$37,250, annually. After the solar farm development, in 2017, real estate taxes increased to \$112,856, a 203 percent increase in tax revenue for the site.

PIN	Acres	2015 Taxes Paid	2017 Taxes Paid	Tax Increase	2015 Assessed Value	2017 Assessed Value	Value Increase
Chisago County, MN							
09.00348.00	74.91	\$ 2,806	\$ 8,546	205%	\$ 198,800	\$ 233,900	18%
09.00349.00	74.30	\$ 2,818	\$ 8,578	204%	\$ 199,600	\$ 234,800	18%
09.00350.10	16.95	\$ 644	\$ 2,752	327%	\$ 45,600	\$ 75,300	65%
09.00351.10	68.01	\$ 3,260	\$ 9,806	201%	\$ 230,900	\$ 268,400	16%
09.00353.00	81.87	\$ 3,114	\$ 8,678	179%	\$ 220,500	\$ 237,500	8%
09.00354.00	121.84	\$ 4,578	\$ 13,324	191%	\$ 324,200	\$ 364,700	12%
11.00517.00	72.07	\$ 3,382	\$ 7,440	120%	\$ 194,400	\$ 224,100	15%
11.00528.00	66.42	\$ 1,460	\$ 6,836	368%	\$ 180,000	\$ 210,000	17%
11.00529.00	60.26	\$ 1,506	\$ 7,284	384%	\$ 168,700	\$ 168,800	0%
11.00726.00	40.55	\$ 1,010	\$ 3,968	293%	\$ 110,700	\$ 140,700	27%
11.00730.00	68.32	\$ 3,426	\$ 7,638	123%	\$ 315,700	\$ 338,200	7%
11.00731.00	160.83	\$ 3,598	\$ 17,924	398%	\$ 422,500	\$ 469,100	11%
11.00732.00	30.52	\$ 788	\$ 4,748	503%	\$ 84,900	\$ 109,500	29%
11.00732.10	10.00	\$ 4,860	\$ 5,334	10%	\$ 257,700	\$ 290,100	13%
TOTAL	946.85	\$ 37,250	\$ 112,856	203%	\$ 2,954,200	\$ 3,365,100	14%

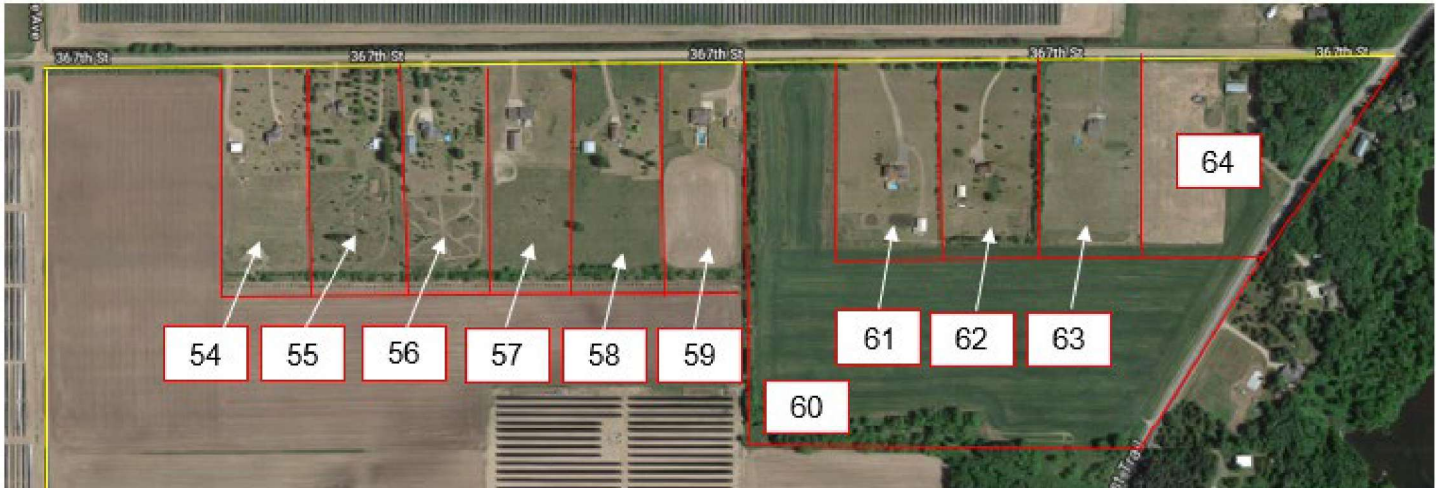
Adjoining Properties:

The maps on the following pages display the parcels that contain the solar farm (outlined in yellow). Properties adjoining the solar site (outlined in red) are numbered for subsequent analysis.



North Star Solar Farm - Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



North Star Solar Farm - Adjoining Properties

In reviewing Adjoining Properties to study in a Paired Sales Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

While assembling the solar development site, the developer of the solar farm acquired seven homes along 367th Street and Keystone Avenue, which we refer to as Adjoining Properties 41, 42, 43, 44, 45, 46, and 47, and are surrounded by the solar arrays. According to conversations with the solar developer, they purchased the homes prior to development to provide interim housing for employees as the solar farm was under construction or for potential use for the project area (which ultimately was not necessary). The developer had each home appraised, and then negotiated separately with each homeowner. All of the houses sold above their appraised values, which the developer considered to be an assemblage premium. After construction, the developer sold all seven homes at market prices, six to new buyers, and one, Adjoining Property 47, which was re-purchased by the original owner. Over a year later, these subsequent sales from the developer to individual homeowners were still higher than the originally appraised values. This indicates that the development of the North Star Solar Farm did not deter transactions nor affect sale prices in the surrounding area.

Clifford Sheppeck, broker at Keller Williams Classic, was hired by Renewable Energy Asset Co, LLC, the solar farm developer, to market and sell the remaining properties that the developer owned. We discussed these transactions with Mr. Sheppeck who indicated they all sold within two months, which was in line with the market.

In addition to the seven homes sold by the developer, we identified six other properties all which sold since the construction of the solar farm: Adjoining Properties 3, 10, 18, 19, 22, 38, 54, 57 and 64. In all, a total of 16 identified Adjoining Properties have sold during or since the construction of the solar farm. These properties are discussed further in the following sections.

Properties Excluded from Paired Sales Analysis

Adjoining Property 10, located at 10270 380th Street, sold in June 2018 for \$163,800, or \$143.18 per square foot of finished living area. The property is improved with a small, single-story, modular/pre-fabricated home with no basement, which is atypical for the area. Most of the homes in the area, while similar in gross living areas, are one-story, single-family homes with finished basements. We conducted a search in the area for comparable

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

modular homes without basements but did not find sufficient data yield reliable conclusions in a paired sale analysis. Additionally, this home does not appear to have been listed on the local MLS as we could not identify a broker contact for the most recent sale. We have reached out to the buyer and seller to confirm the nature of the transaction, but as of this writing, we have not made contact. We note that the home sold previously in July 2004; however, county sale records indicate the 2004 sale was between related parties which disqualifies it as an arm's length transaction. Due to limited sales in the area to categorize as Control Area Sales, Adjoining Property 10 was excluded from further analysis.

Adjoining Property 38, located at 36438 July Avenue, sold during construction of the solar farm in October 2015 for \$225,000, or \$117.68 per square foot of finished living area. It is a home designed specifically as a passive solar home, taking advantage of the same renewable energy potential of the North Star solar farm. The property is set back behind five acres of agricultural land and is secluded behind trees and operates as a mixed-use "hobby farm." This is a highly atypical use with no comparable sales which sold during construction; we have excluded the 2015 sale from paired sale analysis because we cannot separate any influence from construction on the sale price at that time. We note that the home sold previously in November 2003; however, we could not prepare a Before and After analysis utilizing this prior transaction as the most recent sale was marketed as a passive solar home. For these reasons, Adjoining Property 38 was excluded from further analysis.

Adjoining Property 41, located at 10095 367th Street, is subject to an existing 30-year lease for the southern 6.24 acres of the parcel for solar panels in the North Star solar farm. The property most recently sold in April 2021 for \$339,186 and previously in June 2017 for \$336,900. The sale of this property in May 2016 was to the solar developer for an above appraised value of \$365,000, which was an atypically motivated transaction. Because the property is a participating parcel in the solar farm, and due to the additional rental income from the land, this property was excluded from both paired sale and the Before and After Analysis.

Adjoining Property 44, located at 37083 Keystone Avenue, sold for \$257,000, or \$157.86 per square foot of finished living area, in August 2017 and is a one-story rambler style home with an unfinished basement. Sale listing materials indicated significant deferred maintenance, which would need to be accurately assessed in order to quantify an appropriate adjustment. Most comparable sales in the area either have finished or walk-out basements and no items of significant deferred maintenance. Due to limited comparable sales for this property, and the required adjustment for deferred maintenance, Adjoining Property 44 was excluded from a paired sales analysis. The prior sale of this property was in October 2016, to the solar developer for assemblage, for \$302,500. Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

Adjoining Property 45, located at 37206 Keystone Avenue, sold in June 2017 for \$290,000, or \$149.48 per square foot of finished living area, from the solar farm developer. The property is a split-entry home on over 20 acres. The home features an attached 3-car garage, a detached two-car garage with a finished second story, and a fenced in-ground pool. The County Assessor classified this property as agricultural due to its large acreage. Because this home is atypical (large acreage and pool) there were no comparable sales in the area and Adjoining Property 45 was excluded from further analysis. This home was previously purchased by the solar farm developer in July 2016 for \$450,000, an above market price, for assemblage during solar farm construction. After construction was complete, the home was sold in 2017 at a market-oriented price, in an average number of days

listed on the Multiple Listing Service (MLS). Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

Adjoining Property 47, located at 10090 367th Street, most recently sold in March 2018 for \$302,500, or \$127.53 per square foot of finished living area, from the solar farm developer. This home was previously purchased by the solar farm developer in August 2016 for \$360,800, an above market price, for assemblage during solar farm construction. According to the broker, Cliff Sheppeck, the original owner leased the house back from the developer after the sale, never moved out, and was hired to do maintenance and upkeep on the other six houses the developer purchased in the area. When the developer no longer needed the property, he sold it back to the original owner in 2018 at a market-oriented price. Because of the relationship between the parties in 2018 and 2016, we have not included it in a Paired Sales Analysis nor a Before and After analysis.

Properties Included in Paired Sales Analysis

Adjoining Property 3, located at 10009 375th Street, sold most recently in July 2019 for \$260,000, or \$172.41 per square foot of finished living area. This property is improved with a one-story, modular/pre-fabricated home in the rambler style, with an English basement, on just over five acres of land. Although this home sold most recently in July 2019 for \$260,000, it had also sold in March 2016 for \$219,900, during construction of the solar farm. The home previously sold in March of 2005 for \$163,000. We have excluded the 2016 sale from paired sale analysis because we cannot separate any influence from construction on the sale price at that time. However, we can calculate the average monthly appreciation from 2005 to 2019 (+0.27 percent), which is higher than the average monthly home price appreciation in the same zip code of 55056 - according to the FHFA Housing Price Index (discussed in more detail later), local home appreciation was 0.0 percent per month over the same period. It is evident that the home value increased at a higher rate than homes in the local area over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm. The buyer's broker in the 2019 sale, Gail Reinhard, noted that the buyer had no concerns or issues with the home's proximity to the solar farm and the price paid was market oriented. This home qualified for a paired sales analysis and was studied in Group 4, as detailed on subsequent pages.

Adjoining Property 18, located at 37096 Little Oak Lane, sold in April 2017 for \$289,000, or \$119.82 per square foot of finished living area. The home is a rambler style, one-story, home with a finished walk-out basement on a 2.07-acre parcel. The improvements on this property are located approximately 225 feet from the nearest solar panel. The buyer's broker, Amy Lamb, noted that the home was in good shape and had been on the market for two years, because the seller would not lower the price to market levels during previous listings. In the summer, Lamb noted, the solar panels were barely visible from the back of the property, but in winter they were visible. Lamb asked the buyers if the solar panel view would be a problem and their opinion was that the neighboring solar panels meant no other development that created traffic or noise would be built to disturb them. This home qualified for a paired sales analysis and was studied in Group 2, as detailed on subsequent pages. We have also studied this property in a Before and After analysis later in this report as it also sold in 2006, prior to construction of the North Star solar farm. The average monthly change in value from 2006 to 2017 (-0.05 percent) is higher than the average monthly home price appreciation in the same zip code of 55056 according to the FHFA Housing Price Index, which was -0.10 percent per month over the same period. It is evident that the home's value reflects a better rate from the prior sale than homes in the local area over the same period.

Adjoining Property 19, located at 37056 Little Oak Lane, sold in August 2021 for \$435,000, or \$205.09 per square foot of finished living area. The property was listed for approximately 14 days on the market before going under contract. The home is a split-level style house on 2.37 acres. The improvements on this property are located approximately 280 feet from the nearest solar panel. This property also sold previously in June 2013 for \$208,000 before the solar farm was constructed. The average monthly appreciation from 2013 to 2021 (+0.76 percent) was higher than the average monthly home price appreciation in the same zip code, per the FHFA Housing Price Index, of 0.58 percent per month over the same period. The data indicates the home value increased at a higher rate than homes in the local area over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm. This home qualified for a paired sales analysis and was studied in Group 5, as detailed on subsequent pages.

Adjoining Property 22, located at 11210 367th Street, sold in April 2021 for \$430,000, or \$114.48 per square foot of finished living area. The property was listed on the market for 5 days before going under contract and sold \$5,000 above its asking price. It is a rambler built in 1974 with a full finished basement and has some ancillary farm buildings on a 5.2 acre site. This property also sold previously in March 2015 for \$280,000 during the construction of the solar farm and December 2003 for \$107,000 before the solar farm was constructed. We have excluded the 2015 sale from paired sale analysis, due to the influence from construction on the sale price at that time but have analyzed the 2021 sale in our analysis. This sale's average monthly appreciation from 2003 to 2021 (+0.67 percent), is higher than the average monthly home price appreciation in the same zip code, per the FHFA Housing Price Index of 0.12 percent per month over the same period. This demonstrates that the Target home value increased at a higher rate than homes in the local area over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm. Additionally, the most recent sale of the Adjoining Property 22 was studied in Group 6, as detailed on subsequent pages.

Adjoining Property 42, located at 10200 367th Street, sold in November 2017 for \$330,000, or \$151.93 per square foot of finished living area. The home is a split-level style house on 9.30 acres. The improvements on this property are approximately 393 feet from the nearest solar panel. This home qualified for a paired sales analysis and was studied in Group 1, as detailed on subsequent pages. This home was previously purchased by the solar farm developer in July 2016 for \$387,900, an above market price, for assemblage during solar farm construction. After construction was complete, the home was sold in 2017 at a market-oriented price, in an average number of days listed on the Multiple Listing Service (MLS). Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis. However, this property also sold previously in October 2004 for \$309,900 before the solar farm was constructed. The average monthly appreciation from 2004 to 2017 (+0.04 percent) is higher than the average monthly home price appreciation in the same zip code, per the FHFA Housing Price Index, of -0.02 percent per month over the same period. This home's value increased at a higher rate than homes in the local area over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm.

This property also resold for \$454,900 in January 2022. The previous 2017 transaction at \$330,000, represents an increase of \$124,900, or 37.85%. The monthly rate of appreciation is 0.64%, compared to the FHFA Housing Price Index for the same zip code, of 0.58% per month during the same time period. According to Mary Beck, the buyer's broker, the buyers did consider whether looking at the solar panels bothered them, but they considered that the solar farm would not be developed into housing in the future to be a good thing.

Adjoining Property 43, located at 10254 367th Street, sold for \$335,000 in July 2017, for \$156.84 per square foot of finished gross living area, and is a split-level home with an atypical floor design. Most of the homes in the area, while having similar gross living areas, are one-story, single-family homes with basements. We conducted a search in the area for comparable above-grade, split level homes. Mr. Sheppeck was the listing broker for this property and confirmed its atypical nature. He indicated that it sold at a price that was in-line with the market even though split-level, two story homes are considered to be rare in the area. However, we were able to find comparably designed sales in the area, and have included the sale within our analysis, studied in Group 7, as detailed on subsequent pages. The prior sale of this property was to the solar developer for assemblage during construction for \$535,000, an above market price, in July 2016. Because this home traded in an atypically motivated transaction in 2016, we have not included this transaction a Before and After analysis. However, this property also sold previously in November 2005 for \$373,000 before the solar farm was constructed. The average monthly change in value from 2005 to 2017 (-0.08 percent) was the same as the average monthly home price appreciation in the same zip code, according to the FHFA Housing Price Index over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm.

Adjoining Property 46, located at 10132 367th Street, sold most recently in December 2020 for \$415,000, or \$196.87 per square foot of finished living area. The home is a split-level style house on 9.31 acres. The home features an attached 3-car heated garage, an 816 square foot detached heated garage, and a 1,400 square foot outbuilding. The improvements on this property are approximately 330 feet from the nearest solar panel. This home also sold in October 2017 for \$333,000 from the solar developer who had purchased it in September 2016 for \$387,900, an above market price, for assemblage during solar farm construction. After construction was complete, the home was sold in 2017 at a market-oriented price, in an average number of days listed on the Multiple Listing Service (MLS). This home qualified for a paired sales analysis and was studied in Group 1 (2017 sale), and in Group 3 (2020 sale), as detailed on subsequent pages. Because this home traded in an atypically motivated transaction in 2016, we have not included the 2016 sale in a Before and After analysis. However, this property also sold previously in July 2001 for \$226,800 before the solar farm was constructed. The average monthly appreciation from 2001 to 2017 (+0.20 percent) is higher than the average monthly home price appreciation in the same zip code according to the FHFA Housing Price Index, which was +0.08 percent per month over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm.

Adjoining Property 54, located at 10505 367th Street, sold in August 2016 for \$260,500, or \$137.83 per square foot of finished living area. The home is a split-level style house on 5.0 acres. The improvements on this property are located approximately 352 feet from the nearest solar panel. The sale of the property was at the end of the construction period, which completed in October 2016, after majority of the project infrastructure was completed; thus, we have incorporated this sale in the analysis. This home qualified for a paired sales analysis and was studied in Group 1, as detailed on subsequent pages. We have also studied this property in a Before and After analysis later in this report as it also sold in 1999 for \$123,294, prior to construction of the North Star solar farm. The average monthly appreciation from 1999 to 2016 (+0.36 percent) is higher than the average monthly home price appreciation in the same zip code, according to the FHFA Housing Price Index, which was +0.15 percent per month over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm.

Adjoining Property 57, located at 10655 367th Street, sold in November 2018 for \$304,900, or \$101.63 per square foot of finished living area. The home is a split-level style house on 5.0 acres. The home has an opportunity for a purchaser to add two baths (roughed in at the time of sale), two bedrooms, a family room, and storage in the lower level. We spoke with Jenna Bruski, the listing agent, who indicated that the improvements are unique, and could be divided into two separate dwelling units. According to the agent, the price paid reflected a slight discount because it required a specific buyer to undertake the build-out project on the lower level. It was on the market for a few months, but it was not unreasonable for the asset given its characteristics. Additionally, the agent indicated that potential purchasers did not mention the adjacency to the solar panels; there was no impact on the sale price because of adjacency to the panels. The improvements on this property are located approximately 285 feet from the nearest solar panel. This home qualified for a paired sales analysis and was studied in Group 9, as detailed on subsequent pages.

Adjoining Property 64, located at 36640 Kost Trail, sold in December 2019 for \$310,000, or \$139.70 per square foot of finished living area. The property is an above-grade, two-story home and has a partially finished basement, on 9.29 acres of land. The property also includes a detached 2-car garage and a pole barn. Jeff Turbeville, broker at Edina Realty Inc., explained this two-story home style is atypical in the area. However, we have identified comparable Control Area Sales and Adjoining Property 64 was studied in Group 8, as detailed on subsequent pages.

Paired Sales Analysis

Group 1

We analyzed three split-level homes that sold between 2016 and 2017 that were located adjacent to the North Star solar farm.

North Star Solar Test Area Sales - Group 1									
Adj. Property #	Address	Sale Price	Site Size (AC)	Beds	Baths	Year Built	GLA (SF)	Sale Date	Price PSF
54	10505 367th St	\$260,500	5.00	3	2	1999	1,890	Aug-16	\$137.83
42	10200 367th St	\$330,000	9.30	4	3	2003	2,172	Nov-17	\$151.93
46	10132 367th St	\$333,000	9.31	4	3	2001	2,108	Oct-17	\$157.97
Median		\$330,000	9.30	4	3	2001	2,108	Oct-17	\$151.93

Throughout our analysis we have relied on square footage data from the Chisago County Assessor's office for home sizes. We have included above-grade and finished below-grade square footage in our calculations as the market in this area considers finished square feet on every level to be livable. Split-level homes and those with basements or walkout basements are prevalent in this area. We note that the square footage for Adjoining Property 42 is shown on the MLS real estate listing from 2017 as being 2,350, we have utilized the Assessor's livable square footage of 2,172 in our analysis.

We analyzed 11 Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sales, that were not located in close proximity to the solar farm.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The Control Area Sales for Group 1 are split-level homes with either 3 or 4 bedrooms and 1.5 to 4 bathrooms. We excluded sales that were bank-owned, those between related parties, or others under duress as non-arm's length transactions.

When adjusting sale prices for market conditions (time between date of Test Area Sale and Control Area Sale date) throughout this analysis we have used regression analysis to identify the appropriate monthly market conditions adjustment. We utilized the Federal Housing Finance Agency House Price Index (FHFA HPI) for the zip code 55056, the zip code of all Test Area and Control Area Sales, for the compounded monthly rate of appreciation. The FHFA HPI is a broad measure of the movement of single-family house prices. The FHFA HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or refinancings on the same properties. The FHFA HPI serves as a timely, accurate indicator of house price trends at various geographic levels.²⁰ We adjusted Group 1 Control Area Sales using the FHFA HPI for the period from 2016 through 2017.

The results of our analysis for Group 1 are presented following.

CohnReznick Paired Sale Analysis North Star Solar Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (3)	Adjoining solar farm	\$151.93
Control Area Sales (11)	No: Not adjoining solar farm	\$139.50
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		8.91%

We note a somewhat large positive difference in adjusted median price per square foot between the median of the Test Area Sales and the Control Area Sales. The price differential is likely attributable to the larger parcel sizes of the Test Area Sales, which range from 5.00 acres to 9.31 acres. The Control Area Sales home sites range from 2.29 to 7.10 acres, with a median of 5.0 acres. Control Area Sales with lot sizes that bracketed the Test Area Sales on the high side did not transact during the period studied but the properties are considered comparable. **The sale prices of Adjoining Properties in Group 1 were not negatively impacted by the homes' proximity to the North Star solar farm.**

We note that the median unit sale price of the most recent sales of each of the excluded adjoining properties identified previously is \$141.44 per square foot. As indicated above, the included Test Area Sales have a median

²⁰ <https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index.aspx>

unit price of \$151.93 per square foot. Inclusion of the excluded adjoining property sales would not have made a conclusive impact on the conclusions of the paired sale analysis.

Group 2

We analyzed Adjoining Property 18, a single-story, rambler style home that sold in 2017.

North Star Solar Test Area Sale - Group 2									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median GLA (SF)	Median Sale Date	Median Price PSF
18	37096 Little Oak Ln	\$289,000	2.07	4	3.0	2001	2,412	Apr-17	\$119.82

We analyzed 10 Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

Adjoining Property 18 sits on a somewhat small lot for the home size in this area. So as to capture homes that bracket the Test Area Sale home size, those ranging from 1,700 square feet to 3,400 square feet of finished gross living area were included. The parameters of our search for Control Area Sales were widened to include lot sizes between 1 and 10 acres.

The Control Area Sales for Group 2 are rambler style homes with 4 bedrooms and 2 to 4 bathrooms on less than 10-acre parcels. We excluded sales that were bank-owned, those between related parties, or others under duress as non-arm's length transactions. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index for the zip code, for the period from 2016 through 2018.

CohnReznick Paired Sale Analysis North Star Solar Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (1)	Adjoining solar farm	\$119.82
Control Area Sales (10)	No: Not adjoining solar farm	\$116.33
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		3.00%

Noting no substantial price differential. it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 2.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Group 3

Adjoining Property 46 was analyzed as a 2017 sale in Group 1 and sold again most recently in December 2020.



Photo of 10132 367th Street (Adjoining Property 46) with view of solar arrays from 2020 MLS listing

North Star Solar Test Area Sale - Group 3									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median GLA (SF)	Median Sale Date	Median Price PSF
46	10132 367th St	\$415,000	9.31	4	3.0	2001	2,108	Dec-20	\$196.87

We analyzed ten Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

The Control Area Sales for Group 3 are split-level style homes and similar with 4 bedrooms and 2 or 3 bathrooms on one to ten acre parcels. We excluded sales that were bank-owned, those between related parties, or others under duress as non-arm's length transactions. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2018 through mid-year 2021 (the most recent data available). The results of our analysis are presented next.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis North Star Solar Group 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$196.87
Control Area Sales (10)	No: Not adjoining solar farm	\$151.73
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		29.75%

We note that the sale price of the 2020 sale of Adjoining Property 46 is one of the highest for this home type (split-level) in all the County Assessor data from 2016 to year to date 2021 for North Branch and Sunrise Townships. However, the selling broker, Candace Rindahl, remarked that the price was market for the area at the time of sale. We see this in a study of the rate of appreciation over the course of three years between the prior sale and most recent sale. Adjoining Property 46 appreciated at a higher rate than the local area, as seen in the following table.

Test Area Sale										55056 Zip Code FHFA Housing Price Index Change	
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Monthly Appreciation Rate	Total Appreciation	Monthly Appreciation Rate
AP 46	10132 367th St	9.31	2,108	12/20/20	\$415,000	10/20/17	\$333,000	24.62%	0.58%	17.43%	0.42%

We note a somewhat large positive difference in adjusted median price per square foot between the Test Area Sale and the Control Area Sales. The most comparable Control Area Sale, 6836 410th Street, sold for an adjusted sale price per square foot of \$193.35, reflecting a difference of 1.8 percent to the unit sale price of the Test Area Sale. We find that on a macro and micro level of analysis, **the sale price of Adjoining Property 46 (Group 3) was not negatively impacted by its proximity to the North Star solar farm.**

The differential between the Test Area Sale and the Control Area Sales is much higher than any of our other studies; we have considered this to be an outlier. While the indication shows that the adjacent solar farm has not negatively impacted the property value for this home, we have considered that this house has “set the market” for this kind of property type (home style, age and acreage) – we believe that this differential will likely stabilize in the near future as other homes catch up to the appreciation shown by Adjoining Property 46. Thus, we have not included this Group in the collection of impact studies in our conclusion.

Group 4

We analyzed Adjoining Property 3, a single-story, rambler style home that sold in 2019.

North Star Solar Test Area Sale - Group 4									
Adj. Property #	Address	Sale Price	Site Size (AC)	Bedrooms	Bathrooms	Year Built/ Renovated	GLA (SF)	Sale Date	Price PSF
3	10009 375TH ST	\$260,000	5.05	3	2.5	1980 / 2005	1,508	Jul-19	\$172.41

We analyzed seven Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

Adjoining Property 3 sits on a somewhat large lot for the home size in this area. So as to capture homes that bracket the Test Area Sale home size, those ranging from 1,200 to 2,000 square feet of finished gross living area were included. The parameters of our search for Control Area Sales were widened to include lot sizes between 2 and 7 acres.

The Control Area Sales for Group 4 are rambler style homes with 2 to 4 bedrooms and 2 to 3 bathrooms on less than 7-acre parcels but greater than 2 acre parcels. We excluded sales that were bank-owned, those between related parties, or others under duress as non-arm's length transactions. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2018 through 2020.

CohnReznick Paired Sale Analysis North Star Solar Group 4		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$172.41
Control Area Sales (7)	No: Not adjoining solar farm	\$170.86
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		0.91%

Noting no substantial price differential, it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 4.

Group 5

We analyzed Adjoining Property 19, a split level-style home that sold in 2021. While this sale is not yet published in the Chisago County Assessor's data, the sale has been recorded in the public record and the MLS.

North Star Solar Test Area Sale - Group 5									
Adj. Property #	Address	Sale Price	Site Size (AC)	Bedrooms	Bathrooms	Year Built/ Renovated	GLA (SF)	Sale Date	Price PSF
19	37056 LITTLE OAK LN	\$435,000	2.37	4	3.0	2001	2,121	Aug-21	\$205.09

We analyzed eight Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

So as to capture homes that bracket the Test Area Sale home size, those ranging from 1,500 to 2,500 square feet of finished gross living area were included. The parameters of our search for Control Area Sales were widened to include lot sizes between 2 and 6 acres.

The Control Area Sales for Group 5 are split level homes with 3 to 5 bedrooms and 2 to 3 bathrooms on less than 6-acre parcels but greater than 2 acre parcels. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2019 through mid-year 2021 (the most recent data available).

CohnReznick Paired Sale Analysis North Star Solar Group 5		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$205.09
Control Area Sales (8)	No: Not adjoining solar farm	\$170.88
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		20.02%

Noting no substantial negative price differential, it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 5. We note that the sale price of the 2021 sale of Adjoining Property 19 is one of the highest for this home type (split-level) in all the County Assessor data from 2016 to year to date 2021 for North Branch and Sunrise Townships. We see this in a study of the rate of appreciation between the prior sale and most recent sale. Adjoining Property 19 appreciated at a higher rate than the local area, as seen in the following table.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Test Area Sale										55056 Zip Code FHFA Housing Price Index Change	
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Monthly Appreciation Rate	Total Appreciation*	Monthly Appreciation Rate
AP 19	37056 Little Oak Lane	2.37	2,121	8/20/21	\$435,000	6/21/13	\$208,000	109.13%	0.76%	75.96%	0.58%

*The 2021 HPI for the zip code is not available as of the report date. The estimate presented relies on the index for 2020, grown by the 2021 trend for the census region on a monthly basis through August 2021.

Group 6

We analyzed Adjoining Property 22, a rambler style home that sold in 2019. We note this site has a large lower-level with a second full kitchen, which is much larger than surrounding homes in the same marketplace.

North Star Solar Test Area Sale - Group 6									
Adj. Property #	Address	Sale Price	Site Size (AC)	Bedrooms	Bathrooms	Year Built/ Renovated	Finished GLA (SF)	Sale Date	Price PSF
22	11210 367TH ST	\$430,000	5.34	4	2.5	1975	3,756	Apr-21	\$114.48

We analyzed four Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

Adjoining Property 22 sits on a large lot for the home size in this area. So as to capture homes that bracket the Test Area Sale home size, those ranging from 3,200 to 5,000 square feet of finished gross living area were included. The parameters of our search for Control Area Sales include lot sizes between 1 and 10 acres.

Comparable sales of large rambler-style homes on larger lots with finished basements were less prevalent in Sunrise and North Branch Townships. The Control Area Sales for Group 6 are rambler style homes with 4 to 6 bedrooms on less than 10-acre parcels but greater than 1 acre parcels. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2020 through mid-year 2021 (the most recent data available).

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

CohnReznick Paired Sale Analysis North Star Solar Group 6		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$114.48
Control Area Sales (4)	No: Not adjoining solar farm	\$120.49
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		-4.99%

One of the Control Area Sales located at 44869 John Avenue reflects an adjusted unit value of \$114.96 per square feet of finished gross living area, or a differential of -0.42 percent, which is considered nominal. While the unique characteristics of the Test Area Sale (Adjoining Property 22) result in what we consider to be an outlier in the marketplace, it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 6.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Group 7

We analyzed Adjoining Property 43, which is a split-level style home that sold in 2017.

North Star Solar Test Area Sale - Group 7									
Adj. Property #	Address	Sale Price	Site Size (AC)	Bedrooms	Bathrooms	Year Built/ Renovated	GLA (SF)	Sale Date	Price PSF
43	10254 367TH ST	\$335,000	9.29	3	2.5	2005/2009	2,136	Oct-17	\$156.84
Median		\$335,000	9.29	3	2.5	2005/2009	2,136	Oct-17	\$156.84

We analyzed 11 Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

Adjoining Property 43 sits on a large lot for the home size in this area. So as to capture homes that bracket the Test Area Sale home size, those ranging from 1,500 square feet to 2,500 square feet of finished gross living area were included. The parameters of our search for Control Area Sales were widened to include lot sizes between 2 and 10 acres.

The Control Area Sales for Group 7 are generally split-level homes with 3 to 4 bedrooms and 2 to 3 bathrooms on less than 10-acre parcels, but greater than 2 acre parcels. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2016 through 2019.

CohnReznick Paired Sale Analysis North Star Solar Group 7		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$156.84
Control Area Sales (11)	No: Not adjoining solar farm	\$135.63
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		15.64%

Noting no substantial negative price differential, it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 6. Homes in this area are typically on 2 to 5 acre lot sizes. One home sale at 40723 Lowden Ave, an 1,896 square foot split level home built in 1999 on 10.1 acres, sold for a unit price of \$152.43 per square foot, unadjusted, in June 2018, or \$146.92 per square foot after adjustments for market conditions. This reflects a variance of 6.8 percent, which does not indicate a diminution in price.

Group 8

We analyzed Adjoining Property 64, a two-story home that sold in 2019.

North Star Solar Test Area Sale - Group 8									
Adj. Property #	Address	Sale Price	Site Size (AC)	Bedrooms	Bathrooms	Year Built/ Renovated	GLA (SF)	Sale Date	Price PSF
64	36640 KOST TRL	\$310,000	8.13	4	3.0	1987 / 2003	2,219	Dec-19	\$139.70

We analyzed five Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

Adjoining Property 64 sits on a somewhat large lot for the home size in this area. So as to capture homes that bracket the Test Area Sale home size, those ranging from 1,500 square feet to 2,500 square feet of finished gross living area, the parameters of our search for Control Area Sales were widened to include lot sizes between 2 and 10 acres.

The Control Area Sales for Group 8 are two story homes with 3 to 4 bedrooms and 1.5 to 3 bathrooms on less than 10-acre parcels but greater than 2 acre parcels. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2018 through 2020.

CohnReznick Paired Sale Analysis North Star Solar Group 8		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$139.70
Control Area Sales (5)	No: Not adjoining solar farm	\$132.68
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		5.29%

Noting no substantial price differential. it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 8.

Group 9

We analyzed Adjoining Property 57, a split-level home with a partially finished lower level that sold in 2018. The home has an opportunity for a purchaser to add two baths (roughed in at the time of sale), two bedrooms, a family room, and storage in the lower level. While the lower level is not fully finished, a purchaser would likely evaluate the sale price against comparables based on the potential gross living area, inclusive of the cost to complete the build-out. We have relied on this unit of comparison in our analysis.

North Star Solar Test Area Sale - Group 9									
Adj. Property #	Address	Sale Price	Site Size (AC)	Bedrooms	Bathrooms	Year Built/Renovated	GLA (SF)	Sale Date	Price PSF
57	10655 367TH ST	\$304,900	5.00	3	4.0	1998	3,000	Nov-18	\$101.63

We analyzed eight Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

Adjoining Property 57 sits on a somewhat large lot for the home size in this area. So as to capture homes that bracket the Test Area Sale home size, those ranging from 2,648 square feet to 4,324 square feet of finished gross living area were included. The parameters of our search for Control Area Sales were widened to include lot sizes between approximately 1 and 7 acres.

The Control Area Sales for Group 9 are split level and rambler homes with lower levels, with 3 to 5 bedrooms and 2 to 4 bathrooms on less than 7-acre parcels but greater than approximately 1 acre parcels. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2017 through 2019.

CohnReznick Paired Sale Analysis North Star Solar Group 9		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$101.63
Control Area Sales (8)	No: Not adjoining solar farm	\$103.95
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		-2.22%

Noting no substantial price differential. it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 9.

Repeat Sales Analysis (Before and After Construction of the Solar Farm)

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

In a 2017 study conducted by Chisago County Assessor John Keefe, Keefe analyzed the sales of 15 homes alongside or near the North Star Solar Farm that sold between January 2016 and October 2017. Based on trends exhibited by 750+ sales throughout the county, Keefe concluded that the homes, located on 375th, 367th, Keystone, Little Oak, Lincoln Trail, and Kost Trail were all “in excess of assessed” and reported that “valuation hasn’t suffered.”²¹

Considering Keefe’s 2017 study, we conducted a supplemental analysis in which we compared the sale prices of homes that are in our Test Area Groups that are adjacent to the North Star Solar Farm to the previous sale price of the home, commonly known as a “Repeat Sales Analysis” utilizing a sale and resale of the same property. These sales reflect the average site size, home type, and home size of properties in the surrounding area. In our comparison for each property analyzed, we calculated the total appreciation between each sale, the number of months that elapsed between each sale, and determined the monthly appreciation rate for the property. We then compared the extracted monthly appreciation rates to the change in the Federal Housing Finance Agency (FHFA) Home Price Index in Minnesota’s 55056 zip code (where the studied homes are located) over the same period. The index for zip codes is measured on a yearly basis and is presented to the right. We note, there were two Test Area Sales which transacted in April and August 2021. The FHFA Home Price Index (HPI) by zip code does not have 2021 data available as of the report date since the calendar year has not completed. We have analyzed the FHFA Home Price Index, not seasonally adjusted, for the West North Central region of the USA, which includes Minnesota, and have estimated the percentage increase from December 2020 to each April and August 2021 by the corresponding monthly change for the West North Central census division.

We conducted the same analysis for 38 single-family Control Group properties that had repeat sales that are not within proximity to the North Star Solar Farm. The tables on the following page present this study. The applied same estimation for the HPI for the Control Area Sales that sold in 2021.

Some homes experienced depreciation between sale dates. During the calendar years of 2005, 2006 and 2007, housing prices in the United States were reaching their peak. In 2006 the HPI for the zip code reached 251.83, a record at that time. Post-recession homes prices, after 2008 continued to fall until 2012, the effective bottom at 155.38, a drop of more than 38% in market value over 6 years from the peak. The market did not recover to the same or higher levels until 2019 and 2020. When the homes sold in

55056 Zip Code - Housing Price Index Change (Year Over Year) Not Seasonally Adjusted			
Year	Annual Index	Annual Change (%)	Compounded Monthly Change (%)
1991	100.00		
1992	101.15	1.15%	0.10%
1993	105.00	3.81%	0.31%
1994	110.54	5.28%	0.43%
1995	121.51	9.92%	0.79%
1996	127.27	4.74%	0.39%
1997	134.29	5.52%	0.45%
1998	141.08	5.06%	0.41%
1999	149.86	6.22%	0.50%
2000	169.13	12.86%	1.01%
2001	187.18	10.67%	0.85%
2002	200.83	7.29%	0.59%
2003	212.82	5.97%	0.48%
2004	226.83	6.58%	0.53%
2005	246.73	8.77%	0.70%
2006	251.83	2.07%	0.17%
2007	243.35	-3.37%	-0.29%
2008	223.07	-8.33%	-0.72%
2009	196.72	-11.81%	-1.04%
2010	179.99	-8.50%	-0.74%
2011	163.09	-9.39%	-0.82%
2012	155.38	-4.73%	-0.40%
2013	165.02	6.20%	0.50%
2014	175.59	6.41%	0.52%
2015	187.02	6.51%	0.53%
2016	203.03	8.56%	0.69%
2017	220.28	8.50%	0.68%
2018	235.98	7.13%	0.58%
2019	248.44	5.28%	0.43%
2020	258.67	4.12%	0.34%

²¹ <https://www.cleanenergyresourceteams.org/chisago-county-boards-real-estate-update-shows-solar-has-no-impact-property-values>

2017 and 2016, respectively, the housing market had not fully recovered in the area and the negative appreciation tracks with the overall market conditions.

Test Area Sales Group											55056 Zip Code - FHFA Housing Price Index Change			
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Year of Most Recent Sale	Prior Sale Year Index Level	Total Appreciation	Monthly Appreciation Rate
AP 3	10009 375th Street	5.10	1,508	Jul-19	\$260,000	Mar-05	\$163,000	59.51%	172	0.27%	248.44	246.73	0.69%	0.00%
AP 18	37096 Little Oak Lane	2.10	2,412	Apr-17	\$289,000	Jan-06	\$308,000	-6.17%	134	-0.05%	220.28	251.83	-12.53%	-0.10%
AP 19	37056 Little Oak Lane	2.37	2,121	Aug-21	\$435,000	Jun-13	\$208,000	109.13%	98	0.76%	290.37	165.02	75.96%	0.58%
AP 22	11210 367th Street	5.20	3,756	Apr-21	\$430,000	Dec-03	\$107,000	301.87%	208	0.67%	274.78	212.82	29.11%	0.12%
AP 42	10200 367th Street	9.30	2,172	Jan-22	\$454,900	Nov-17	\$330,000	37.85%	50	0.64%	294.76	220.28	33.81%	0.58%
AP 43	10254 367th Street	9.30	2,136	Oct-17	\$335,000	Nov-05	\$373,000	-10.19%	143	-0.08%	220.28	246.73	-10.72%	-0.08%
AP 46	10132 367th Street	9.31	2,108	Oct-17	\$333,000	Jul-01	\$226,800	46.83%	196	0.20%	220.28	187.18	17.68%	0.08%
AP 54	10505 367th Avenue	5.00	1,890	Aug-16	\$260,500	Apr-99	\$123,294	111.28%	208	0.36%	203.03	149.86	35.48%	0.15%
Median - Test Area Sales		5.15	2,129							0.32%				0.10%

Control Area Sales Group											55056 Zip Code - FHFA Housing Price Index Change			
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Year of Most Recent Sale	Prior Sale Year Index Level	Total Appreciation	Monthly Appreciation Rate
G1-1	10589 Wilcox Road	5.00	1,900	Jul-16	\$262,500	Sep-07	\$223,700	17.34%	105	0.15%	203.03	243.35	-16.57%	-0.17%
G1-2	5183 366th Street	2.29	1,530	Jul-16	\$227,708	Apr-07	\$207,000	10.00%	112	0.09%	203.03	243.35	-16.57%	-0.16%
G1-3	4359 Elk Court	2.50	1,970	Jan-17	\$263,000	Nov-98	\$175,365	49.97%	218	0.19%	220.28	141.08	56.14%	0.20%
G1-4	39088 More Ferry Road	5.00	1,838	Jan-17	\$229,000	Sep-05	\$185,000	23.78%	136	0.16%	220.28	246.73	-10.72%	-0.08%
G1-7/G5-4	4737 377th Street	2.50	2,002	Nov-20	\$298,000	May-99	\$138,400	115.32%	257	0.30%	258.67	149.86	72.61%	0.21%
G1-8	8628 380th Street	5.00	1,842	Jul-17	\$275,000	Apr-10	\$203,000	35.47%	86	0.35%	220.28	179.99	22.38%	0.23%
G1-9	6417 360th Street	5.00	2,346	Jul-17	\$325,009	May-08	\$270,000	20.37%	110	0.17%	220.28	223.07	-1.25%	-0.01%
G2-1	36338 Lincoln Trail	10.00	2,641	Jun-16	\$304,000	Feb-06	\$361,036	-15.80%	124	-0.14%	203.03	251.83	-19.38%	-0.17%
G2-10	4779 374th Street	1.25	2,252	Aug-18	\$255,000	Sep-00	\$155,860	63.61%	215	0.23%	235.98	169.13	39.53%	0.15%
G2-2	40956 Greystone Ave	2.03	2,571	Aug-16	\$267,776	Aug-05	\$285,900	-6.34%	132	-0.05%	203.03	246.73	-17.71%	-0.15%
G2-3	6551 372nd Street	4.98	2,552	Jun-17	\$290,000	Oct-04	\$319,990	-9.37%	152	-0.06%	220.28	226.83	-2.89%	-0.02%
G2-6	37420 Falcon Ave	9.93	1,792	May-18	\$285,900	Mar-04	\$225,000	27.07%	170	0.14%	235.98	226.83	4.03%	0.02%
G2-9/G9-8	38586 July Ave	6.02	3,082	Jun-18	\$308,000	Sep-05	\$275,000	12.00%	153	0.07%	235.98	246.73	-4.36%	-0.03%
G3-10/G4-5	4360 Elk Court	2.52	1,773	Apr-20	\$299,900	Jul-99	\$163,500	83.43%	248	0.24%	258.67	149.86	72.61%	0.22%
G3-5	9389 430th Street	9.95	2,235	Jan-21	\$340,000	Feb-95	\$110,200	208.53%	311	0.36%	260.02	121.51	113.99%	0.24%
G3-6	40625 Finley Road	1.09	1,840	Dec-19	\$241,000	May-09	\$174,500	38.11%	126	0.26%	248.44	196.72	26.29%	0.18%
G3-8	42155 Joywood Ave	5.00	2,180	Apr-20	\$308,300	Jun-00	\$195,000	58.10%	238	0.19%	258.67	169.13	52.94%	0.18%
G3-9/G7-1	6836 410th Street	9.79	1,817	Oct-19	\$322,000	Sep-99	\$110,000	192.73%	242	0.45%	248.44	149.86	65.78%	0.21%
G4-1	5584 411th Street	2.03	1,912	Feb-18	\$286,000	Jan-03	\$230,000	24.35%	181	0.12%	235.98	212.82	10.88%	0.06%
G4-2	9672 420th Street	5.04	1,466	Nov-18	\$245,000	Apr-94	\$114,580	113.82%	296	0.26%	235.98	110.54	113.48%	0.26%
G4-3	4403 366th Court	2.39	1,714	Nov-18	\$287,000	Jun-06	\$263,500	8.92%	149	0.06%	235.98	251.83	-6.29%	-0.04%
G4-4	42205 Joywood Ave	5.04	1,262	Jun-19	\$234,000	Mar-99	\$133,680	75.04%	244	0.23%	248.44	149.86	65.78%	0.21%
G5-1/G7-9	9726 420th Street	5.00	1,720	Dec-19	\$253,000	Mar-95	\$95,500	164.92%	296	0.33%	248.44	121.51	104.46%	0.24%
G5-3	4885 366th Street	2.00	1,617	Jul-20	\$292,000	Feb-99	\$80,200	264.09%	257	0.50%	258.67	149.86	72.61%	0.21%
G5-5	7630 393rd Court	3.09	2,325	Dec-20	\$360,000	Sep-04	\$247,000	45.75%	195	0.19%	258.67	226.83	14.04%	0.07%
G5-6	37867 Eagewood Ave	2.50	1,856	Dec-20	\$308,000	Nov-11	\$164,000	87.80%	109	0.58%	258.67	163.09	58.61%	0.42%
G5-7	40620 Finley Road	2.34	1,604	May-21	\$302,000	Jul-98	\$116,982	158.16%	274	0.35%	283.31	141.08	100.81%	0.26%
G5-8	40830 Fenian Way	2.59	2,310	Jun-21	\$356,000	Oct-96	\$127,305	179.64%	296	0.35%	287.37	127.27	125.80%	0.28%
G6-2	44869 John Ave	9.70	3,292	Mar-20	\$340,000	Nov-05	\$340,000	0.00%	172	0.00%	258.67	246.73	4.84%	0.03%
G6-3	7259 407th Street	1.02	3,258	Jun-21	\$430,000	Mar-98	\$199,900	115.11%	279	0.28%	287.37	141.08	103.70%	0.26%
G7-1	7630 393rd Ct	3.09	2,325	Nov-18	\$319,900	Sep-04	\$247,000	29.51%	170	0.15%	235.98	226.83	4.03%	0.02%
G7-10	5460 367th Ct	7.10	1,612	Feb-17	\$201,000	May-07	\$226,000	-11.06%	117	-0.10%	220.28	243.35	-9.48%	-0.08%
G7-11	5183 366th St	2.28	1,579	Jul-16	\$201,000	Apr-07	\$207,000	-2.90%	112	-0.03%	203.03	243.35	-16.57%	-0.16%
G7-3	8628 380th St	5.00	1,978	Jul-17	\$275,000	Nov-99	\$140,000	96.43%	211	0.32%	220.28	149.86	46.99%	0.18%
G7-4	5967 Birch St	2.65	1,963	Oct-18	\$272,000	Jan-96	\$102,000	166.67%	273	0.36%	235.98	127.27	85.42%	0.23%
G7-5	39088 More Ferry Rd	5.00	1,906	Mar-19	\$266,000	Sep-05	\$185,000	43.78%	162	0.22%	248.44	246.73	0.69%	0.00%
G7-9	39779 Elk Ave	3.36	1,620	Jun-17	\$255,000	Feb-13	\$216,000	18.06%	52	0.32%	220.28	165.02	33.49%	0.56%
G8-2	4406 366th Street	2.50	2,464	Oct-18	\$270,000	Jun-05	\$260,000	3.85%	160	0.02%	235.98	246.73	-4.36%	-0.03%
G8-4	6670 372nd Street	4.00	2,111	Aug-19	\$255,550	Feb-07	\$238,000	7.37%	150	0.05%	248.44	243.35	2.09%	0.01%
G9-1	6021 371st Street	5.09	3,754	Jun-19	\$385,000	Aug-98	\$109,900	250.32%	250	0.50%	248.44	141.08	76.10%	0.23%
G9-5	39221 Edgewater Lane	0.92	2,648	Jan-18	\$275,000	Nov-10	\$185,000	48.65%	87	0.46%	235.98	179.99	31.11%	0.31%
G9-6	40655 Harvester Cir	1.75	2,936	May-19	\$325,000	Aug-01	\$204,950	58.58%	213	0.22%	248.44	187.18	32.73%	0.13%
G9-8	7579 397th Street	2.04	2,712	May-18	\$281,000	Jan-96	\$127,000	121.26%	269	0.30%	235.98	127.27	85.42%	0.23%
Median - Control Area Sales		3.09	1,970							0.22%				0.18%

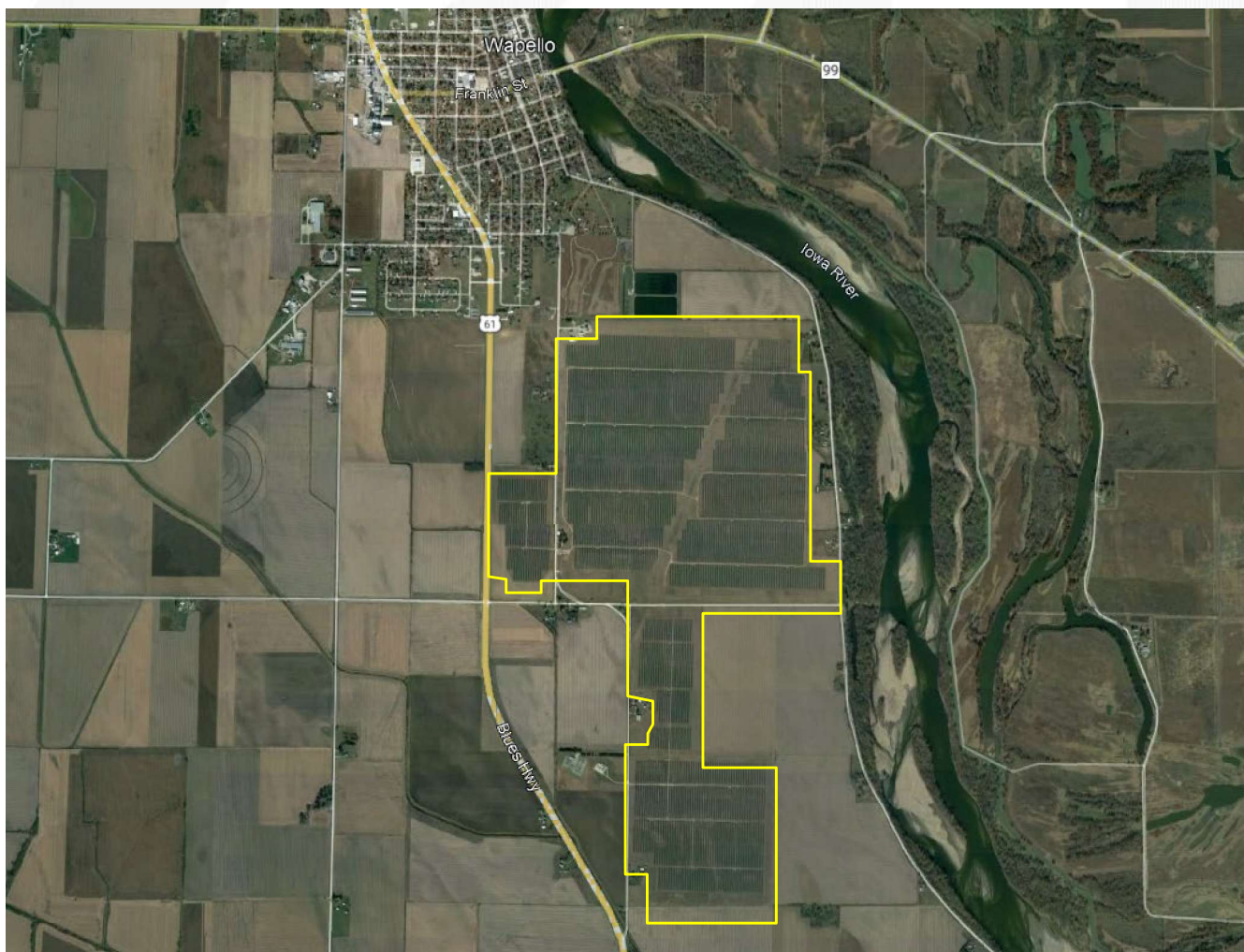
Most home sites outside of a subdivision in this area are within the 2.00- to 5.00-acre range, as shown in the Control Area Sales table above. The median gross living area for each group differs by approximately 160 square feet of living area; however, the analysis described in this section, does not require adjustments to the sales as we are evaluating the difference in appreciation rates between a sale and resale of the same property.

Conclusion

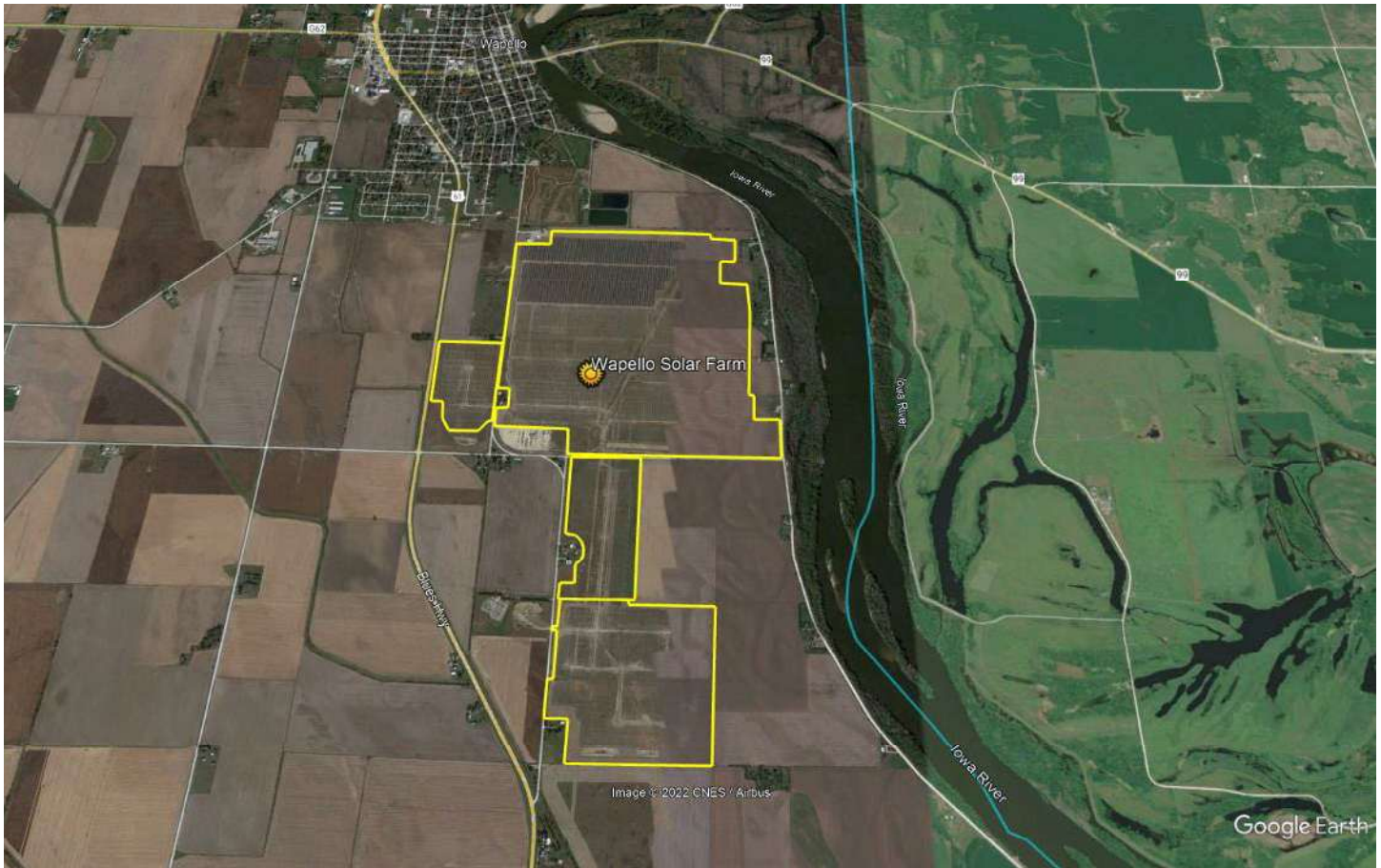
In our analysis of 102 resales of homes adjacent to the North Star Solar facility and in the surrounding area, when compared to the FHFA home price index for the local zip code, the median monthly appreciation rate of

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

the Test Area Sales group and the Control Area Sales group both outperformed the average for the zip code, as depicted in the far-right column in the tables on the prior page. Additionally, there is no discernable difference between the median rates of appreciation for the Test Area Sales compared to the Control Area Sales. As such, we concur with Assessor Keefe's conclusion that there does not appear to be a consistent detrimental impact on properties adjacent to the North Star Solar Farm.

SOLAR FARM 7: WAPELLO SOLAR FARM, LOUISA COUNTY, IA**Coordinates:** Latitude 41.153697, Longitude -91.177100**PINs:** Multiple**Total Land Size:** Approximately 800 acres**Population Density (2023):** 25 people per square mile (Louisa County)**Date Project Announced:** March 2019**Date Project Completed:** March 2021**Output:** 100 MW AC**Date Study Completed:** December 2022 **Date Study Updated:** September 2025

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Approximate Wapello Solar boundaries outlined in yellow, aerial imagery provided by Google Earth dated October 2020

The Wapello Solar use is located in Wapello, Iowa and is adjacent to J Avenue and bisected by 65th Street, in between US Highway 61 to the west and 123rd Avenue to the east. The current owner of the solar farm is Clenera while Renewable Energy Systems (RES) developed the solar facility. Central Iowa Power Cooperative has entered a 25-year power purchase agreement to purchase the solar farm's energy. The solar farm went into operation in March 2021 and can generate power for approximately 21,000 homes. Nearly 318,000 panels comprise the farm.

The Surrounding Area: The Wapello Solar installation is located in Wapello, adjacent to the Iowa River to the east and approximately 5 miles west of the Mississippi River, in the south eastern portion of Louisa County, Iowa. Louisa County is located on the western side of the Mississippi River, along the Iowa-Illinois border. The solar site is approximately 38 miles southeast of Iowa City and 40 miles southwest of the City of Davenport.

As of July 2025, per the U.S. Energy Information Agency, the Wapello Solar project is one of the twenty-eight solar farms in Iowa and the sole solar farm located within Louisa County, Iowa. The Wapello Solar project is the third largest solar farm in Iowa behind the 150 MW Duane Arnold Solar Project located in Linn County and the 150 MW Wever Solar Project in Lee County.

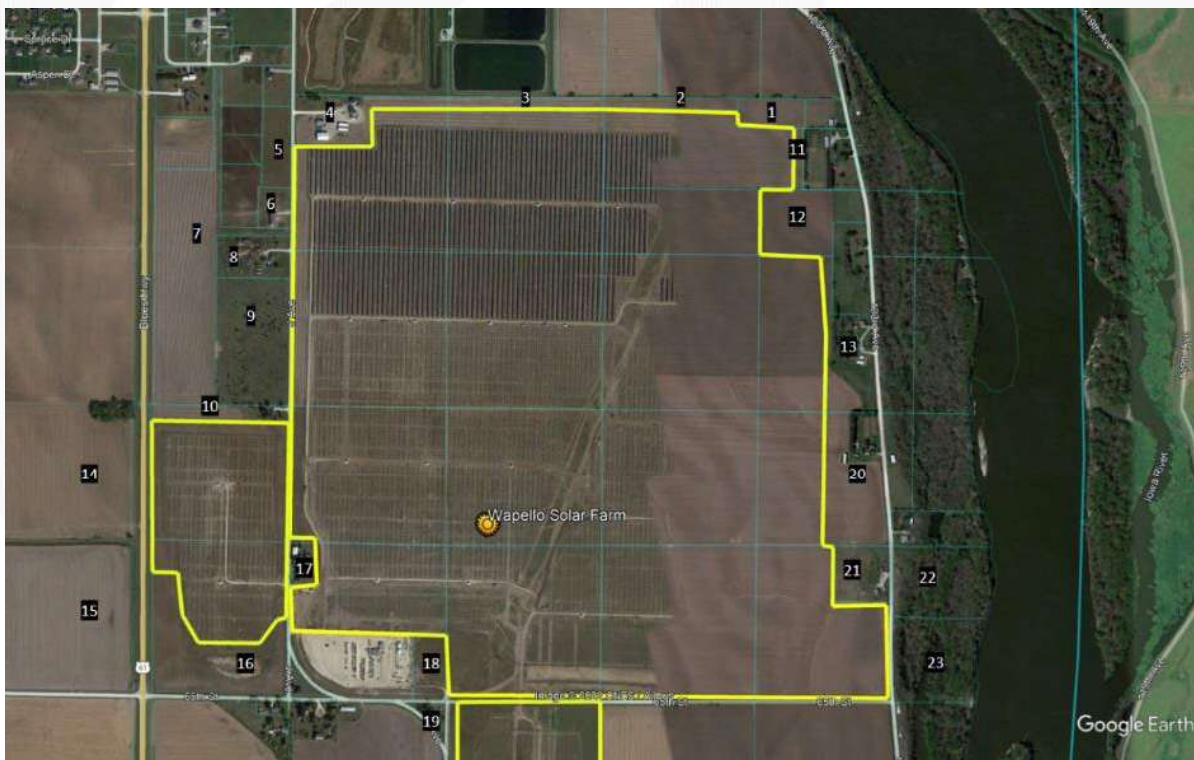
Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The Immediate Area: The solar farm is located along J Avenue, just east of U.S. Highway 61 and west of 123rd Avenue. The solar farm is immediately surrounded by primarily agricultural land with residential homestead properties interspersed to the east and west. To the northwest lies more densely concentrated residential and commercial properties in the City of Wapello.

Real Estate Tax Info: The Wapello Solar project has yet to be assessed as a solar farm use, and at this time Louisa County has not determined precisely how much property tax revenue Wapello Solar will generate. However, in the application to the Iowa Utilities Board by Wapello Solar, LLC, it was forecasted that Wapello Solar would roughly triple historical property taxes for the included parcels and property tax revenue would be expected to be in the range of \$120,000 to \$130,000 per year for the 25 years of planned operation.

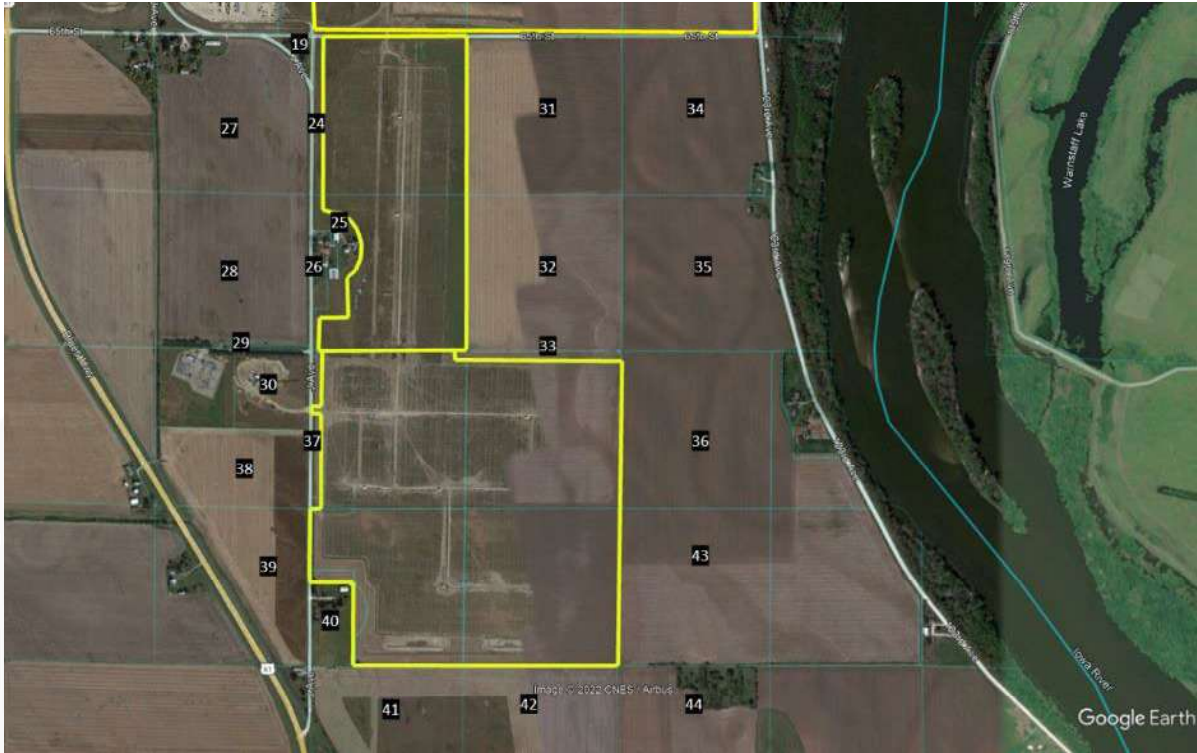
The parcels included in the Wapello Solar project have been classified as commercial parcels and have assessed values of \$0 and \$0 in net taxes due since the 2021 tax year.

The following maps display the parcels developed with the solar farm (outlined in yellow). Properties immediately adjoining the solar parcels (outlined in blue) are numbered for subsequent analysis. It is noted that the aerial imagery provided by Google Earth is dated October 2020, prior to the completion of the solar farm.



Wapello Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Wapello Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

PAIRED SALES ANALYSIS

One adjoining residential property, Adjoining Property 10, was sold on July 9, 2021, which was after the solar farm was built and became operational. We spoke to the selling broker, Julie Rossiter of Julie Rossiter Realty, who noted **the property sold very quickly after receiving multiple offers within the first day of being listed on the market.** Additionally, Ms. Rossiter said that **she did not have to make any adjustments to her standard marketing plan to attract potential buyers, who in Ms. Rossiter's opinion, did not mind the solar farm being located adjacent to the property.**

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 10 to the Wapello Solar project was considered for a paired sales analysis, and we have analyzed this property as single-family home use in Group 1. The property is a single-story, 1,640 square foot home with a finished basement, attached garage, pole building and a shed, located on a 3.75-acre lot and sold in July 2021. The improvements on this property is located approximately 180 feet to the nearest solar panel while the property line is approximately 130 feet to the nearest solar panel and is surrounded on two sides by the Wapello Solar project. The following table outlines the other important characteristics of Adjoining Property 10.

SUMMARY OF TEST AREA SALE Group 1 - Wapello Solar Farm										
Adj .Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
10	6975 J Avenue, Wapello, IA 52653	\$215,500	3	1.75	1963	1,640	1-story SFH, Finished Basement, Attached Garage, Pole Building, Shed	3.75	\$131.40	Jul-21



Adjoining Property 10, Test Area Sale Group 1, Wapello Solar



Adjoining Property 10, Test Area Sale Group 1, Wapello Solar

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

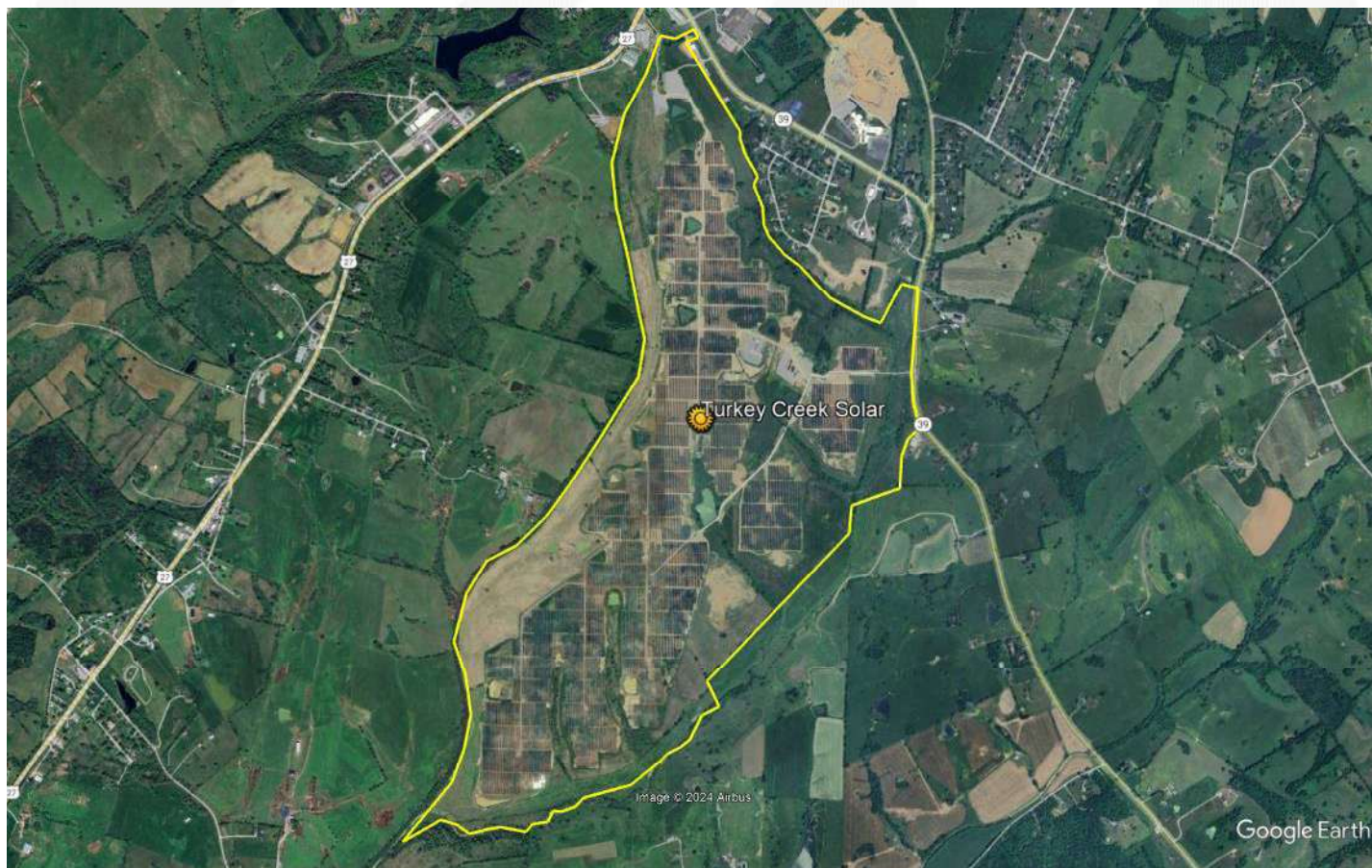
We analyzed six Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the median sale date of the Test Area Sales in Group 1. The Control Area Sales for Group 1 are single-family homes with two to four bedrooms and one to two baths, consist of between 1,296 square feet and 2,172 square feet of gross living area, and built between 1952 and 1977. The Control Area Sales also have finished basements, garage parking and are located on lots inbetween 1.5 and 5.4-acres in size.

Control Area Sale data was obtained through the Louisa County Assessor Database. The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Wapello Solar Project – Group 1 is presented below.

CohnReznick Paired Sale Analysis Wapello Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$131.40
Control Area Sales (6)	No: Not adjoining solar farm	\$131.08
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		0.25%

Noting no negative price differential, with Adjoining Property 10 having a slightly higher unit sale price than the Control Area Sales, it does not appear that the Wapello Solar installation impacted the sale price of the Test Area Sale.

The median days on market for the Control Area was sales was 50 days (ranging from 41 to 74 days), while Adjoining Property 10 sold after 78 days on market. However, Adjoining Property 10 was listed for \$199,000 and ultimately sold for \$215,500 or a 8.29% increase from the list price.

SOLAR FARM 8: TURKEY CREEK SOLAR FARM, GARRARD COUNTY, KENTUCKY**Coordinates:** Latitude 37.592994, Longitude -84.56797**PINs:** 28-105, 28-103, 28-095**Total Land Size:** Approximately 753 Acres**Population Density (2022):** 76 people per square mile (Garrard County)**Date Project Announced:** February 2020**Date Project Completed:** November 2022**Output:** 50 MW AC**Date Study Completed:** December 2024

Approximate Turkey Creek Solar boundaries outlined in yellow, aerial imagery provided by Google Earth dated May 2023

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The Turkey Creek Solar Farm ("Turkey Creek Solar" or "the Project") use is located in Garrard County, Kentucky. The solar farm is located in between U.S. Highway 27 to the west and north, State Route 39 to the east and north and Gilberts Creek Road to the south.

The current owner of the solar farm is Carolina Solar Energy and is operated by Silicon Ranch Corporation, who also developed the Project. The solar farm went into operation in November 2022 and provides energy for customers of PJM Interconnection. The Project is the largest utility-scale solar farm in central Kentucky and generates enough energy to power approximately 9,000 homes annually.

The farmland under the solar arrays of Turkey Creek Solar is currently managed by a local sheep rancher who is able to utilize the land for grazing, which prevents vegetation from overgrowth and interfering with energy production. This example of agrivoltaics improves the health of the soil and helps the ecosystem function while also providing shade for grazing sheep.

The Surrounding Area: The Turkey Creek Solar installation is located in western Garrard County, Kentucky, immediately to the south of the City of Lancaster, and approximately 30 miles south of the City of Lexington, in central Kentucky. The solar site is approximately 75 miles southeast of the City of Louisville and 100 miles south of the City of Cincinnati, Ohio.

As of July 2025, the Turkey Creek Solar project is one of the 17 solar farms in Kentucky and is the only solar farm located within Garrard County. The Turkey Creek Solar project is the sixth largest solar farm in the state with the largest being the 200 MW Green River Solar Farm in Meade County, which became operational in May 2025.

The Immediate Area: The solar farm spans over 750 acres in Garrard County and is immediately surrounded by primarily single-family residential properties, agricultural land with a small number of industrial uses interspersed throughout the surrounding Project area. The solar farm is situated on three parcels, all owned by the operator of the Project, Silicon Ranch Corporation. The Turkey Creek Solar project is surrounded by landscaped vegetative buffers of evergreen shrubs that were approximately 15 feet wide and at least three feet in height at the time of planting.

To the north lies more densely concentrated residential properties in the City of Lancaster, within one mile from the Project site.

Real Estate Tax Info: Prior to the development of the solar farm in 2021, the assessed value of the underlying land was \$371,000 and participating land owners paid \$4,182 in real estate taxes. In 2022, after the completion of the solar farm, the assessed value of the underlying land increased 996 percent to \$4,065,120 and real estate taxes increased 973 percent to \$44,891.

Pin	Acres	2022 Taxes Paid	2021 Taxes Paid	Tax Increase	2022 Assessed Value	2021 Assessed Value	Value Increase
Garrard County, KY							
28-105	263.4	\$15,848	\$1,296	1,122%	\$1,435,120	\$115,000	1,148%
28-103	294.6	\$17,868	\$2,029	781%	\$1,618,000	\$180,000	799%
28-095	194.7	\$11,176	\$857	1,204%	\$1,012,000	\$76,000	1,232%
28-095.01	0.7	\$6	-	-	\$500	-	-
Total	752.7	\$44,891	\$4,182	973%	\$4,065,120	\$371,000	996%

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The following maps display the parcels developed with the solar farm (outlined in yellow). Properties immediately adjoining the solar parcels (green pins) are numbered for subsequent analysis. It is noted that the aerial imagery provided by Google Earth is dated May 2023.

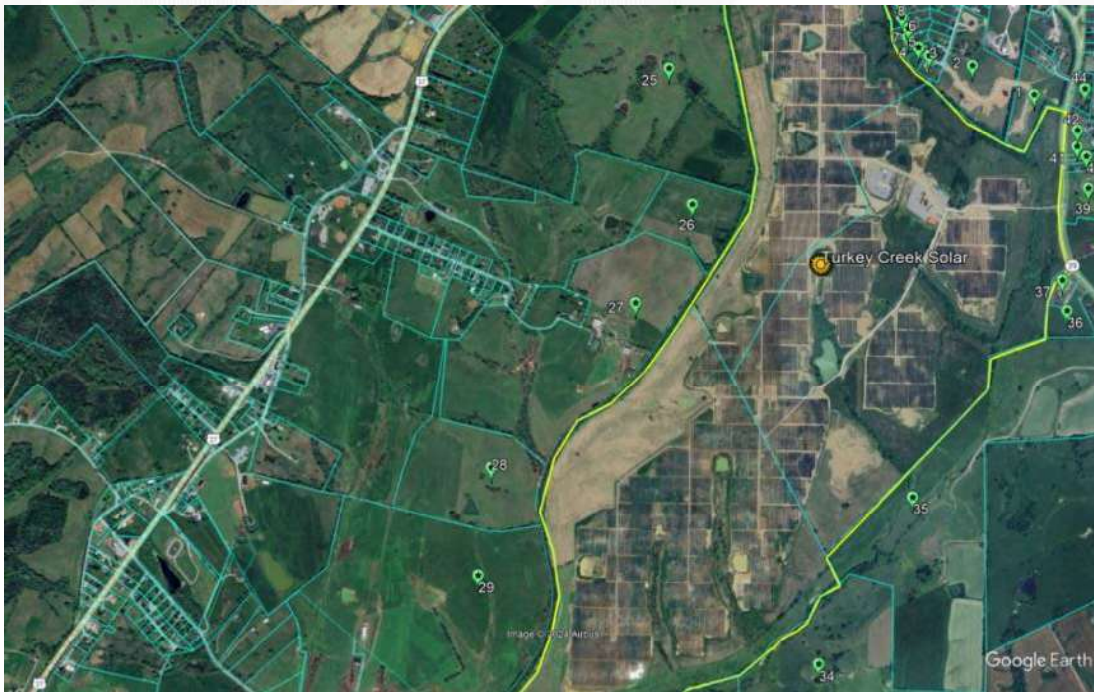


Turkey Creek Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Turkey Creek Solar – Adjoining Properties, Elmwood Court Subdivision



Turkey Creek Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Turkey Creek Solar – Adjoining Properties



Turkey Creek Solar – Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

PAIRED SALES ANALYSIS

In reviewing Adjoining Properties to study in a Paired Sales Analysis, one property and sale was considered but eliminated from further consideration as discussed below.

Adjoining Property 25 was sold on June 27, 2023 for \$1,300,000 or \$382.35 per square foot of living area, after being on the market for 70 days. Adjoining Property 25 consisted of a 2-Story SFH with a 2-car attached garage and partial unfinished basement built in 1954 on a 206-acre lot. Adjoining Property 26 also consists of three barns and approximately 75 to 80 percent of the land is open pasture land. We spoke with the listing broker, Cliff-Ed Irvin, who noted that a portion of the property that fronts U.S. Highway 27 has the potential for commercial development, which impacted the sale price. Mr. Irvin also stated that it was hard to justify whether or not the solar farm impacted the sale price of Adjoining Property 25 and if there was any impact, it was negligible. Additionally, the large land size of Adjoining Property 25 limited the amount of comparable properties to conduct a paired sales analysis. For these reasons, we have excluded Adjoining Property 25 from further analysis.

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 2.1 to the Turkey Solar Project was considered for a paired sales analysis, and we have analyzed this property as a single-family home use in Group 1. The property is a recently constructed, single-story 1,600 square foot home with a two car attached garage, located on a 1.01-acre lot that sold in June 2024. This property line is approximately 660 feet from the closest solar panel, and the improvements are approximately 700 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 2.1.

SUMMARY OF TEST AREA SALE Group 1 - Turkey Creek Solar										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
2.1	239 Ashlock Drive	\$329,900	3	2.5	2024	1,600	1-Story SFH with 2-Car Attached Garage	1.01	\$206.19	Jun-24

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Test Area Sale 1 (Adjoining Property 2.1), aerial imagery provided by Google Earth, dated May 2023 (prior to construction of home)

We analyzed eight Control Area Sales of single-family homes with similar construction and use that were located within Garrard County and that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 1. The Control Area Sales for Group 1 are single-family homes located on lots in between 0.59 and 1.54-acres in size with three to four bedrooms and two to two and a half baths, consisting of between 1,373 square feet and 2,100 square feet of gross living area, and built between 2017 and 2023.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Turkey Creek Solar Project – Group 1 is presented below.

CohnReznick Paired Sale Analysis SR Turkey Creek Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$206.19
Control Area Sales (8)	No: Not adjoining solar farm	\$205.58
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		0.30%

Noting no negative marketing time differential, the Test Area Sale sold in 62 days, while the Control Area Sales sold between 40 and 183 days, with a median time on market of 74 days.

Noting no negative price differential, and therefore it does not appear that the Turkey Creek Solar installation impacted the sale price of the Test Area Sale.

Group 2 – Vacant Single-Family Residential Lot

Adjoining Properties 2.8 and 2.17 to the Turkey Solar Project were considered for a paired sales analysis, and we have analyzed these properties as vacant residential lot uses in Group 2. The properties are located within the Elmwood Court subdivision, which consists of 17 homesites ranging from 1-acre to 2.6-acres. All homesites within the Elmwood Court subdivision are deed restricted to ensure a high quality neighborhood and the subdivision is conveniently located less than one-half mile to Garrard County High School. The properties are vacant residential lots at 1.02-acres and 1.38-acres that sold in January 2023 and November 2023. The property lines are approximately 345 to 485 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Properties 2.8 and 2.17.

SUMMARY OF TEST AREA SALE Group 2 - Turkey Creek Solar						
Adj. Property #	Parcel ID	Sale Price	Use	Site Size (AC)	Sale Price / Acre	Sale Date
2.8	28C-03-004.07	\$44,900	Vacant Residential Lot	1.02	\$44,020	Jan-23
2.17	28C-03-006.07	\$50,000	Vacant Residential Lot	1.38	\$36,364	Nov-23

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Test Area Sales 1 (Adjoining Property 2.8) and 2 (Adjoining Property 2.17), aerial imagery provided by Google Earth, dated May 2023

We analyzed 17 Control Area Sales of vacant residential lots that were located within Garrard County and that sold within a reasonable time frame from the sale date of the Test Area Sales in Group 2. The Control Area Sales for Group 2 are vacant residential lots in between 1.00 and 1.40-acres in size and are all located within a subdivision.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Turkey Creek Solar Project – Group 2 is presented below.

CohnReznick Paired Sale Analysis SR Turkey Creek Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per Acre
Test Area Sale (2)	Adjoining solar farm	\$40,192
Control Area Sales (17)	No: Not adjoining solar farm	\$30,272
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		32.77%

Noting no negative price differential, and therefore it does not appear that the Turkey Creek Solar installation impacted the sale price of the Test Area Sales.

Group 3 – Vacant Single-Family Residential Lot

Adjoining Property 2.9 to the Turkey Solar Project were considered for a paired sales analysis, and we have analyzed this property as vacant residential lot uses in Group 3. The property is located within the Elmwood Court subdivision, which consists of 17 homesites ranging from 1-acre to 2.6-acres. All homesites within the Elmwood Court subdivision are deed restricted to ensure a high quality neighborhood and the subdivision is conveniently located less than one-half mile to Garrard County High School. The property is a vacant residential lot consisting of 2.60-acres that sold in July 2023. The property line is approximately 465 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 2.9.

SUMMARY OF TEST AREA SALE Group 3 - Turkey Creek Solar						
Property #	Parcel ID	Sale Price	Use	Site Size (AC)	Sale Price / Acre	Sale Date
2.9	28C-03-004.08	\$60,800	Vacant Residential Lot	2.60	\$23,349	Jul-23

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Test Area Sale 3 (Adjoining Property 2.9), aerial imagery provided by Google Earth, dated May 2023

We analyzed 15 Control Area Sales of vacant residential lots that were located within Garrard County and that sold within a reasonable time frame from the sale date of the Test Area Sale in Group 3. The Control Area Sales for Group 3 are vacant residential lots in between 1.38 and 4.60-acres in size and are all located within a subdivision.

The Control Area Sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeated-sales index measuring the average price changes in repeat sales or refinancing of the same properties. The result of our analysis for the Turkey Creek Solar Project – Group 3 is presented below.

CohnReznick Paired Sale Analysis SR Turkey Creek Group 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price per Acre
Test Area Sale (1)	Adjoining solar farm	\$23,349
Control Area Sales (15)	No: Not adjoining solar farm	\$22,038
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		5.95%

Noting no negative price differential, and therefore it does not appear that the Turkey Creek Solar installation impacted the sale price of the Test Area Sale.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

SOLAR FARM 9: GRAND RIDGE SOLAR FARM, LASALLE COUNTY, ILLINOIS**Coordinates:** Latitude 41.143421, Longitude -88.758340**PINs:** 34-22-100-000, 34-22-101-000**Total Land Size:** 158 acres**Date Project Announced:** December 31, 2010**Date Project Completed:** July 2012**Output:** 20 MW AC**Date Study Completed:** August 2020**Date Study Updated:** December 2021

This solar farm is located in the southeast quadrant of the intersection of E. 21st and N. 15th Roads, near Streator, in LaSalle County, Illinois. The solar farm was developed by Invenergy and is part of a renewable energy center known as Grand Ridge. The Energy Center includes the 20 MW AC solar facility, a 210 MW wind farm, and a 36 MW advanced-energy storage facility, all in one local vicinity. The solar site is located adjacent to the south and west of Invenergy's wind farm.

The solar facility consists of twenty individual 1-MW solar inverters and over 155,000 photovoltaic modules manufactured by General Electric.

The Surrounding Area: The Grand Ridge Solar Farm is situated just outside of the City of Streator, in Otter Creek Township, in LaSalle County, Illinois. The solar farm is located in a primarily rural part of Illinois, with the nearest interstate, Interstate-55, located approximately 14 miles southeast of the site.

The Immediate Area: Within a one-mile radius of the solar farm, surrounding uses mainly consist of agricultural land, with some single-family homes to the west. All of the adjacent land parcels to the solar farm are used for agricultural and/or residential purposes.

The solar site is surrounded by row crops to the north adjoining N. 15th Road. Row crops also adjoin the solar arrays to the east. Scrub shrubbery exists on the western border of the solar site, along E. 21st Road. On the west side of E. 21st Road is the 28-acre private Sandy Ford Sportsmans Club that includes a 12-acre fishing lake. The private Lazy Acres Fishing Club adjoins the solar site to the south and is surrounded by mature trees.

Real Estate Tax Information: Prior to development of the solar farm, in 2011, the owner of this 158-acre site paid real estate taxes of \$3,000 annually. In the year following the solar farm development, 2012, real estate taxes increased to approximately \$240,000, a 7,791 percent increase in tax revenue for the site.

PIN	Acres	2011 Taxes Paid	2012 Taxes Paid	Tax Increase	2011 Assessed Value	2012 Assessed Value	Value Increase
LaSalle County, IL							
34-22-100-000	78.99	\$ 1,580	\$ 120,064	7501%	\$ 23,830	\$ 1,812,357	7505%
34-22-101-000	78.80	\$ 1,457	\$ 119,539	8106%	\$ 21,975	\$ 1,804,433	8111%
TOTAL	157.79	\$ 3,036	\$ 239,602	7791%	\$ 45,805	\$ 3,616,790	7796%

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The map below displays the parcels in the solar farm site (outlined in red). Properties adjoining the solar parcels are numbered for subsequent analysis.



Grand Ridge Solar - Adjoining Properties

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

The surrounding area is primarily populated with agricultural uses. Some of these agricultural parcels contain homesteads on the site and others are fully unimproved.

Adjoining Properties 1,3, 5-7, 13, and 14 have no sales data. Therefore, Adjoining Properties 1,3, 5-7, 13, and 14 are excluded from further analysis.

Recall, the solar farm under analysis was announced on December 31, 2010 and began operations in July 2012. Adjoining Properties 8 and 9 were sold in 1997 and 1996, respectively. These sales did not occur within a reasonable time period prior to announcement/completion. Therefore, Adjoining Properties 8 and 9 were excluded from further analysis.

Adjoining Property 4 sold in March 2011 while construction was ongoing. However, we have not considered this property for a paired sales analysis because the impact of being proximate to the solar farm could not be differentiated from the impact of the construction. Therefore, Adjoining Property 4 was excluded from further analysis.

Adjoining Property 2 transferred in September of 2018 with no consideration amount on a Trustee's deed from Gemini Farms LLC to Bedeker Family Gift Trust. John and Susan Bedeker are owners of the Adjoining Property 1 which is adjacent. This is not considered an arm's length transaction. Therefore, Adjoining Property 2 was excluded from further analysis.

Adjoining Properties 11 and 12 were initially one parcel of 37.07 acres. Adjoining Property 12 sold in October 2016, which is a reasonable time period after completion of the solar farm. When Adjoining Property 12 was sold, the parcel was split into the two-acre homesite, and the 35.07 acre farm, which the Kmetz Trust retained ownership of that 35 acre farm. Therefore, we have excluded Adjoining Property 11 and only considered Adjoining Property 12 (Test Area Sale) for paired sales analysis.

PAIRED SALES ANALYSIS

We have considered only one type of paired sales analysis, which was comparing sales of properties proximate to the solar farm (Control Area) to the sales of adjoining properties after the completion of the solar farm project (Test Area). We were unable to compare any sales of adjoining properties that occurred prior to the announcement of the solar farm with the sales of the adjoining properties after the completion of the solar farm project as there were no adjoining properties that sold prior to the announcement of the solar farm, within a reasonable period of time.

Adjoining Property 12 (Test Area Sale) was considered for a paired sales analysis, and we analyzed this property as a single-family home use, which is a 2,328 square foot home located on a 2.0- acre parcel that sold in October 2016. This parcel is approximately 366 feet from the closest solar panel, and the improvements are approximately 479 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 12.

Grand Ridge Solar Farm Test Area Sale - Adjoining Property 12										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price/SF	Sale Date
Adjoining Property 12	2098 N 15th Rd, Streator, IL	\$186,000	3	4.0	1997	2,328	Single Family Home and Garage and Farm Acreage	2.0	\$79.90	Oct-16

We have found Control Area Sale data through the Northern Illinois Multiple Listing Service (MLS) and verified these sales through county records, conversations with brokers, and the County Assessor's Office. We excluded sales that were not arm's length, such as REO sales or those between related parties. We have excluded any home sites under one acre and included only sales with a similar quantity of bedrooms, bathrooms, and living area. The Control Area Sales sit on more than one acre of land and sold within a reasonable time frame from the sale date of the Test Area Sale and are similar to the Test Area Sale in physical characteristics.

It is important to note that these Control Area Sales are not adjoining to any solar farm, nor do they have a view of one from the property. Therefore, the announcement nor the completion of the solar farm use could not have impacted the sales price of these properties. It is informative to note that the average marketing time (from list date to closing date) for Control Area Sales of 171 days is consistent with the marketing time for Adjacent Property 12 of 169 days. This is an indication that the marketability of the Test Area Sales was not negatively influenced by proximity to the Solar Farm. The Control Area Sales are comparable in most physical characteristics and bracket Adjoining Property 12 reasonably.

We analyzed the five Control Area Sales illustrated above and adjusted the Control Area Sales for market conditions using a regression analysis to identify the appropriate monthly market conditions adjustment. The results of the paired sales analysis for the Grand Ridge Solar Farm are presented on the following page.

CohnReznick Paired Sales Analysis Grand Ridge Solar Farm Adjoining Property 12		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Yes: Adjoining solar farm	\$79.90
Control Area Sales (5)	No: Not adjoining solar farm	\$74.35
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		7.46%

The unit sale price of the Test Area Sale was slightly higher than the median adjusted unit sale price of the Control Area Sales.

We contacted the selling broker of the Test Area Sale home, Tina Sergenti with Coldwell Banker, who said that the proximity of the solar farm had no impact on the marketing time or selling price of the home. The Test Area

Sale sold with 169 (5 – 6 months) days on market compared to the control sales, which sold between 10 – 471 days on market (0 and 16 months) on market.

Noting no negative price differential, it does not appear that the Grand Ridge Solar Farm impacted the sales price of the Test Sale, Adjoining Property 12. This was confirmed by the real estate agent who marketed and sold this home.

TECHNIQUE 3: MARKET COMMENTARY

Additionally, we have contacted market participants such as appraisers, brokers, and developers familiar with property values around solar farms. Commentary from our conversations with these market participants is recorded below.

We spoke with Rachel Hamblin, Deputy Assessor of White County, Illinois, where the **Big River Solar Farm** and **Boomtown Renewable Energy Center** are located and she stated that they have not observed any trends to indicate an impact to property values due to their proximity to solar facilities. Additionally, Ms. Hamblin noted that they have not received any property assessment appeals due to proximity to the solar farms. (August 2025)

In Otter Creek Township, in LaSalle County, Illinois, we spoke with Viki Crouch, the Township Assessor, who she said that there has been no impact on property values due to their proximity to the **Grand Ridge Solar Farm**.

Shaun Harner, Deputy Assessor of McLean County, Illinois where three community-scale solar farms are located, noted that there have been no modifications to the assessment process of homes in close proximity to solar facilities and they have not noticed any differences in sale price trends. (August 2025)

Iris Shaw, Deputy Assessor of Will County, Illinois, where sixteen community-scale solar farms are in operation, stated that Will County has not changed the assessment methodology for homes adjacent to existing solar projects and no one has filed for reductions in assessed values due to being near solar facilities. (August 2025)

We spoke to Chad Coady, Chief County Assessment Officer for Christian County, Illinois, he stated they've seen no trends that indicate solar facilities have an impact on proximity property values in Christian County. (September 2025)

We spoke with Ken Crowley, Rockford Township Assessor in Winnebago County, Illinois, who stated that he has seen no impact on property values in his township as an effect of proximity to the **Rockford Solar Farm**.

We spoke with James Weisiger, the Champaign Township Assessor in Champaign County, Illinois, where the **University of Illinois Solar Farm** is located and he noted that no one has petitioned to have their property assessments lowered and there appears to have been no impact on property values as a result of proximity to the solar farm.

Angie Dieterman, the Chief County Assessment Officer in Stephenson County, Illinois, where nine solar farms have been constructed since 2020, stated that there has been no impact on property values due to their proximity to any of the solar farms.

Cindi Lotz, a Fayette County, Illinois Assessor, stated that the **Dressor Plains Solar** project has not had an impact on property values or caused an increase in property assessment appeals due to proximity to the solar farm.

Cami Grossenbacher, Stephenson County, Illinois Deputy Assessor, stated that there has been no impact on property values due to their proximity to the **2662 Freeport Solar CSG** project.

Robert Glueckert, Chief County Assessor of Lake County Illinois stated that there is still not enough data and that the verdict is still out. Too early to tell if any impact.

Alejandro Benitez, Chief County Assessor of McHenry County Illinois stated that there isn't enough data to determine if solar farms affect adjacent property values.

We spoke to Tricia Black, Supervisor of Assessments of Ogle County, Illinois has not seen any trends that solar projects are impacting property values or increasing requests for assessment reductions.

Ted Droeste, assessor of Delta Township, Michigan has the Delta Solar Power facility in his district that was completed in 2018. He indicated that he has been actively tracking sales of properties surrounding the solar facility and stated that properties have sold fast, at market or above market and he had no evidence of declining value. Mr. Droeste stated that they have not adjusted assessed values for properties surrounding the solar panels.

A Clark County, Kentucky Property Valuation Administrator, Jason Neely, noted there have been no complaints regarding East Kentucky Power Cooperative, Inc.'s Cooperative Solar One project installed in November 2017 located in the county, which has a capacity to generate 8.5 MW of electricity. Additionally, Neely stated he has not seen any evidence of lowered property values in the area and no reduction in assessed property values has been made due to proximity to the solar farm.

A Grant County, Kentucky Assessor stated that they have not seen a reduction in assessed property values or market values for adjacency to solar farms.

A McNairy County, Tennessee Assessor stated that they have not applied reductions to assessed value for adjacency to solar farms.

Christy Wingate, a real estate broker with Parker Real Estate Group, noted in her experience, the presence of a solar farm is neither an attraction nor a deterrent for nearby home buyers.

A Miami Dade County, Florida Assessor stated that they do not reduce assessed property values for adjacency to Solar Farms.

A Putnam County, Florida Assessor stated that they have not seen a reduction in assessed value for adjacency to Solar Farms.

Renee Davis, Tax Administrator for Bladen County, North Carolina, stated that she has not seen any effect on property values due to proximity to a solar farm.

We spoke with Jim Brown, an appraiser for Scotland County, North Carolina, who stated that he has seen no effect on property values due to proximity to a solar farm.

We spoke with Gary Rose, a tax assessor for Duplin County, North Carolina, who stated that he has seen no effect on property values in regards to proximity to a solar farm.

Kathy Renn, a property Valuation Manager for Vance County, North Carolina, stated that she has not noticed any effect on property values due to proximity to a solar farm.

Larry Newton, a Tax Assessor for Anson County, North Carolina, stated that there are six solar farms in the county ranging from 20 to 40 acres and he has not seen any evidence that solar farms have had any effect on property values due to proximity to a solar farm.

We spoke with Patrice Stewart, a Tax Administrator for Pasquotank County, North Carolina, and she has seen no effect on land or residential property values due to proximity to the solar farms in Pasquotank County.

We spoke with the selling broker of the Adjoining Property for Elm City Solar, in North Carolina, Selby Brewer, who said the solar farm did not impact the buyer's motivation.

We spoke with Amy Carr, Commissioner of Revenue in Southampton County, Virginia, who stated that most of the solar farms are in rural areas, but she has not seen any effect or made any adjustments on property values. They have evaluated the solar farmland considering a more intense use, which increased the assessed value.

The Interim Assessor for the town of Whitestown in Oneida County, New York, Frank Donato, stated that he has seen no impact on property values of properties nearby solar farms.

Steve Lehr at the Department of Assessment for Tompkins County, New York, mentioned that the appraisal staff has made no adjustments regarding assessed values of properties surrounding solar farms. Marketing times for properties have also stayed consistent. Lehr noted that a few of the solar farms in Tompkins County are on land owned by colleges and universities and a few are in rural areas.

At this point in time, Al Fiorille, Senior Valuation Specialist in the Tompkins County Assessment department in New York, reported that he cannot measure any negativity from the solar farms and arrays that have been installed within the county.

Mason Hass, the Riverhead Assessor in Suffolk County, on Long Island, New York stated that the solar farms in his town are in industrial zoned areas, and he has not seen any impact on adjacent properties.

The Assessor for the town of Smithtown in Suffolk County, New York, Irene Rice, has not seen any impact on property values as a result of their location near the newly built solar farms in her town.

In the Assessor's office in the town of Seneca, Ontario County, New York, Shana Jo Hamilton stated that she has seen no impact on property values of properties adjacent to solar farms.

Michael Zazzara, Assessor of the City of Rochester in Monroe County, New York commented that the City has a couple of solar farms, and they have seen no impact on nearby property values and have received no complaints from property owners.

While there are one or two homes nearby to existing solar farms in the town of Lisbon in St. Lawrence County, New York, Assessor Stephen Teele has not seen any impact on property values in his town. The solar farms in the area are in rural or agricultural areas in and around Lisbon.

The Assessor for the Village of Whitehall in Washington County, New York, Bruce Caza, noted that there are solar farms located in both rural and residential areas in the village and he has seen no impact on adjacent properties, including any concerns related to glare from solar panels.

Laurie Lambertson, the Town Assessor for Bethlehem, in Albany County, New York noted that the solar farms in her area are tucked away in rural or industrial areas. Lambertson has seen no impact on property values in properties adjacent to solar farms.

We spoke with Ken Surface, a Senior Vice President of Nexus Group. Nexus Group is a large valuation group in Indiana and has been hired by 20 counties in Indiana regarding property assessments. Mr. Surface is familiar with the solar farm sites in Harrison County (Lanesville Solar Farm) and Monroe County (Ellettsville Solar Farm) and stated he has noticed no impact on property values from proximity to these sites.

We interviewed Missy Tetrick, a Commercial Valuation Analyst for the Marion County Indiana Assessor. She mentioned the Indy Solar III sites and stated that she saw no impact on land or property prices from proximity to this solar farm.

We spoke with Dorene Greiwe, Decatur County Indiana Assessor, and she stated that solar farms have only been in the county a couple of years, but she has seen no impact on land or property prices due to proximity to this solar farm.

Connie Gardner, First Deputy Assessor for Madison County Indiana, stated that there are three solar farms in her county, and she has seen no impact on land or property prices due to proximity to these solar farms.

We spoke with Tara Shaver, Director of Administration for Marion County, Indiana Assessor/Certified Assessor, and she stated that she has seen no impact on land or property prices due to proximity to solar farms.

Candace Rindahl of ReMax Results, a real estate broker with 16 years of experience in the North Branch, Minnesota area, said that she has been in most of the homes surrounding the North Star Solar Farm and personally sold two of them. She reported that the neighboring homes sold at market rates comparable to other homes in the area not influenced by the solar farm, and they sold within 45 days of offering, at the end of 2017, which was in line with the market.

Dan Squires, Chisago County Tax Assessor, confirmed that the Chisago County Assessor's Office completed their own study on property values adjacent to and in close vicinity to the solar farm from January 2016 to October 2017. From the study, the assessor determined the residential homes adjacent to the North Star Solar Farm were in-line with the market and were appreciating at the same rate as the market.²²

²² Chisago County Press: County Board Real Estate Update Shows No "Solar Effects" (11/03/2017)

SOLAR FARM FACTORS ON HARMONY OF USE

Zoning changes and conditional use permits often require that the proposed use is compatible with surrounding uses.

The following section analyzes specific physical characteristics of solar farms and is based on research and CohnReznick's personal solar farm site visits and indicate that solar farms are generally harmonious with surrounding property and compliant with most zoning standards.

Appearance: Most solar panels have a similar appearance to a greenhouse or single-story residence can range from 8 to 20 feet but are usually not more than 15 feet high. As previously mentioned, developers generally surround a solar farm with a fence and often leave existing perimeter foliage, which minimizes the visibility of the solar farm. The physical characteristics of solar farms are compatible with adjoining agricultural and residential uses.

Sound: Solar panels in general are effectively silent and sound levels are minimal, like ambient sound. There are limited sound-emitting pieces of equipment on-site, which only produce a quiet hum (e.g., substation). However, these sources are not typically heard outside the solar farm perimeter fence.

Odor: Solar panels do not produce any byproduct or odor.

Greenhouse Gas (GHG) Emissions: Much of the GHG produced in the United States is linked to the combustion of fossil fuels, such as coal, natural gas, and petroleum, for energy use. Generating renewable energy from operating solar panels for energy use does not have significant GHG emissions, promoting cleaner air and reducing carbon dioxide (CO₂) emissions to fight climate change.

Traffic: The solar farm requires minimal daily onsite monitoring by operational employees and thus minimal operational traffic.

Hazardous Material: Modern solar panel arrays are constructed to U.S. government standards. Testing shows that modern solar modules are both safe to dispose of in landfills and are also safe in worst case conditions of abandonment or damage in a disaster.²³ Reuse or recycling of materials would be prioritized over disposal. Recycling is an area of significant focus in the solar industry, and programs for both batteries and solar panels are advancing every year. While the exact method of recycling may not be known yet as it is dependent on specific design and manufacturer protocol, the equipment is designed with recyclability of its components in mind, and it is likely that solar panel and battery energy storage recycling and reuse programs will only improve in 25 years' time.

Agrivoltaics: The land underlying solar farms can serve multiple uses, increasing land-use efficiency, such as growing native plants beneath solar panels or grazing sheep amongst rows of solar panels. Agrivoltaics can further be defined as a farming method that aims to maximize land use by pairing solar panels with cropland,

²³ Virginia Solar Initiative - Weldon Cooper Center for Public Service – University of Virginia
(<https://solar.coopercenter.org/taxonomy/term/5311>)

thus minimizing competition between energy production and food.²⁴ Scientists from the Department of Energy's Agronne National Laboratory in Illinois and the National Renewable Energy Laboratory in Colorado conducted tests on two different solar installations in Minnesota that were built on 76 acres of farmland. The land beneath the solar panels was seeded with numerous species of native grasses and flowers, then allowed to grow for one year. The following years, the two sites were visited four times each summer during peak flower season to track the number and type of insects attracted to the newly planted vegetation. After five years of tracking, the population of native bees increased more than 20 times and adjacent soybean farms experienced an increase in bees and other pollinators. Testing shows that if sited properly, habitat-friendly solar energy can be a feasible way to safeguard insect populations and can improve the pollination services in adjacent agricultural fields.²⁵

Examples of homes built adjoining to solar farms are presented on the following pages.

²⁴ (Bryce, Anthropocene Magazine, 2023) ([Solar panels handle heat better when combined with crops \(anthropocenemagazine.org\)](https://anthropocenemagazine.org/solar-panels-handle-heat-better-when-combined-with-crops/))

²⁵ (Cornwall, Solar Farms Could Come with a Pollinator Bonus, 2024) ([Solar farms could come with a pollinator bonus \(anthropocenemagazine.org\)](https://anthropocenemagazine.org/solar-farms-could-come-with-a-pollinator-bonus/))

For the Dominion Indy III solar farm, the adjacent land to the west was acquired and subsequently developed with a large estate home – after the solar panels had been in operation for years.



*Dominion Indy III Solar Farm
September 2014*



*Dominion Indy III Solar Farm
October 2016*



Estate home adjacent to Dominion Indy III Solar Farm

In ground pool and attached garage (home cost estimated at \$450,000 - October 2015)

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



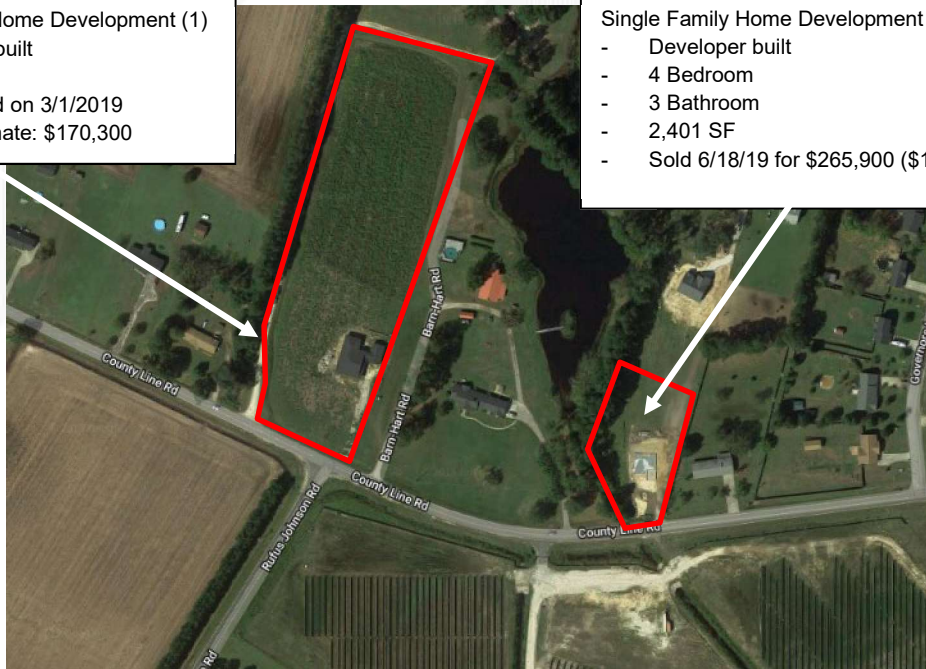
Innovative Solar 42 (2017)
Cumberland County, NC

Single Family Home Development (1)

- End-user built
- 2,933 SF
- Completed on 3/1/2019
- Cost estimate: \$170,300

Single Family Home Development (2)

- Developer built
- 4 Bedroom
- 3 Bathroom
- 2,401 SF
- Sold 6/18/19 for \$265,900 (\$110.75/sf)



Innovative Solar 42 (2019)
Cumberland County, NC

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Developer Built Home

Sold 6/18/19 for \$265,900 (\$110.75/sf)

Cumberland County, NC (adjacent to Innovative 42 solar farm)

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Portage Solar Farm located in Indiana



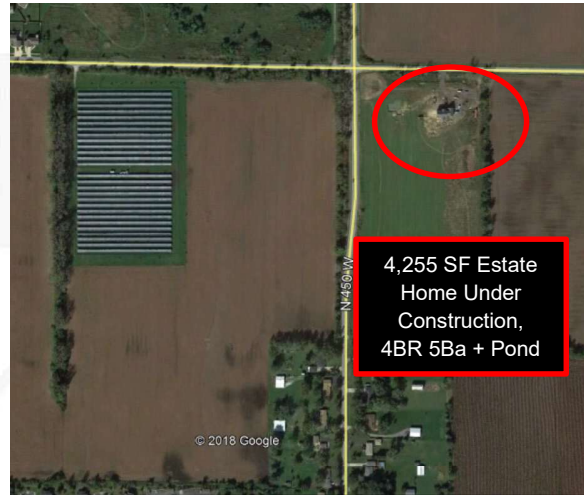
A new 175-home subdivision is currently under construction adjacent to the 1.5 MW Portage Solar Farm in Porter County, Indiana. The solar facility was completed in November 2011, and Lennar began construction on the Brookside Subdivision in 2022, with the first homes selling in March 2023. The subdivision is 100 feet from the panels. As of June 2024, there have been 90 closed sales, ranging from \$274,990 to \$454,675, or \$105.00 to \$220.54 PSF, with an average of \$364,990 or \$161.00 PSF. Every house along the boundary with the solar farm sold, with an average price of \$387,664 or \$167.00 PSF, or 3.75% higher. There are 14 active listings, ranging from \$374,990 to \$433,990.

On the next page, we show the same Portage Solar Farm and a newly constructed home to the east of the solar facility, completed in 2016.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



*Portage Solar Farm, IN
October 2015*



*Portage Solar Farm, IN
October 2016*



*4,255 square foot estate home under construction, adjacent to Portage Solar Farm located in Indiana
On-site pond and attached garage (cost estimated at \$465,000) April 2018*

The Brighton PV Solar farm became operational in December 2012. Located in Adams County, north of Denver, CO, this solar farm has a capacity of 1.8 MW AC and is located on a triangular parcel of land east of an area of existing custom-built estate homes. A photo of one home (15880 Jackson Street) located directly north of the circled area below is presented to the right.



In December 2012, the 2.55-acre lot encircled in red below (15840 Jackson Street) was purchased for future development of a single-family home. This home was built in 2017, and per the county assessor, the two-story home is 3,725 square feet above ground with 4 bedrooms and 3.5 bathrooms. According to the building permit issued in August 2016, the construction cost was budgeted at \$410,000.



*Brighton PV Solar, Adams County, CO
June 2016*



*Brighton PV Solar, Adams County, CO
June 2017*

SUMMARY OF ADJOINING USES

The table below summarizes each Existing Solar Farm's adjoining uses.

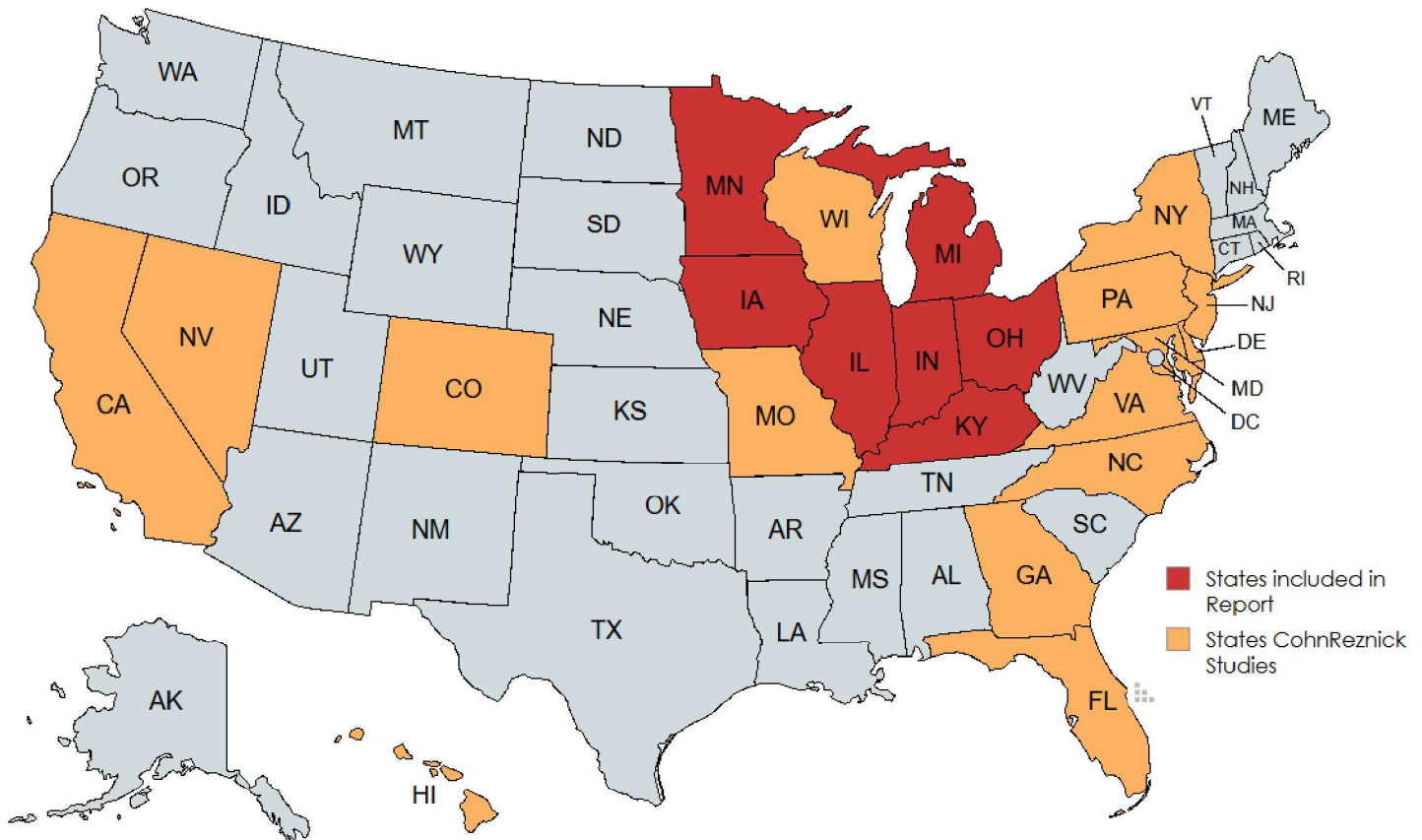
Composition of Surrounding Uses (% of Surrounding Acreage)							
Solar Farm #	Solar Farm	Acreage % of Surrounding Agricultural Uses	Acreage % of Surrounding Residential Uses	Acreage % of Surrounding Industrial Uses	Acreage % of Surrounding Office Uses	Acreage % of Surrounding Other Uses	Avg. Distance from Panels to Improvements (Feet)
1	Dunn's Bridge Solar	56.10%	43.90%	0.00%	0.00%	0.00%	420
2	Assembly Solar	82.50%	8.20%	5.00%	0.00%	4.30%	233
3	DTE Lapeer	60.00%	35.00%	0.00%	0.00%	5.00%	260
4	Riverstart Solar	82.40%	14.80%	0.00%	0.00%	2.80%	588
5	Hillcrest Solar	90.00%	8.50%	0.00%	0.00%	1.50%	765
6	North Star	75.00%	15.00%	0.00%	0.00%	10.00%	325
7	Wapello Solar	81.00%	17.00%	0.00%	0.00%	2.00%	328
8	Turkey Creek Solar	71.20%	22.40%	5.30%	0.70%	0.30%	680
9	Grand Ridge Solar	97.60%	1.40%	0.00%	0.00%	1.00%	553

Overall, the vast majority of the surrounding acreage for each comparable solar farm is made up of agricultural land, some of which have homesteads. There are also smaller single-family home sites that adjoin the solar farms analyzed in this report. Generally, these solar farms are sound comparables to Doral Renewables' proposed solar project in terms of adjoining uses, location, and size.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

SUMMARY AND FINAL CONCLUSIONS

The purpose of this property value impact report is to determine whether the presence of a solar farm has caused a measurable and consistent impact on adjacent property values. Under the identified methodology and scope of work, CohnReznick reviewed published methodology for measuring impact on property values as well as published reports that analyzed the impact of solar farms on property values. These studies found little to no measurable and consistent difference between Test Area Sales and Control Area Sales attributed to the solar farms. CohnReznick has performed solar impact studies in 23 states. A map of all states that CohnReznick has conducted a solar farm impact study, as well as the studies included in this report are presented in the following map.



A summary of the chosen CohnReznick impact studies prepared is presented on the following page.

CohnReznick Solar Analysis Conclusions

Solar Farm No.	Solar Farm	Number of Test Area Sales	Number of Control Area Sales	Median Adjoining Property Sale Price per Unit (Test Area Sales)	Median Control Area Sales Price per Unit	Difference (%)	Avg. Feet from Panel to Lot	Avg. Feet from Panel to House
Single-Family Residential								
1	Dunn's Bridge Solar Group 1	2	8	\$150.56	\$149.72	+0.56%	280	480
	Dunn's Bridge Solar Group 2*	1	7					
	Dunn's Bridge Solar Group 3	1	10	\$140.96	\$143.84	-2.00%	135	240
2	Assembly Solar Group 1	1	6	\$173.96	\$178.06	-2.30%	75	120
	Assembly Solar Group 2a	1	17	\$144.49	\$140.74	+2.67%	155	350
	Assembly Solar Group 2b	1	13	\$168.01	\$163.36	+2.85%	155	350
	Assembly Solar Group 3	1	6	\$176.17	\$151.53	+16.26%	590	780
3	DTE Lapeer Solar Group 1	3	6	\$105.26	\$99.64	+5.64%	205	285
	DTE Lapeer Solar Group 2	1	5	\$114.12	\$113.01	+0.98%	225	315
	DTE Lapeer Solar Group 3	1	4	\$94.84	\$91.80	+3.31%	165	250
4	Riverstart Solar Group 1	1	6	\$101.75	\$99.55	+2.21%	225	700
	Riverstart Solar Group 2	1	8	\$105.32	\$104.08	+1.19%	140	260
5	Hillcrest Solar Group 1	1	11	\$213.03	\$200.96	+6.00%	225	350
	Hillcrest Solar Group 2	1	6	\$95.10	\$98.52	-3.47%	110	265
	Hillcrest Solar Group 3	1	6	\$125.00	\$117.45	+6.43%	105	185
	Hillcrest Solar Group 4	1	11	\$196.41	\$185.40	+5.94%	805	940
6	North Star Solar Group 1	3	11	\$151.93	\$139.50	+8.91%	123	358
	North Star Solar Group 2	1	10	\$119.82	\$118.72	+0.93%	152	225
	North Star Solar Group 3*	1	10					
	North Star Solar Group 4	1	7	\$172.41	\$170.86	+0.91%	90	180
	North Star Solar Group 5	1	8	\$205.09	\$170.88	+20.02%	90	280
	North Star Solar Group 6	1	4	\$114.48	\$120.49	-4.99%	130	730
	North Star Solar Group 7	1	11	\$156.84	\$135.63	+15.64%	200	330
	North Star Solar Group 8	1	5	\$139.70	\$132.68	+5.29%	295	800
	North Star Solar Group 9	1	8	\$101.63	\$103.95	-2.23%	115	285
7	Wapello Solar	1	6	\$131.40	\$131.08	+0.25%	130	180
8	Turkey Creek Solar Group 1	1	8	\$206.19	\$205.58	+0.30%	660	700
9	Grand Ridge Solar	1	5	\$79.90	\$74.35	+7.46%	366	479
Median Variance in Sale Prices for Test Area Sales to Control Area Sales						+2.76%		

33 Adjoining Test Area Sales studied and compared to 223 Control Area Sales

* Note, the paired sale analysis for these groups are outliers as determined earlier in this report and were excluded from this summary table.

Land (Agricultural/Single Family Lots)								
8	Turkey Creek Solar Group 2	2	17	\$40,192	\$30,272	+32.77%	415	-
	Turkey Creek Solar Group 3	1	15	\$23,349	\$22,038	+5.95%	465	-
Median Variance in Sale Prices for Test to Control Areas						+19.36%		

3 Adjoining Test Area Sale studied and compared to 32 Control Area Sales

As summarized above, we evaluated 36 property sales adjoining existing solar facilities (Test Area Sales) and 255 Control Area Sales. In addition, we studied a total of 23 Test Area Sales and 49 Control Area Sales in four Before and After analyses. In total, we have studied over 360 sale transactions.

The solar farms analyzed reflected sales of property adjoining an existing solar farm (Test Area Sales) in which the unit sale prices were effectively the same or higher than the comparable Control Area Sales that were not near a solar farm. The conclusions support that there is no negative impact for improved residential homes adjacent to solar, nor agricultural acreage. This was confirmed with market participants interviews, which provided additional insight as to how the market evaluates farmland and single-family homes with views of the solar farm.

It can be concluded that since the Adjoining Property Sales (Test Area Sales) were not adversely affected by their proximity to the solar farm, that properties surrounding other proposed solar farms operating in compliance with all regulatory standards will similarly not be adversely affected, in either the short or long term periods.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

Based upon the examination, research, and analyses of the existing solar farm uses, the surrounding areas, and an extensive market database, we have concluded that **no consistent negative impact has occurred to adjacent property values that could be attributed to proximity to the adjacent solar farm**, with regard to unit sale prices or other influential market indicators. Additionally, in our workfile we have retained analyses of additional existing solar farms, each with their own set of matched control sales, which had consistent results, indicating no consistent and measurable impact on adjacent property values. This conclusion has been confirmed by numerous county assessors who have also investigated this use's potential impact on property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick Advisory LLC



Andrew R. Lines, MAI, CRE
Principal
Certified General Real Estate Appraiser
Illinois License No. 553.001841
Expires 9/30/2027
New York License No. 46000051059
Expires 6/16/2026
Michigan License No. 1205078298
Expires 7/31/2026



Erin C. Bowen, MAI
Director
Certified General Real Estate Appraiser
Arizona License No. 32052
Expires 12/31/2026
Oregon License No. C001551
Expires 6/30/2026
Iowa License No. CG04209
Expires 6/30/2026

CERTIFICATION

We certify that, to the best of our knowledge and belief:

1. The statements of fact and data reported are true and correct.
2. The reported analyses, findings, and conclusions in this consulting report are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, findings, and conclusions.
3. We have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
4. We have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. We have no bias with respect to the property that is the subject of this report or the parties involved with this assignment.
6. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value finding, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this report.
8. Our analyses, findings, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, which includes the Uniform Standards of Professional Appraisal Practice (USPAP).
9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
10. Andrew R. Lines, MAI, CRE, and Erin C. Bowen, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.
11. We have not relied on unsupported conclusions relating to characteristics such as race, color, religion, national origin, gender, marital status, familial status, age, and receipt of public assistance income, handicap, or an unsupported conclusion that homogeneity of such characteristics is necessary to maximize value.
12. Joseph Ficenec provided significant appraisal consulting assistance to the persons signing this certification, including data verification, research, and administrative work all under the appropriate supervision.
13. We have experience in reviewing properties similar to the subject and are in compliance with the Competency Rule of USPAP.
14. As of the date of this report, Andrew R. Lines, MAI, CRE, and Erin C. Bowen, MAI have completed the continuing education program for Designated Members of the Appraisal Institute.

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick Advisory LLC



Andrew R. Lines, MAI, CRE
Principal
Certified General Real Estate Appraiser
Illinois License No. 553.001841
Expires 9/30/2027
New York License No. 46000051059
Expires 6/16/2026
Michigan License No. 1205078298
Expires 7/31/2026



Erin C. Bowen, MAI
Director
Certified General Real Estate Appraiser
Arizona License No. 32052
Expires 12/31/2026
Oregon License No. C001551
Expires 6/30/2026
Iowa License No. CG04209
Expires 6/30/2026

ASSUMPTIONS AND LIMITING CONDITIONS

The fact witness services will be subject to the following assumptions and limiting conditions:

1. No responsibility is assumed for the legal description provided or for matter pertaining to legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated. The legal description used in this report is assumed to be correct.
2. The property is evaluated free and clear of any or all liens or encumbrances unless otherwise stated.
3. Responsible ownership and competent management are assumed.
4. Information furnished by others is believed to be true, correct and reliable, but no warranty is given for its accuracy.
5. All engineering studies are assumed to be correct. The plot plans and illustrative material in this report are included only to help the reader visualize the property.
6. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for obtaining the engineering studies that may be required to discover them.
7. It is assumed that the property is in full compliance with all applicable federal, state, and local and environmental regulations and laws unless the lack of compliance is stated, described, and considered in the evaluation report.
8. It is assumed that the property conforms to all applicable zoning and use regulations and restrictions unless nonconformity has been identified, described and considered in the evaluation report.
9. It is assumed that all required licenses, certificates of occupancy, consents, and other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.
10. It is assumed that the use of the land and improvements is confined within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in this report.
11. The date of value to which the findings are expressed in this report apply is set forth in the letter of transmittal. The appraisers assume no responsibility for economic or physical factors occurring at some later date which may affect the opinions herein stated.
12. Unless otherwise stated in this report, the existence of hazardous materials, which may or may not be present on the property, was not observed by the appraisers. The appraisers have no knowledge of the existence of such substances on or in the property. The appraisers, however, are not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation, radon gas, lead or lead-based products, toxic waste contaminants, and other potentially hazardous materials may affect the value of the property. The value estimate is predicated on the assumption that there is no such material on or in the property that would cause a loss in value. No

responsibility is assumed for such conditions or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.

13. The forecasts, projections, or operating estimates included in this report were utilized to assist in the evaluation process and are based on reasonable estimates of market conditions, anticipated supply and demand, and the state of the economy. Therefore, the projections are subject to changes in future conditions that cannot be accurately predicted by the appraisers, and which could affect the future income or value projections.
14. Fundamental to the appraisal analysis is the assumption that no change in zoning is either proposed or imminent, unless otherwise stipulated. Should a change in zoning status occur from the property's present classification, the appraisers reserve the right to alter or amend the value accordingly.
15. It is assumed that the property does not contain within its confined any unmarked burial grounds which would prevent or hamper the development process.
16. The Americans with Disabilities Act (ADA) became effective on January 26, 1992. We have not made a specific compliance survey and analysis of the property to determine if it is in conformance with the various detailed requirements of the ADA. It is possible that a compliance survey of the property, together with a detailed analysis of the requirements of the ADA, could reveal that the property is not in compliance with one or more of the requirements of the Act. If so, this fact could have a negative effect on the value of the property. Unless otherwise noted in this report, we have not been provided with a compliance survey of the property. Any information regarding compliance surveys or estimates of costs to conform to the requirements of the ADA are provided for information purposes. No responsibility is assumed for the accuracy or completeness of the compliance survey cited in this report, or for the eventual cost to comply with the requirements of the ADA.
17. Any value estimates provided in this report apply to the entire property, and any proration or division of the total into fractional interests will invalidate the value estimate, unless such proration or division of interests has been set forth in this report.
18. Any proposed improvements are assumed to have been completed unless otherwise stipulated; any construction is assumed to conform with the building plans referenced in this report.
19. Unless otherwise noted in the body of this report, this evaluation assumes that the subject does not fall within the areas where mandatory flood insurance is effective.
20. Unless otherwise noted in the body of this report, we have not completed nor are we contracted to have completed an investigation to identify and/or quantify the presence of non-tidal wetland conditions on the subject property.
21. This report should not be used as a basis to determine the structural adequacy/inadequacy of the property described herein, but for evaluation purposes only.
22. It is assumed that the subject structure meets the applicable building codes for its respective jurisdiction. We assume no responsibility/liability for the inclusion/exclusion of any structural component item which may have an impact on value. It is further assumed that the subject property will meet code requirements as they relate to proper soil compaction, grading, and drainage.

23. The appraisers are not engineers, and any references to physical property characteristics in terms of quality, condition, cost, suitability, soil conditions, flood risk, obsolescence, etc., are strictly related to their economic impact on the property. No liability is assumed for any engineering-related issues.

The evaluation services will be subject to the following limiting conditions:

1. The findings reported herein are only applicable to the properties studied in conjunction with the Purpose of the Evaluation and the Function of the Evaluation as herein set forth; the evaluation is not to be used for any other purposes or functions.
2. Any allocation of the total value estimated in this report between the land and the improvements applies only to the stated program of utilization. The separate values allocated to the land and buildings must not be used in conjunction with any other appraisal and are not valid if so used.
3. No opinion is expressed as to the value of subsurface oil, gas or mineral rights, if any, and we have assumed that the property is not subject to surface entry for the exploration or removal of such materials, unless otherwise noted in the evaluation.
4. This report has been prepared by CohnReznick under the terms and conditions outlined by the enclosed engagement letter. Therefore, the contents of this report and the use of this report are governed by the client confidentiality rules of the Appraisal Institute. Specifically, this report is not for use by a third party and CohnReznick is not responsible or liable, legally or otherwise, to other parties using this report unless agreed to in writing, in advance, by both CohnReznick and/or the client or third party.
5. Disclosure of the contents of this evaluation report is governed by the by-laws and Regulations of the Appraisal Institute has been prepared to conform with the reporting standards of any concerned government agencies.
6. The forecasts, projections, and/or operating estimates contained herein are based on current market conditions, anticipated short-term supply and demand factors, and a continued stable economy. These forecasts are, therefore, subject to changes with future conditions. This evaluation is based on the condition of local and national economies, purchasing power of money, and financing rates prevailing at the effective date of value.
7. This evaluation shall be considered only in its entirety, and no part of this evaluation shall be utilized separately or out of context. Any separation of the signature pages from the balance of the evaluation report invalidates the conclusions established herein.
8. **Possession of this report, or a copy thereof, does not carry with it the right of publication, nor may it be used for any purposes by anyone other than the client without the prior written consent of the appraisers, and in any event, only with property qualification.**
9. The appraisers, by reason of this study, are not required to give further consultation or testimony or to be in attendance in court with reference to the property in question unless arrangements have been previously made.
10. Neither all nor any part of the contents of this report shall be conveyed to any person or entity, other than the appraiser's client, through advertising, solicitation materials, public relations, news, sales or

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

other media, without the written consent and approval of the authors, particularly as to evaluation conclusions, the identity of the appraisers or CohnReznick, LLC, or any reference to the Appraisal Institute, or the MAI designation. Further, the appraisers and CohnReznick, LLC assume no obligation, liability, or accountability to any third party. If this report is placed in the hands of anyone but the client, client shall make such party aware of all the assumptions and limiting conditions of the assignment.

11. This evaluation is not intended to be used, and may not be used, on behalf of or in connection with a real estate syndicate or syndicates. A real estate syndicate means a general or limited partnership, joint venture, unincorporated association or similar organization formed for the purpose of, and engaged in, an investment or gain from an interest in real property, including, but not limited to a sale or exchange, trade or development of such real property, on behalf of others, or which is required to be registered with the United States Securities and Exchange commissions or any state regulatory agency which regulates investments made as a public offering. It is agreed that any user of this evaluation who uses it contrary to the prohibitions in this section indemnifies the appraisers and the appraisers' firm and holds them harmless from all claims, including attorney fees, arising from said use.

ADDENDUM A: APPRAISER QUALIFICATIONS

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Andrew R. Lines, MAI, CRE

Partner – Real Estate Valuation Valuation Advisory Services

1 S. Wacker Drive, Suite 3550
Chicago, IL 60606
312-508-5892 (w)
917-696-9636 (m)
andrew.lines@cohnreznick.com
www.cohnreznick.com

Andrew R. Lines, MAI, CRE is a Partner for CohnReznick Advisory's Valuation Advisory Services practice who has been a CohnReznick employee for fourteen years. Andrew has been involved in the real estate business for 25 years and has performed valuations on all real estate classes (industrial, commercial, residential, development land). Special-use valuations include affordable housing (as well as market studies), student housing, senior housing, cannabis facilities (indoor/outdoor, processing and dispensaries), landfills, waste transfer stations, golf courses, marinas, hospitals, universities, telecommunications facilities, data centers, self-storage facilities, racetracks, and corridors. Impact Study Reports have also been generated for zoning hearings related to the development of solar facilities, wind powered facilities, landfills, big box retail, waste transfer stations, private mental health clinics, cannabis dispensaries, concert/stadium venues and day care centers. He is also experienced in the valuation of leasehold, leased fee, and partial interests, as well as purchase price allocations (GAAP, IFRS and IRC 1060) for financial reporting.

Valuations have been completed nationwide for a variety of assignments including mortgage financing, litigation, tax appeal, estate gifts, asset management, workouts, and restructuring, as well as valuation for financial reporting including purchase price allocations (ASC 805), impairment studies, and appraisals for investment company guidelines and REIS standards. Andrew has qualified as an expert witness, providing testimony for cases in the states of IL, DC, VA, NY and MD, and for zoning hearings in IL, IN, MI, NY, HI, OH, KY, CO, PA, WI and MO. Andrew has also performed appraisal review assignments for accounting purposes (audit support), asset management, litigation and as an evaluator for a large Midwest regional bank.

Andrew has earned the professional designation of Member of the Appraisal Institute (MAI) and is also a Counselor of Real Estate (CRE). He has also qualified for certified general commercial real estate appraiser licenses in AZ, CA, IL, IN, WI, MD, OH, NY, NJ, FL, GA, KY and DC. Temporary licenses have been granted in CT, CO, PA, ID, MS, KS, MT and SC.

Education

- Syracuse University: Bachelor of Fine Arts
- MAI Designation (Member of the Appraisal Institute)

Professional Affiliations

- Counselors of Real Estate (CRE)
- Chicago Chapter of the Appraisal Institute
- International Real Estate Management (IREM)
- National Council of Housing and Market Analysts (NCHMA)

Community Involvement

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.

- Syracuse University Regional Council
- Chicago Friends School

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Erin C. Bowen, MAI

Director Valuation Advisory Services

404-847-7740
erin.bowen@cohnreznick.com
www.cohnreznick.com

Erin Bowen, MAI is a Director with CohnReznick in Valuation Advisory Services, where she leads a team of appraisers across the country performing valuation and consulting services on a wide variety of real estate.

Ms. Bowen specializes in renewable energy, lodging, cannabis, seniors housing, large scale retail and multifamily conversion properties. Lodging work includes all hotel property types and brand segments including limited, full service and resort properties; additionally, Ms. Bowen has appraised numerous hotel to multifamily conversion properties including market rate and affordable housing. Cannabis work includes dispensaries, cultivation facilities including specialized indoor facilities and greenhouse properties, processing and manufacturing facilities. Senior's housing assignments include assisted living, skilled nursing facilities and rehabilitation centers. Retail work spans power centers, lifestyle centers, outlet centers and malls. She has appraised numerous additional properties including multifamily, office, medical office, industrial, churches, and vacant land.

Ms. Bowen has expertise in appraising properties at all stages of development, including existing as is, proposed, under construction, renovations and conversion to alternate use. Valuations have been completed nationwide for a variety of assignments including litigation, eminent domain, tax appeal, mortgage financing, estate gifts, asset management, as well as valuation for financial reporting including purchase price allocations (ASC 805). Ms. Bowen has worked on numerous appraisal assignments for eminent domain use for both condemner and land owner.

Additionally, Ms. Bowen has specialized in Property Value Impact Analysis, measuring the possible detrimental impact of economic and environmental influences on property values for a variety of property types, including cell towers, stadiums, behavioral health centers with an emphasis on renewable energy facilities including solar and wind. She has qualified as an expert witness and testified in front of power siting boards, zoning boards and planning commissions in New Mexico, Ohio, Michigan, Kentucky, Indiana and Illinois.

Education

- University of California, San Diego: Bachelor of Arts in Psychology and Theater; College Honors

Professional Affiliations

- Designated Member of the Appraisal Institute

Licenses

- Active licenses in AZ, CA, NV, IA, NM, TX and OR

Disclaimer: This report is limited to the intended use, intended users (Doral Renewables, LLC) and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Joe Ficenec

Senior Consultant, Valuation Advisory Services

621 Capital Mall
Sacramento, CA 95814
916-930-5237
joe.ficenec@cohnreznick.com
www.cohnreznick.com

Joe Ficenec is a senior consultant in CohnReznick Advisory LLC's Valuation Advisory Services practice and is based in the Sacramento office. Joe specializes in Impact Study Reports, which have been conducted for zoning hearings related to the development of solar facilities and wind powered facilities. Joe has experience in attending public information meetings to address concerns regarding the impact of solar and wind powered facilities on local real estate values. He also has experience in assisting with the appraisal multifamily, office, industrial, retail, lodging and mixed-use properties for financing and purchase price allocation purposes.

Joe graduated with honors from the University of California, Davis in May 2017 with a major in managerial economics. Prior to joining CohnReznick, Joe worked as a Real Estate Assessor for a county government and as a consultant for a nationwide real estate firm in San Francisco.

Education

- University of California, Davis – B.S. Managerial Economics



www.cohnreznick.com

REAL ESTATE ADJACENT PROPERTY VALUE IMPACT REPORT:

**Site Specific Analysis Addendum Report:
For the Proposed 500 MW Mackinaw Solar Project
To Be Located in Tazewell County, Illinois**

Prepared For:

Stanci March
Senior Development Manager
Doral Renewables LLC
2 Logan Square, Suite 1830
Philadelphia, Pennsylvania 19103

Submitted By:

CohnReznick Advisory LLC
Valuation Advisory Services
1 S. Wacker Drive, Suite 3550
Chicago, Illinois 60606
(312) 508-5900

Andrew R. Lines, MAI, CRE
Erin C. Bowen, MAI

August 18, 2026

LETTER OF TRANSMITTAL

August 18, 2026

Stanci March
Senior Development Manager
Doral Renewables, LLC
2 Logan Square, Suite 1830
Philadelphia, Pennsylvania 19103

SUBJECT: Addendum - Property Value Impact Report
Proposed 500 MW Mackinaw Solar Project
Tazewell County, Illinois

Dear Mr. March:

This letter and associated report are considered an Addendum to the previously prepared property value impact report with an effective date of March 17, 2026 (“Primary Report”). All facts and circumstances surrounding the property value impact report that analyze existing solar farms, and any effect on adjacent property values are contained within the cited Primary Report. This Addendum cannot be properly understood without the cited Primary Report and should be reviewed in unison.

Per the client’s request, we have researched the proposed solar farm on land located in Tazewell County, Illinois. The proposed solar use called Mackinaw Solar will have a capacity of up to 500 MW AC (megawatts alternating current).

The purpose of this consulting assignment is to determine whether proximity to a renewable energy use (solar farm) has an impact on adjacent property values. The intended use of our opinions and conclusions is to assist the client in addressing local concerns and to provide information that local bodies are required to consider in their evaluation of solar project use applications. We have not been asked to value any specific property, and we have not done so.

The clients and intended users for the assignment are Mackinaw Solar LLC and Doral Renewables LLC. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick Advisory LLC (“CohnReznick”).

The assignment is intended to conform to the Uniform Standards of Professional Appraisal Practice (USPAP), the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, as well as applicable state appraisal regulations.

Based on the analysis in the accompanying report, and subject to the definitions, assumptions, and limiting conditions expressed in the report, our findings are as follows.

FINDINGS

- I. **Academic Studies:** CohnReznick reviewed and analyzed published academic studies that specifically analyzed the impact of solar facilities on nearby property values. These studies include multiple regression analyses of hundreds and thousands of sales transactions, and opinion surveys, for both residential homes and farmland properties in rural communities, the majority of the data used in various studies indicates that there is no consistent and measurable impact to surrounding property values. We note that some of these studies do show a very small impact to certain homes, in certain locations, at certain distances, but these conclusions are not necessarily indicative of future projects in other locations.

Peer Authored Studies: CohnReznick also reviewed studies prepared by other real estate valuation experts that specifically analyzed the impact of solar facilities on nearby property values. These studies found little to no measurable or consistent difference in value between the Test Area Sales and the Control Area Sales attributed to the proximity to existing solar farms and noted that solar energy uses are generally considered a compatible use.

- II. **CohnReznick Studies:** CohnReznick has performed in 23 states, of both residential and agricultural properties, in which we have determined that the existing solar facilities have not caused any consistent and measurable negative impact on property values.

For this Project, we have included nine of these studies which are most similar to the subject in terms of general location and size, summarized as follows:

CohnReznick - Existing Solar Farms Studied					
Solar Farm #	Solar Farm	County	State	MW AC	Acreage
1	Dunn's Bridge Solar	Jasper & Starke	IN	700.00	5,000
2	Assembly Solar	Shiawassee	MI	239.00	1,900
3	DTE Lapeer	LaPeer	MI	48.28	365.0
4	Riverstart Solar	Randolph	IN	200.00	1,400
5	Hillcrest Solar	Brown	OH	200.00	1,940
6	North Star	Chisago	MN	100.00	1,000
7	Wapello Solar	Louisa	IA	100.00	800
8	Turkey Creek Solar	Garrard	KY	50.00	753
9	Grand Ridge Solar	LaSalle	IL	20.00	158

It is noted that proximity to the solar farms has not deterred sales of nearby agricultural land and residential single-family homes, nor has it deterred the development of new single-family homes on adjacent land.

This report also includes four "Before and After" analyses, in which sales that occurred prior to the announcement and construction of the solar farm project were compared with sales that occurred

after completion of the solar farm project, for both adjoining and non-adjoining properties. No measurable impact on property values was demonstrated.

- III. Market Participant Interviews: Our conclusions also consider interviews with over 75 County and Township Assessors, who have at least one solar farm in their jurisdiction, and in which they have determined that solar farms have not negatively affected adjacent property values.

With regards to the Project, we specifically interviewed the following persons in Illinois:

CohnReznick - Assessor Quotes						
State	County	Assessor	Assessor Quote	Solar Projects in Jurisdiction	Date Solar Project Completed	Contact Date
IL	White	Rachel Hamblin	"We have not observed any trends to indicate an impact to property values due to their proximity to solar facilities. Additionally, we have not received any property assessment appeals due to proximity to the solar farms."	149 MW Big River Solar	Aug-22	Aug-25
				150 MW Boomtown Renewable Energy Center	Dec-24	
IL	LaSalle	Viki Crouch	"There has been no impact on property values due to their proximity to the Grand Ridge Solar Farm."	20 MW Grand Ridge Solar Farm	Jul-12	Aug-20
IL	McLean	Shaun Harner	"There have been no modifications to the assessment process of homes in close proximity to solar facilities and they have not noticed any differences in sale price trends."	0.2 MW Heartland CC Project	Jan-24	Aug-25
				2.0 MW Moraine CSG	Sep-21	
				2.0 MW Breezewood Solar Project	Sep-24	
IL	Will	Iris Shaw	"Will County has not changed the assessment methodology for homes adjacent to existing solar projects and no one has filed for reductions in assessed values due to being near solar facilities."	5.0 MW Towanda Solar Project	Dec-25	Aug-25
				21 Community-Scale Facilities	Dec-17 to Dec-25	
IL	Christian	Chad Coady	"We have seen no trends that indicate solar facilities have an impact on property values due to proximity in Christian County."	1.5 MW GSI Group Solar Farm	Jan-21	Sep-25
				5.0 MW Skyline Solar Project	Nov-24	
				1.1 MW SAE Taylorville Solar Farm	May-25	
IL	Stephenson	Angie Dieterman	"There has been no impact on property values due to their proximity to any of the solar farms."	100 MW High Point Solar	Nov-23	Feb-23
				23 Community-Scale Facilities	Dec-20 to Nov-25	
IL	Fayette	Cindi Lotz	"The Dressor Plains Solar Project has not had an impact on property values or caused an increase in property assessment appeals due to proximity to the solar farm."	99 MW Dressor Plains Solar	Sep-21	Jul-23
				1.8 MW Conagra Foods Solar	Jan-21	
IL	Ogle	Tricia Black	"We have not seen any trends that solar projects are impacting property values or increasing requests for assessment reductions."	6 Community-Scale Facilities	Nov-14 to Nov-25	Sep-25
IL	Coles	Michelle Babbs	"We have not reduced assessed values for homes proximate to the Prairie Wolf Solar Project as there has been no sale transactions to warrant doing so."	200 MW Prairie Wolf Solar	Nov-25	Feb-26

To give us additional insight as to how the market evaluates farmland and single-family homes with views of solar farms, we interviewed numerous real estate brokers and other market participants who were party to actual sales of property adjacent to solar; these professionals also confirmed that solar farms did not diminish property values or marketability in the areas they conducted their business.

- IV. Solar Farm Factors on Harmony of Use: In the course of our research and studies, we have recorded information regarding the compatibility of these existing solar facilities and their adjoining uses, including the continuing development of land adjoining these facilities.

CONCLUSION

Considering all of the preceding, the data indicates that solar facilities do not have a negative impact on adjacent property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Very truly yours,

CohnReznick Advisory LLC



Andrew R. Lines, MAI, CRE
Partner
Certified General Real Estate Appraiser
Illinois License No. 553.001841
Expires 9/30/2027
Michigan License No. 1205078298
Expires 7/31/2026
New York License No. 46000051059
Expires 6/16/2028



Erin C. Bowen, MAI
Director
Certified General Real Estate Appraiser
Arizona License No. 32052
Expires 12/31/2026
Oregon License No. C001551
Expires 6/30/2028
Iowa License No. CG04209
Expires 6/30/2028

TABLE OF CONTENTS

LETTER OF TRANSMITTAL	2
FINDINGS	3
CONCLUSION	5
SCOPE OF WORK	7
CLIENT	7
INTENDED USERS.....	7
INTENDED USE	7
PURPOSE	7
DEFINITION OF VALUE.....	7
EFFECTIVE DATE & DATE OF REPORT	8
PRIOR SERVICES	8
INSPECTION.....	8
IDENTIFICATION AND DESCRIPTION OF THE PROPOSED PROJECT	9
TRAFFIC PATTERNS AND CONNECTIVITY	15
DEMOGRAPHIC FACTORS	15
CONCLUSION	16
ILLINOIS SOIL PRODUCTIVITY AND VALUE TRENDS.....	17
NCCPI PRODUCTIVITY INDEX	17
AREA VALUE TRENDS - CROPLAND	22
AREA VALUE TRENDS – RESIDENTIAL HOMES	23
LOCAL LAND DEVELOPMENT TRENDS.....	26
SUMMARY AND FINAL CONCLUSIONS	28
CERTIFICATION	30
ASSUMPTIONS AND LIMITING CONDITIONS.....	32
ADDENDUM A: APPRAISER QUALIFICATIONS	36

SCOPE OF WORK

CLIENT

The clients for this assignment are Mackinaw Solar LLC and Doral Renewables LLC.

INTENDED USERS

Mackinaw Solar LLC and Doral Renewables LLC; other intended users may include the client's legal and site development professionals.

INTENDED USE

The intended use of our opinions and conclusions is to assist the client in addressing local concerns and to provide information that local bodies are required to consider in their evaluation of solar project use applications. We have not been asked to value any specific property, and we have not done so. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick Advisory LLC ("CohnReznick").

PURPOSE

The purpose of this consulting assignment is to determine whether proximity to the proposed solar facility will result in an impact on adjacent property values.

DEFINITION OF VALUE

This report utilizes Market Value as the appropriate premise of value. Market value is defined as:

"The most probable price which a property should bring in a competitive and open market under all conditions, requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition are the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. Buyer and seller are typically motivated;
2. Both parties are well informed or well advised, and acting in what they consider their own best interests;
3. A reasonable time is allowed for exposure in the open market.
4. Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and
5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale."¹

¹ Code of Federal Regulations, Title 12, Chapter I, Part 34.42[h]

EFFECTIVE DATE & DATE OF REPORT

August 18, 2026 (Paired sale analyses contained within each study in the Primary Report are periodically updated.)

PRIOR SERVICES

USPAP requires appraisers to disclose to the client any services they have provided in connection with the subject property in the prior three years, including valuation, consulting, property management, brokerage, or any other services.

We have not previously evaluated the proposed Project site.

INSPECTION

Andrew R. Lines, MAI, CRE, and Erin C. Bowen, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.

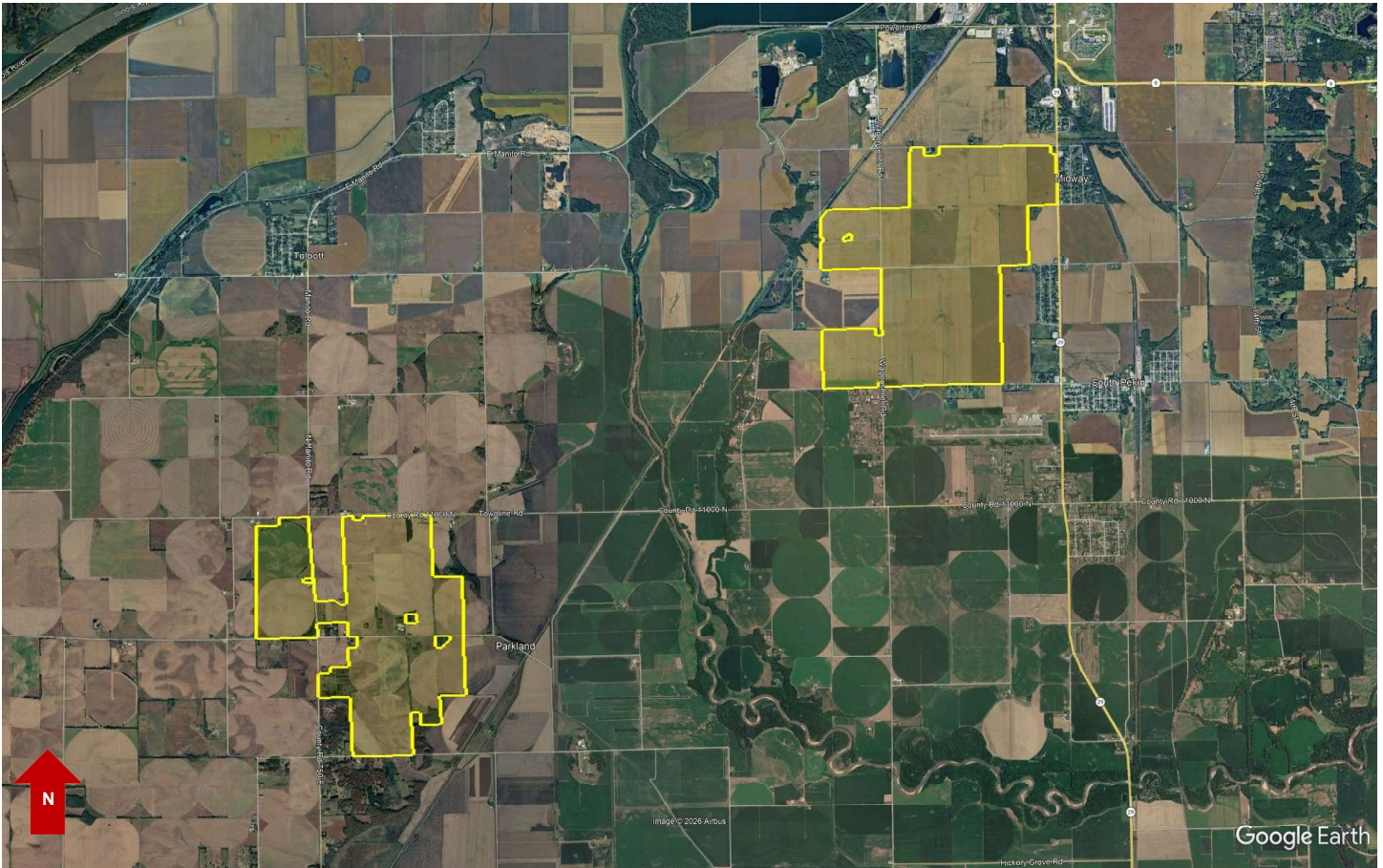
IDENTIFICATION AND DESCRIPTION OF THE PROPOSED PROJECT

The Mackinaw Solar Project (“the Project”) will be located on land bound by East Manito Road to the North, State Route 29 to the East, Warner Road to the South, and Spring Garden Road to the West in Cincinnati and Spring Lake Townships, Tazewell County, Illinois.

Based on development plans for a typical solar farm, the proposed 500MW Mackinaw Solar Project would generally consist of bifacial solar photovoltaic arrays, electrical inverters, underground medium-voltage cables, a 345kV generator tie line, security fencing, a substation and other auxiliary infrastructure. The array areas will be located on agricultural land spread across 33 parcels. The generator tie line will be sited on another 20 agricultural and industrial parcels and connect the Project to the Point of Interconnection at the Powerton Station Substation. The Project will be enclosed by six to seven-foot wildlife fencing with wooden posts. Vegetation and landscape screening will be managed in accordance with the Tazewell County Solar Ordinance. Project setbacks will be a minimum of 150 feet from non-participating residence structures and 50 feet from non-participating property lines and public road rights-of-way in accordance with the Tazewell County Solar Ordinance.

The Mackinaw Solar Project is expected to generate the amount of power equivalent to powering approximately 90,000 homes annually. Construction of Project is estimated to take approximately 18 months, and the Project is expected to operational by December 2029.

The Project will be situated on land parcels utilized for agricultural and industrial purposes, illustrated on the follow page.



Proposed Mackinaw Solar Project parcel areas outlined in yellow above, as provided by Mackinaw Solar LLC

ZONING REGULATIONS

The Project Area parcels are located within the Preservation (A-1) and Conservation Districts as per the zoning map of Tazewell County, Illinois. The purpose of the A-1 District is intended to protect those areas which are best suited to the pursuit of agriculture in order to ensure that agriculture will continue to be maintained as a long term land use and a viable economic activity within the county and the Conservation District is intended for the preservation of natural features, the natural habitats of wildlife, and agricultural lands encouraging the continued use of agricultural production. In Tazewell County, Commercial Solar Energy Facilities are considered a special uses within the A-1 and Conservation Zoning Districts.

Tazewell County has an established ordinance to facilitate the construction, installation, and operation of renewable energy systems in the county, which includes solar energy systems (SES). The following summarizes the development standards for Solar Energy Systems in Tazewell County:

1) Code Compliance

- a. All facilities must be designed in accordance with the International Codes, National Electrical Code enforced by Tazewell County at the time the permit application is accepted, in addition to any to requirement of other State and Federal regulatory agencies.

2) Temporary Site Posting

- a. Before construction begins and while under construction, all sites must have a posting which include but may not be limited to; the approved facility's name, the name of the Engineering, Procurement and Construction (EPC) firm developing the site, contact information for the EPC representative managing site development and the assigned 911 address. The temporary sign shall not be less than fifteen (15) square feet and must be clearly visible from the public roadway.

3) Lighting

- a. All outdoor lighting shall be designed and installed compliant with section §157.056 of the Tazewell County Zoning Code for Outdoor Lighting and any other required regulatory authority in an effort to minimize the visual impact of the structures.

4) Parcel Identification Number

- a. The Facility shall be separated from a larger tract and a new site specific parcel identification number assigned. The Facility Owner shall, at his or her own expense, utilize an Illinois registered land surveyor to prepare a metes and bounds survey description of the land upon which the facility is installed, including access routes, over which the Facility Owner has exclusive control and must deliver a copy of the survey to the Chief County Assessment Officer (CCAO) and to the owner of the land upon which the Facility is constructed. The new tract will not be considered to have new parcel boundary lines for setback purposes. The separate parcel number is issued so that the tax bill can be sent to the facility owner when the system is situated on leased ground.

5) Roads

- a. When proposing to use any county, municipal or township road(s), for the purpose of transporting of components of the Facility or those accessory to the Facility, shall enter into a Road Use Agreement (RUA), approved by the Authority Having Jurisdiction (AHJ), agreements with the County will require approval of the County Board prior to obtaining a permit for construction. Any

road work required must be specifically and uniquely attributable to the construction of the facility. A copy of the approved RUA shall be submitted to Community Development along with Exhibit A – Affidavit of Acknowledgement/Road Use Agreement.

6) Noise Levels

- a. Noise levels shall be regulated by the Illinois Pollution Control Board under 35 Ill. Adm. Code Parts 900, 901, and 910. The facility owner shall, prior to the first anniversary of commercial operation, provide an octave band sound pressure level measurement(s) conducted by a third party acoustic consultant or engineer, from a reasonable number of sampled locations at the perimeter of the facility to demonstrate compliance with this Section.

7) Farmland Drainage Plan and Tile Repair

- a. A final drainage plan shall be created independently by the Facility Owner and shall include the location of any potentially impacted drainage district facilities to the extent the information is publicly available from the county or the drainage district and plans to repair any subsurface drainage procedures outlined in the decommissioning plan. The plan shall be filed with the County and any impacted drainage district prior to obtaining a permit for construction.
- b. Notwithstanding any other provision of law, a Facility Owner with approval to construct a wind or solar energy facility is authorized to cross or impact a drainage system, including, but not limited to, drainage tiles, open drainage districts, culverts, and water gathering vaults, owned or under the control of a drainage district under the Illinois Drainage Code without obtaining prior agreement or approval from the drainage district, except that the Facility Owner shall repair or pay for the repair of any damage to the drainage system, in a manner that assures the tile line's proper operation at the point of repair, caused by the Facility Owner within a reasonable time following completion of such activity.

8) Waste

- a. All solid waste, whether generated from supplies, equipment parts, packaging, from construction, operation or maintenance of the facility, including old parts and equipment, shall be removed from the site immediately and disposed of in an appropriate manner. All hazardous waste generated by the operation and maintenance of the facility including, but not limited to, lubricating materials, shall be removed from the site immediately and disposed of in a manner consistent with all local, state, and federal rules and regulations.

9) Setbacks

- a. Occupied Community Buildings and Nonparticipating Dwellings - 150 feet from the nearest point on the outside wall of the structure;
- b. Public Road Rights-of-Way – 50 feet from the nearest edge.
- c. Boundary lines of Nonparticipating Property – 50 feet to the nearest point on the property line of the nonparticipating property.
- d. The measurement listed is from the nearest edge of any above-ground component of the Facility, excluding fencing.

10) Height

- a. A commercial solar energy facility to be sited so that no component of a solar panel has a height of more than 20 feet above ground when the solar energy facility's arrays are at full tilt.

11) Fence

- a. The Facility's perimeter is enclosed by fencing having a height of at least 6 feet and no more than 25 feet.

12) Screening

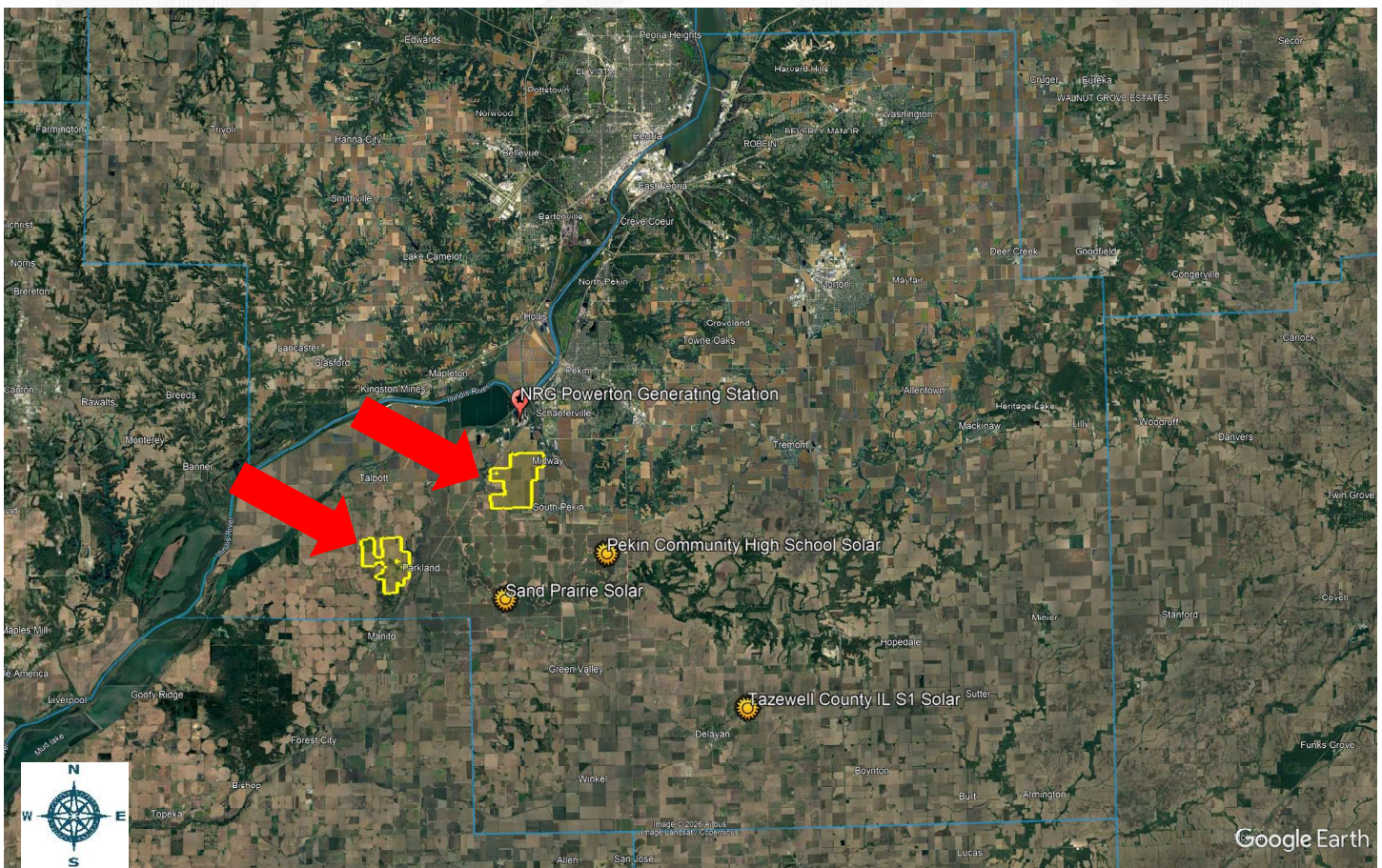
- a. Vegetative screening between the SES Facility and nonparticipating residences may be required as a condition of the Special Use, taking into account (1) the size and location of the Facility, (2) the Facility's visibility from nonparticipating residences, (3) compatibility of native plant species, (4) Screening must be at least four to five feet at planting, (5) recommended to be differing species to prevent potential diseases between like species (4) cost and feasibility of installation and maintenance, and (5) industry standards and best practices from SES Facilities. Any screening requirement must be commercially reasonable, and any vegetation required must be limited in height at full maturity so as to avoid interfering with the energy output of the facility.

13) Vegetation Maintenance Plan (VMP)

- a. The owner shall provide a VMP that is consistent with the goals and objectives of the Pollinator-Friendly Solar Site Act and the AIMA. The ground cover should be selected specific to the site soils of each location to lessen stormwater runoff, erosion and improve topsoil. The plan should also include the method of regular maintenance of the site including the interior of the Facility and the perimeter surrounding the Facility fence.

OVERVIEW OF THE SURROUNDING AREA OF THE PROJECT

The Project consists of a utility-scale, solar energy use in Tazewell County, Illinois known as the 500 MW Mackinaw Solar Project. As of March 2026, per the U.S. Energy Information Administration, there are three existing community-scale solar facilities within the county. The three community-scale solar facilities have all become operational in the past two years and range in generating capacity between 1.4 MW and 2.0 MW. The most recently completed solar facility in the county is the 2.0 MW Tazewell County IL S1 Solar Project, which was developed by SolAmerica Energy, and became operational in October 2025. The first solar facility completed in the county is the 2.0 MW Sand Prairie Solar Project which became operational in May 2024. Additionally, to the north of the Project area is the site of the NRG Powerton Generating Station, a coal-fired power plant consisting of two generating units with a combined capacity of 1,785 MW. A surrounding area map indicating the location of the existing solar projects (yellow suns), the NRG Powerton Generating Station site (red pin) and the proposed Mackinaw Solar Project (red arrow), within Tazewell County (blue lines) are presented below.



Aerial imagery of site area provided by Google Earth, dated May 2026

TRAFFIC PATTERNS AND CONNECTIVITY

The Mackinaw Solar Project will be located on land bound by East Manito Road to the North, State Route 29 to the East, Warner Road to the South, and Spring Garden Road to the West in Cincinnati and Spring Lake Townships, Tazewell County, Illinois.

Major arterials in the Project's surrounding area include County Road 1100 N., which bisects the Project area, and provides east-west access throughout western Tazewell County. Other east-west roads in the surrounding area include Powerton Road, which runs to the north of the Project site, and State Route 9, which runs to the northeast of the Project site. Local north-south roads in the surrounding area include Manito Road, which bisects the western portion of the Project area, and Wagonseller Road, which bisects the eastern portion of the Project area. Additional north-south roads in the surrounding area include State Route 29, which runs along the eastern boundary of the Project site and County Road 1700 E., which runs to the east of the Project area. The nearest highway, U.S. Highway 24, which is accessible approximately four miles north of the Project site, provides north-south access along the Illinois River to the west of the Project area and connects the local area to the City of Peoria to the northeast.

The nearest cities to the Project are Peoria, approximately 12 miles to the northeast, Bloomington, approximately 35 miles to the east, and Springfield, approximately 45 miles to the south.

DEMOGRAPHIC FACTORS

Demographic data is presented below, as compiled by ESRI, which indicates a declining population in the area surrounding the Project, the County, and the State, as well as a predominantly owner-occupied area. Median household income is similar to county levels but is lower than the state of Illinois overall. The household levels in the surrounding area have slightly decreased over the past 16 years, and are forecasted to continue decreasing, albeit at a slower rate, over the next five years. These features indicate a declining economic base.

DEMOGRAPHIC PROFILE			
	5 Mile Radius	Tazewell County	Illinois
Population			
2031 Projection	4,979	125,293	12,370,551
2026 Estimate	5,102	127,414	12,512,962
2010 Census	6,027	135,394	12,830,632
Growth 2026 - 2031	-2.41%	-1.66%	-1.14%
Growth 2010 - 2026	-15.35%	-5.89%	-2.48%
Total Land Area	79 sq. mi.	649 sq. mi.	55,587 sq. mi.
Population Density	65/sq. mi	196/sq. mi	225/sq. mi
Households			
2031 Projection	1,566	54,704	5,143,372
2026 Estimate	1,575	54,467	5,101,116
2010 Census	1,642	54,146	4,836,972
Growth 2026 - 2031	-0.57%	0.44%	0.83%
Growth 2010 - 2026	-4.08%	0.59%	5.46%
2026 Owner Occupied (%)	76.12%	70.95%	60.74%
2026 Renter Occupied (%)	23.88%	29.05%	39.26%
2026 Med. Household Income	\$79,913	\$80,898	\$88,180
2026 Avg. Household Income	\$95,067	\$104,568	\$124,150

CONCLUSION

Land uses in the area surrounding the Project can be categorized as predominantly farmland, the NRG Powerton Generating Station, and residential homesteads. Population growth in the Project Area has been decreasing over the past 16 years, and is projected to continue decreasing over the next five years. The factors presented previously indicate that the proposed Project would not be incompatible with surrounding uses and would not negatively impact surrounding properties.

ILLINOIS SOIL PRODUCTIVITY AND VALUE TRENDS

NCCPI PRODUCTIVITY INDEX

Crop yields have been the basis for establishing a soil productivity index, and are used by county assessors, farmers, and market participants in assessing agricultural land. While crop yields are an integral part in assessing soil qualities, it is not an appropriate metric to rely on because “yields fluctuate from year to year, and absolute yields mean little when comparing different crops. Productivity indices provide a single scale on which soils may be rated according to their suitability for several major crops under specified levels of management, such as an optimum level.”² The productivity index, therefore, not crop yields, is best suited for applications in land appraisal and land-use planning.

The United States Department of Agriculture’s (USDA) National Resources Conservation Services (NRCS) developed and utilizes the National Commodity Crop Productivity Index (NCCPI) as a national soil interpreter and is used in the National Soil Information System (NASIS), but it is not intended to replace other crop production models developed by individual states.³ The focus of the model is on identifying the best soils for the growth of commodity crops, as the best soils for the growth of these crops are generally the best soils for the growth of other crops.⁴ The NCCPI model describes relative productivity ranking over a period of years and not for a single year where external influences such as extreme weather or change in management practices may have affected production. At the moment the index only describes non-irrigated crops, and will later be expanded to include irrigated crops, rangeland, and forestland productivity.⁵

Yields are influenced by a variety of different factors including environmental traits and management inputs. Tracked climate and soil qualities have been proven by researchers to directly explain fluctuations in crop yields, especially those qualities that relate to moisture-holding capacity. Except for these factors, “inherent soil quality or inherent soil productivity varies little over time or from place to place for a specific soil (map unit component) identified by the National Cooperative Soil Survey (NCSS).”⁶ The NRCS Web Soil Survey website has additional information on how the ratings are determined.

The proposed solar farm will be located in Tazewell County, in the west-central portion of Illinois. An excerpt of soil productivity maps are presented below as retrieved from the USDA Web Soil Survey, which provides an illustration of the variation in soil productivity across the local area that is based on the NCCPI. The approximate site areas for the Project is within the boundaries delineated in the following maps. Note, that numerical labels correspond to soil type, not productivity index.

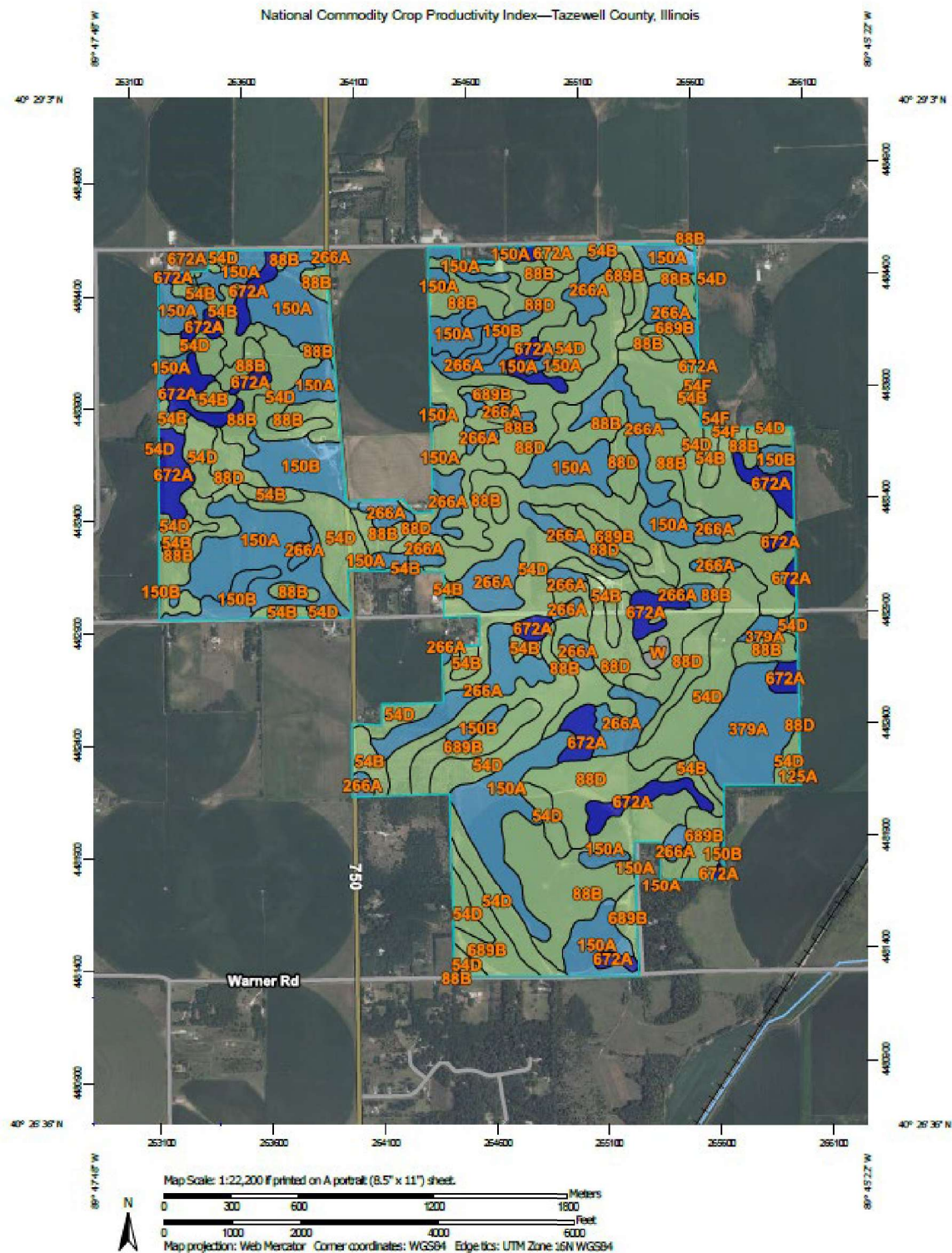
² Bulletin 811: Optimum Crop Productivity of Illinois Soils. University of Illinois, College of Agricultural, Consumer and Environmental Sciences, Office of Research. August 200.

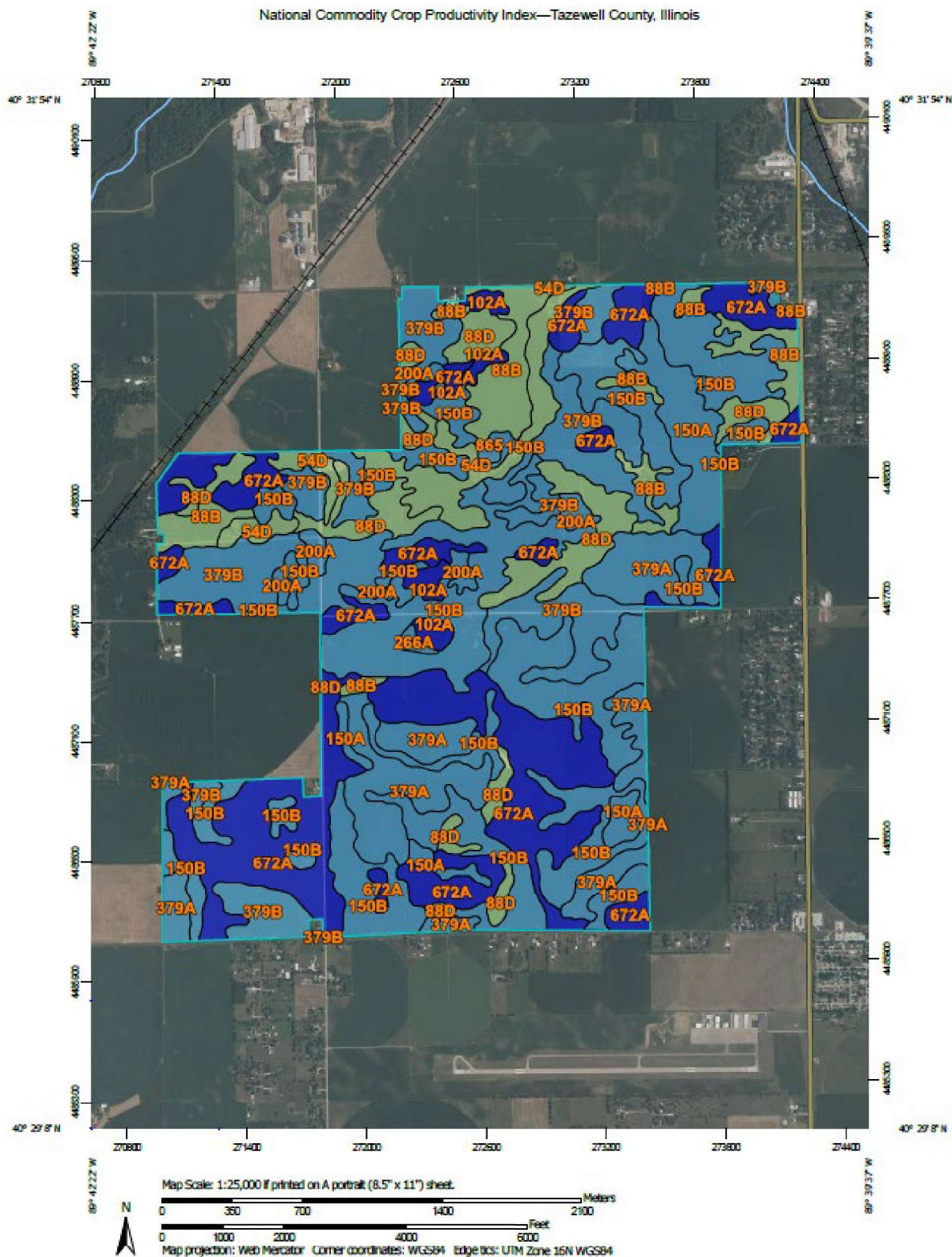
³ Agricultural land rental payments are typically tied to crop production of the leased agricultural land and is one of the primary reasons the NCCPI was developed, especially since the model needed to be consistent across political boundaries.

⁴ Per the User Guide for the National Commodity Crop Productivity Index, the NCCPI uses natural relationships of soil, landscape and climate factors to model the response of commodity crops in soil map units. The present use of the land is not considered in the ratings.

⁵ AgriData Inc. Docs: [http://support.agridatainc.com/NationalCommodityCropProductivityIndex\(NCCPI\).ashx](http://support.agridatainc.com/NationalCommodityCropProductivityIndex(NCCPI).ashx)

⁶ USDA NRCS’s User Guide National Commodity Crop Productivity Index (NCCPI)





MAP LEGEND

MAP INFORMATION

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

	Low inherent productivity
	Moderately low inherent productivity
	Moderate inherent productivity
	Moderately high inherent productivity
	High inherent productivity
	Not rated or not available

Soil Rating Lines

	Low inherent productivity
	Moderately low inherent productivity
	Moderate inherent productivity
	Moderately high inherent productivity
	High inherent productivity
	Not rated or not available

Soil Rating Points

	Low inherent productivity
---	---------------------------

	Moderately low inherent productivity
	Moderate inherent productivity
	Moderately high inherent productivity
	High inherent productivity
	Not rated or not available

Water Features

	Streams and Canals
---	--------------------

Transportation

	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads

Background

	Aerial Photography
---	--------------------

The soil surveys that comprise your AOI were mapped at 1:15,800.

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: Tazewell County, Illinois
Survey Area Data: Version 19, Aug 31, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 30, 2023—Sep 2, 2023

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.

Per the NCCPI, soil productivity is measured on both a numerical scale from 0 to 100, with 0 being the worst and 100 being the best,⁷ and by qualitative ratings. The qualitative rating classifications below are determined by the USDA NRCS and provide general comments on the productivity of the soil.

High inherent productivity indicates that the soil, site, and climate have features that are very favorable for crop production. High yields and low risk of crop failure can be expected if a high level of management is employed.

Moderately high inherent productivity indicates that the soil has features that are generally quite favorable for crop production. Good yields and moderately low risk of crop failure can be expected.

Moderate inherent productivity indicates that the soil has features that are generally favorable for crop production. Good yields and moderate risk of crop failure can be expected.

Moderately low inherent productivity indicates that the soil has features that are generally not favorable for crop production. Low yields and moderately high risk of crop failure can be expected.

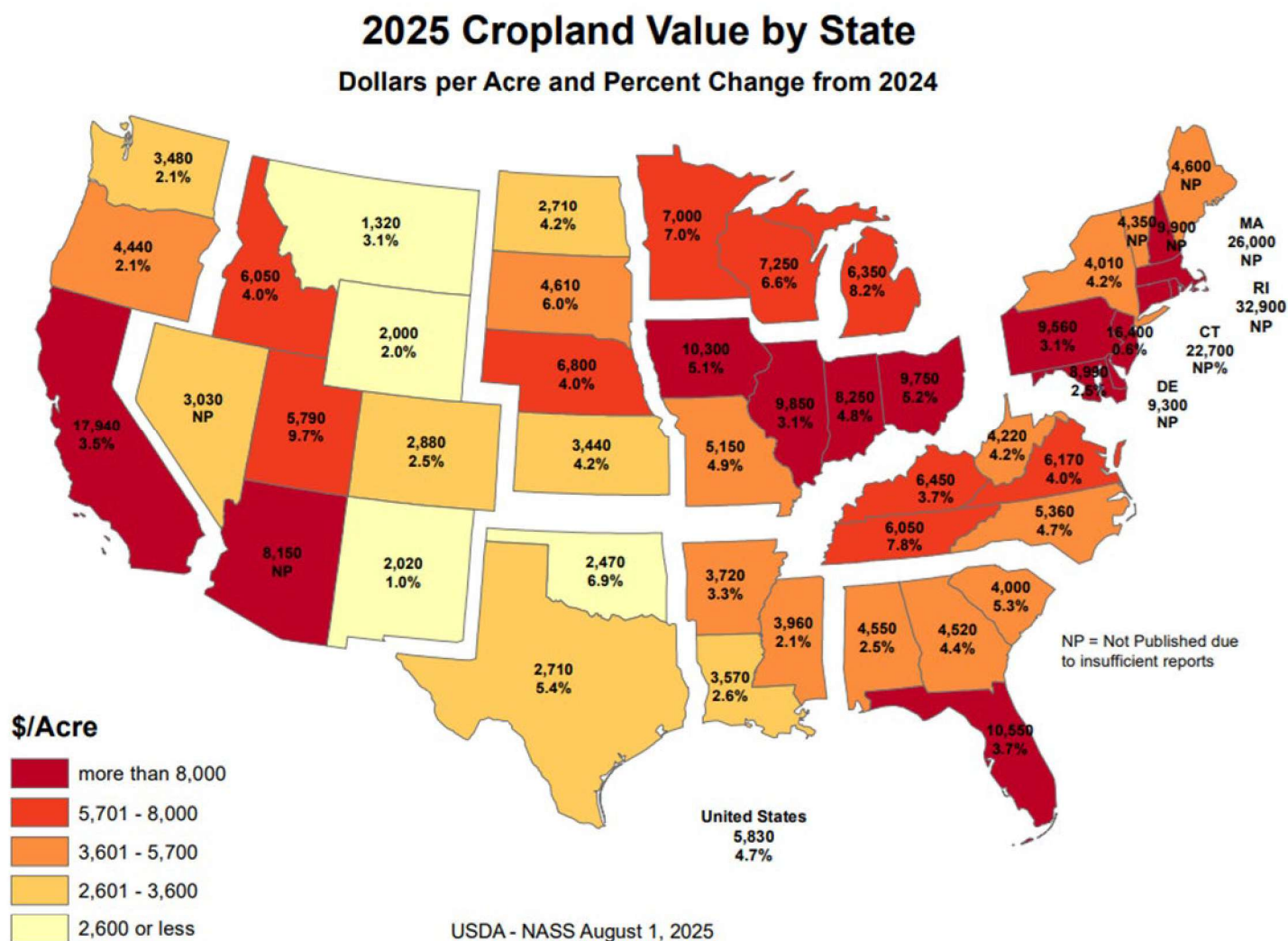
Low inherent productivity indicates that the soil has one or more features that are unfavorable for crop production. Low yields and high risk of crop failure can be expected.

The weighted average soil productivity for the general area was determined to be approximately 68.74. A numerical scale that corresponds to the indicated qualitative ratings above was not available for the NCCPI; however, the soil productivity for this area is in the middle of the range, aligning with the “moderately high inherent productivity” category. According to the qualitative scale above, land with the moderately high inherent productivity classification is favorable for crop production.

⁷ Quantitative ratings are also show in ranges of 0.00 to 1.00. AgriData Inc. presents the NCCPI index rating multiplied by 100 in a range of 0.00 to 100.00 to show up to four significant figures.

AREA VALUE TRENDS - CROPLAND

Agricultural land values are heavily influenced by relative crop production yields. The following exhibit compiled by the USDA National Agricultural Statistics Service (NASS) provides an illustration of how regional conditions such as weather conditions, geographies, and soil conditions can affect crop land real estate values.



Per the NASS report, the average value of cropland in Illinois for 2025 is \$9,850 per acre, which is an increase of 3.1 percent from 2024. In addition, the report indicated that the average annual growth rate for farmland values in Illinois from 2021 to 2025 was 6.1 percent.⁸

⁸ <https://downloads.usda.library.cornell.edu/usda-esmis/files/pn89d6567/2n49w148w/m039n441h/land0825.pdf>

AREA VALUE TRENDS – RESIDENTIAL HOMES

The Project is in Tazewell County, in the west-central portion of Illinois. There are a mix of single-family home types in this area, manufactured homes, and homes with one- and two- stories. Based on our research, homes in the area that have recently been sold were constructed as early as the late-19th century and as recently as 2002.

From mid-May 2025 through mid-May 2026, we identified 25 market transactions of single-family homes that surround the Project area. The sale price per square foot ranges from \$59 per square foot of living area to \$286 per square foot of living area. The home sales were on the market for between 27 days and 484 days, with a median marketing period of 42 days. We studied homes that are more similar to the single-family residences and rural homesteads that surround the majority of the proposed Project Area. The sales are summarized in the table below.

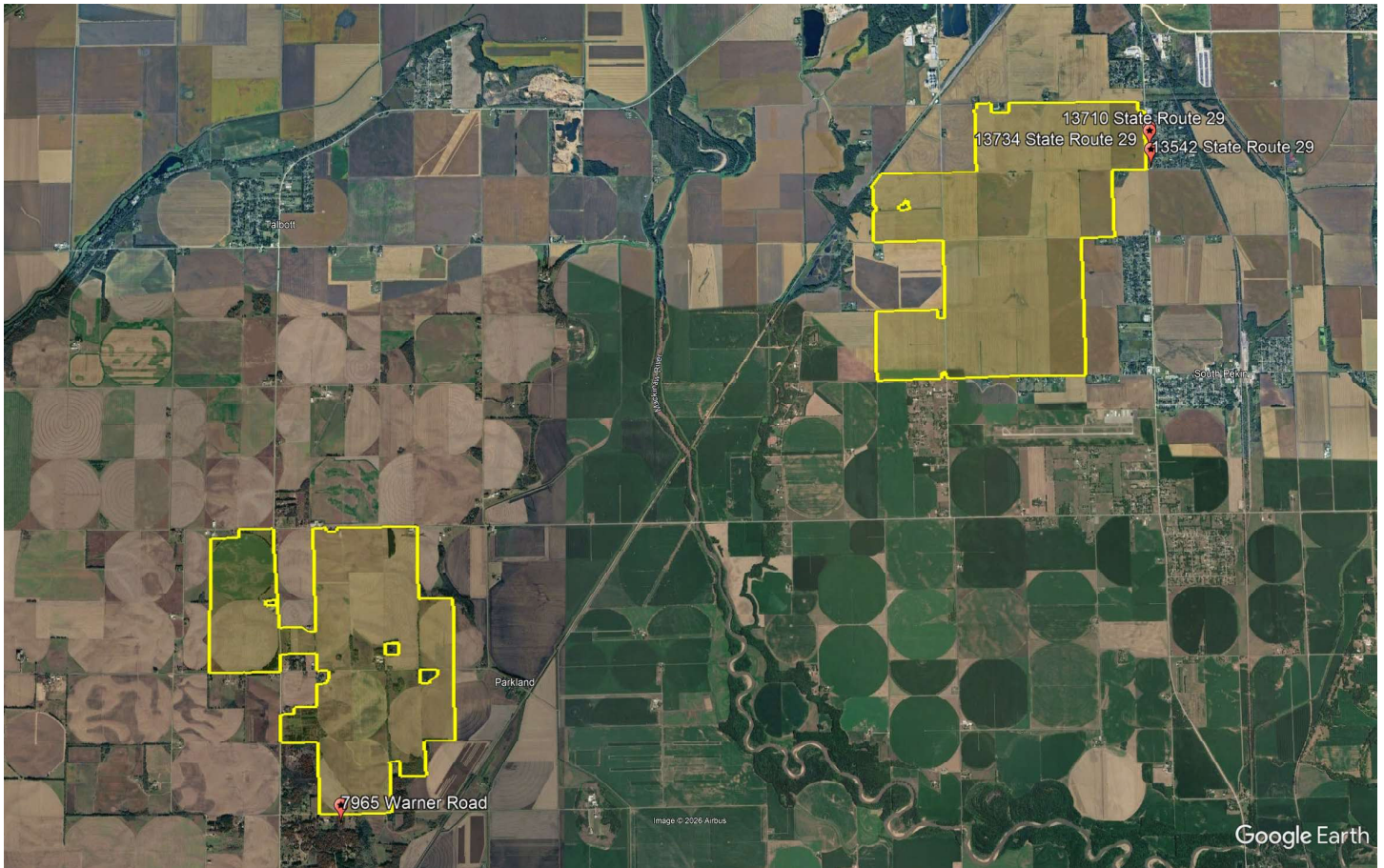
**Home Sales Surrounding Proposed Project Area
(Mid-May 2025 through Mid-May 2026)**

Single Family Homes	Median Lot Size (Acres)	Median Living Area (SF)	Min. Sale Price	Max. Sale Price	Median Sale Price	Median Sale Price PSF
Surrounding Project Area	0.68	1,308	\$62,900	\$280,000	\$143,000	\$97.75

We surveyed the surrounding area of the proposed site to identify any transactions of homes adjacent to the site that occurred within the past year. We identified four single-family residence sales that sold adjacent to the project's proposed location with a median sale price \$108.27 per square foot of gross living area, above the median price per square foot of home sales in the surrounding area. The homes were on the market for between 34 days and 111 days, with an average marketing period of 73 days, within the range of marketing periods for home sales in the surrounding area.

**Home Sales Adjacent to Proposed Project Area
(Mid-May 2025 through Mid-May 2026)**

Address	Building Size (SF)	Sale Date	DOM	List Price	Sale Price	\$ PSF	Lot Size (AC)	Year Built
13734 State Route 29, Pekin, IL	816	1/13/2026	111	\$105,000	\$89,500	\$109.68	0.36	1975
7965 Warner Rd, Manito, IL	1,917	10/31/2025	N/A	N/A	\$270,000	\$140.85	7.00	1974
13710 State Route 29, Pekin, IL	1,729	10/8/2025	34	\$140,000	\$132,500	\$76.63	1.06	1951
13542 State Route 29, Pekin, IL	1,544	6/11/2025	N/A	N/A	\$165,000	\$106.87	1.49	1941



Aerial imagery provided by Google Earth, dated September 2024

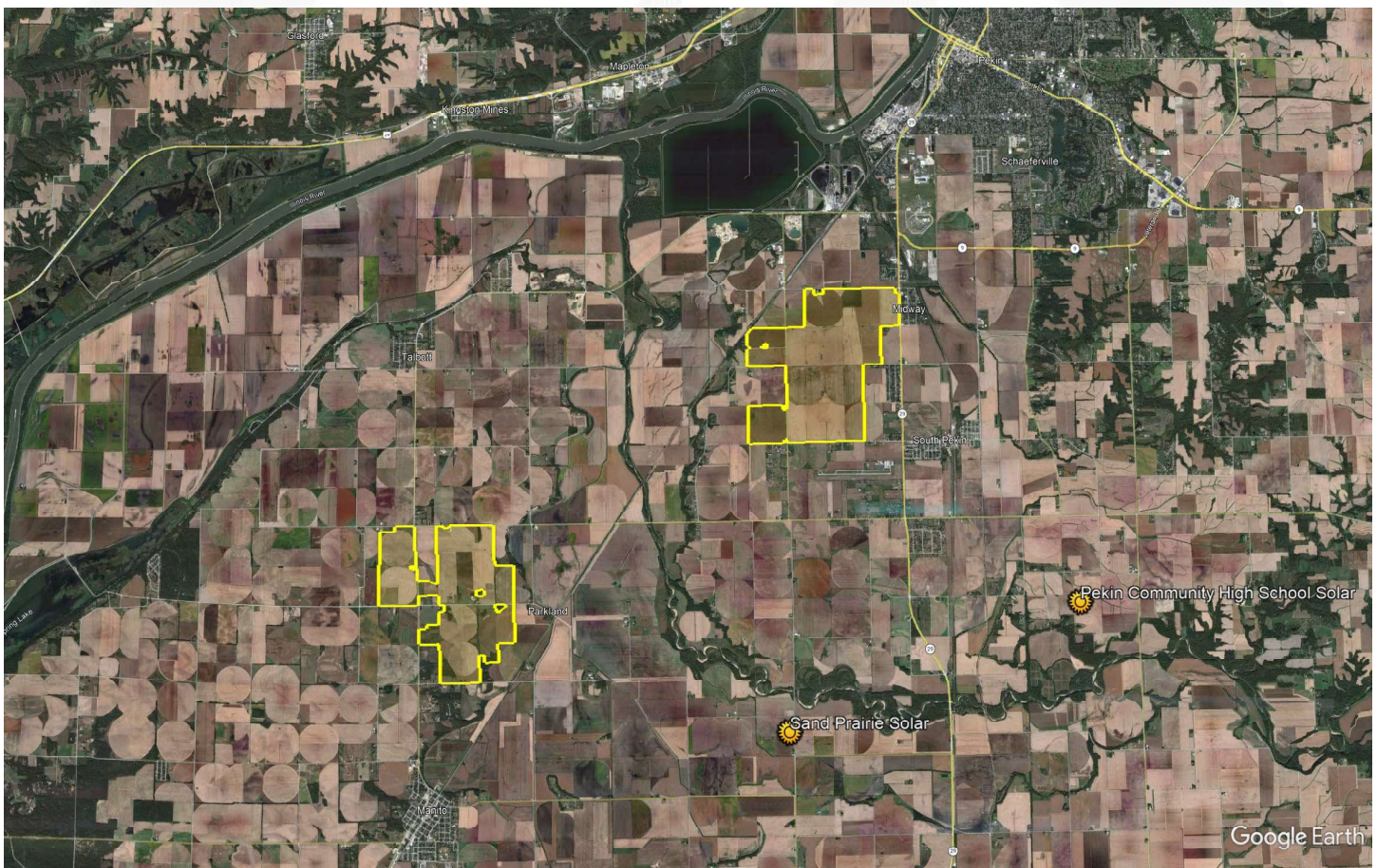
The table below illustrates residential home value trends for the proposed Project's Tazewell County location. The source is the Federal Housing Finance Agency's (FHFA) House Price Index (HPI), which is a weighted, repeat-sales index measuring changes in single-family house prices.

FHFA House Price Index Tazewell County, Illinois		
Year	Annual Change (%)	HPI
2005	-	288.42
2006	4.14	300.36
2007	2.73	308.56
2008	0.54	310.23
2009	-0.95	307.29
2010	-0.67	305.25
2011	-1.91	299.42
2012	-0.01	299.39
2013	0.72	301.54
2014	2.08	307.82
2015	0.82	310.35
2016	0.27	311.19
2017	-0.46	309.76
2018	-0.63	307.82
2019	0.71	310.00
2020	2.43	317.52
2021	5.69	335.58
2022	9.89	368.78
2023	7.72	397.26
2024	5.97	420.99
2025	6.74	449.38
Annual Average Compounded % Change	2.24%	

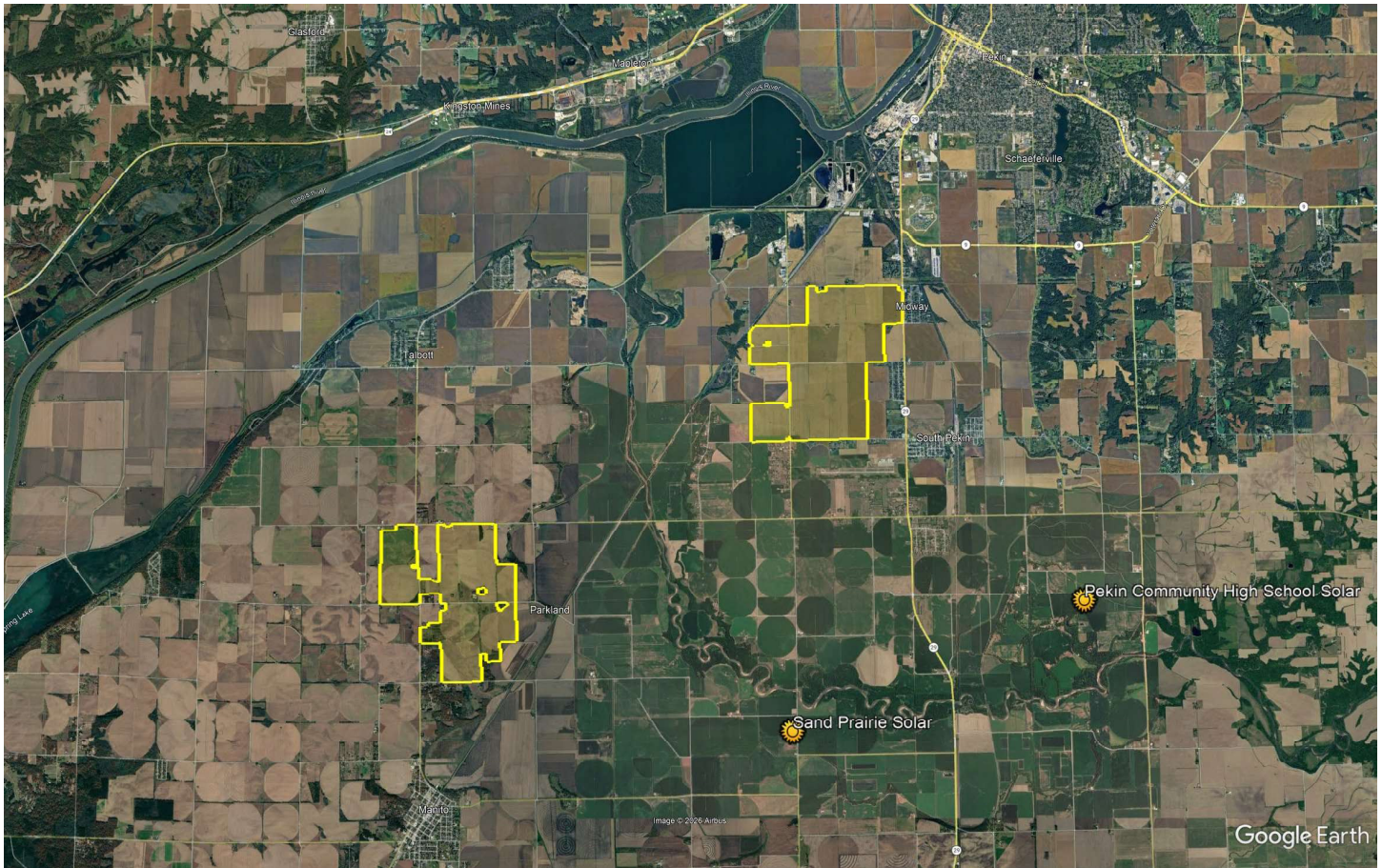
Based on the data shown above, the trend in residential home values in Tazewell County have steadily increased at an average annual rate of 2.24 percent, over the past twenty years. The housing values in the county have grown at a strong rate over the past five years; however, recent macroeconomic conditions have resulted in a market correction based on increases in federal lending rates and general inflation, with a slowing of housing values approaching historical trends.

LOCAL LAND DEVELOPMENT TRENDS

Land values can be driven by a site's proximity to the path of development. The closer a property is to the path of development, and without natural barriers to development, the more value a property may have in the future; however, the little development in the local area has been towards the City of Pekin, approximately three miles to the northeast of the Project area. However, we note that two community-scale solar facilities have been constructed within ten miles of the Project area over the past two years. The 2.0 MW Sand Prairie Solar Project, located approximately three and a half miles south of the Project area, was completed in May 2026, and the 1.4 MW Pekin Community High School Solar Project, located approximately three and a half miles southeast of the Project area, was completed in June 2025. The Project area has been primarily agricultural land for over 15 years.



Aerial Imagery dated October 2010



Aerial Imagery dated September 2025

According to the images above, there has not been much development in the local area over the past 15 years. Generally, any undeveloped agricultural land is considered to be an interim use as the intensity of uses grows in step with macroeconomic factors.

SUMMARY AND FINAL CONCLUSIONS

The Project is located in a stable area that is predominantly agricultural in nature with some residential homesteads. The population quotient (persons per square mile) for the surrounding area is 65, which reflects a rural environment. Local development has not been much developed over the past fifteen years, and the surrounding land parcels are not expected to change from agricultural and industrial uses. Local land and residential home prices have shown steady growth over the past five years and are anticipated to align in the future with macroeconomic changes. Overall, the proposed Project is considered a locally compatible use.

Based on our analysis of real estate taxes in the Primary Report, solar farm uses incur anywhere from 131% to $\pm 1,000\%$ increase in real estate tax revenue for the local area, feeding back into essential services and schools. Local land and residential home prices have remained stable over the past five years and are anticipated to align in the future with macroeconomic changes. Overall, the proposed Project is considered a locally compatible use.

The purpose of the Primary Report and this addendum is to determine whether the presence of a solar farm has caused a measurable and consistent impact on adjacent property values. Under the identified methodology and scope of work, CohnReznick reviewed published methodology for measuring impact on property values as well as published reports that analyzed the impact of solar farms on property values. These studies found little to no measurable and consistent difference between Test Area Sales and Control Area Sales attributed to the solar farms.

The chosen existing solar farms analyzed in the Primary Report reflected sales of property adjoining an existing solar farm (Test Area Sales) in which the unit sale prices were effectively the same or higher than the comparable Control Area Sales that were not near a solar farm. The conclusions support that there is no negative impact for improved residential homes adjacent to solar, nor agricultural acreage. This was confirmed with market participants interviews, which provided additional insight as to how the market evaluates farmland and single-family homes with views of the solar farm.

It can be concluded that since the Adjoining Property Sales (Test Area Sales) were not adversely affected by their proximity to the solar farm, that properties surrounding other proposed solar farms operating in compliance with all regulatory standards will similarly not be adversely affected, in either the short or long term periods.

Based upon the examination, research, and analyses of the existing solar farm uses, the surrounding areas, and an extensive market database, we have concluded that **no consistent negative impact has occurred to adjacent property values that could be attributed to proximity to the adjacent solar farm**, with regard to unit sale prices or other influential market indicators. Additionally, in our workfile we have retained analyses of additional existing solar farms, each with their own set of matched control sales, which had consistent results, indicating no consistent and measurable impact on adjacent property values. This conclusion has been confirmed by numerous county assessors who have also investigated this use's potential impact on property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick Advisory LLC



Andrew R. Lines, MAI, CRE
Partner
Certified General Real Estate Appraiser
Illinois License No. 553.001841
Expires 9/30/2027
Michigan License No. 1205078298
Expires 7/31/2026
New York License No. 46000051059
Expires 6/16/2028



Erin C. Bowen, MAI
Director
Certified General Real Estate Appraiser
Arizona License No. 32052
Expires 12/31/2026
Oregon License No. C001551
Expires 6/30/2028
Iowa License No. CG04209
Expires 6/30/2028

CERTIFICATION

We certify that, to the best of our knowledge and belief:

1. The statements of fact and data reported are true and correct.
2. The reported analyses, findings, and conclusions in this consulting report are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, findings, and conclusions.
3. We have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
4. We have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. We have no bias with respect to the property that is the subject of this report or the parties involved with this assignment.
6. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. Our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value finding, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this report.
8. Our analyses, findings, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, which includes the Uniform Standards of Professional Appraisal Practice (USPAP).
9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
10. Andrew R. Lines, MAI, CRE and Erin C. Bowen, MAI have viewed the exterior of the Project and of all comparable data referenced in this report in person, via photographs, or aerial imagery.
11. We have not relied on unsupported conclusions relating to characteristics such as race, color, religion, national origin, gender, marital status, familial status, age, and receipt of public assistance income, handicap, or an unsupported conclusion that homogeneity of such characteristics is necessary to maximize value.
12. Joseph Ficenec provided consulting assistance to the persons signing this certification, including data verification, research, and administrative work all under the appropriate supervision.
13. We have experience in reviewing properties similar to the subject and are in compliance with the Competency Rule of USPAP.
14. As of the date of this report, Andrew R. Lines, MAI, CRE and Erin C. Bowen, MAI have completed the continuing education program for Designated Members of the Appraisal Institute.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick Advisory LLC



Andrew R. Lines, MAI, CRE
Partner
Certified General Real Estate Appraiser
Illinois License No. 553.001841
Expires 9/30/2027
Michigan License No. 1205078298
Expires 7/31/2026
New York License No. 46000051059
Expires 6/16/2028



Erin C. Bowen, MAI
Director
Certified General Real Estate Appraiser
Arizona License No. 32052
Expires 12/31/2026
Oregon License No. C001551
Expires 6/30/2028
Iowa License No. CG04209
Expires 6/30/2028

ASSUMPTIONS AND LIMITING CONDITIONS

The fact witness services will be subject to the following assumptions and limiting conditions:

1. No responsibility is assumed for the legal description provided or for matter pertaining to legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated. The legal description used in this report is assumed to be correct.
2. The property is evaluated free and clear of any or all liens or encumbrances unless otherwise stated.
3. Responsible ownership and competent management are assumed.
4. Information furnished by others is believed to be true, correct and reliable, but no warranty is given for its accuracy.
5. All engineering studies are assumed to be correct. The plot plans and illustrative material in this report are included only to help the reader visualize the property.
6. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for obtaining the engineering studies that may be required to discover them.
7. It is assumed that the property is in full compliance with all applicable federal, state, and local and environmental regulations and laws unless the lack of compliance is stated, described, and considered in the evaluation report.
8. It is assumed that the property conforms to all applicable zoning and use regulations and restrictions unless nonconformity has been identified, described and considered in the evaluation report.
9. It is assumed that all required licenses, certificates of occupancy, consents, and other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.
10. It is assumed that the use of the land and improvements is confined within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in this report.
11. The date of value to which the findings are expressed in this report apply is set forth in the letter of transmittal. The appraisers assume no responsibility for economic or physical factors occurring at some later date which may affect the opinions herein stated.
12. Unless otherwise stated in this report, the existence of hazardous materials, which may or may not be present on the property, was not observed by the appraisers. The appraisers have no knowledge of the existence of such substances on or in the property. The appraisers, however, are not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation, radon gas, lead or lead-based products, toxic waste contaminants, and other potentially hazardous materials may affect the value of the property. The value estimate is predicated on the

assumption that there is no such material on or in the property that would cause a loss in value. No responsibility is assumed for such conditions or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.

13. The forecasts, projections, or operating estimates included in this report were utilized to assist in the evaluation process and are based on reasonable estimates of market conditions, anticipated supply and demand, and the state of the economy. Therefore, the projections are subject to changes in future conditions that cannot be accurately predicted by the appraisers, and which could affect the future income or value projections.
14. Fundamental to the appraisal analysis is the assumption that no change in zoning is either proposed or imminent, unless otherwise stipulated. Should a change in zoning status occur from the property's present classification, the appraisers reserve the right to alter or amend the value accordingly.
15. It is assumed that the property does not contain within its confined any unmarked burial grounds which would prevent or hamper the development process.
16. The Americans with Disabilities Act (ADA) became effective on January 26, 1992. We have not made a specific compliance survey and analysis of the property to determine if it is in conformance with the various detailed requirements of the ADA. It is possible that a compliance survey of the property, together with a detailed analysis of the requirements of the ADA, could reveal that the property is not in compliance with one or more of the requirements of the Act. If so, this fact could have a negative effect on the value of the property. Unless otherwise noted in this report, we have not been provided with a compliance survey of the property. Any information regarding compliance surveys or estimates of costs to conform to the requirements of the ADA are provided for information purposes. No responsibility is assumed for the accuracy or completeness of the compliance survey cited in this report, or for the eventual cost to comply with the requirements of the ADA.
17. Any value estimates provided in this report apply to the entire property, and any proration or division of the total into fractional interests will invalidate the value estimate, unless such proration or division of interests has been set forth in this report.
18. Any proposed improvements are assumed to have been completed unless otherwise stipulated; any construction is assumed to conform with the building plans referenced in this report.
19. Unless otherwise noted in the body of this report, this evaluation assumes that the subject does not fall within the areas where mandatory flood insurance is effective.
20. Unless otherwise noted in the body of this report, we have not completed nor are we contracted to have completed an investigation to identify and/or quantify the presence of non-tidal wetland conditions on the subject property.
21. This report should not be used as a basis to determine the structural adequacy/inadequacy of the property described herein, but for evaluation purposes only.
22. It is assumed that the subject structure meets the applicable building codes for its respective jurisdiction. We assume no responsibility/liability for the inclusion/exclusion of any structural

component item which may have an impact on value. It is further assumed that the subject property will meet code requirements as they relate to proper soil compaction, grading, and drainage.

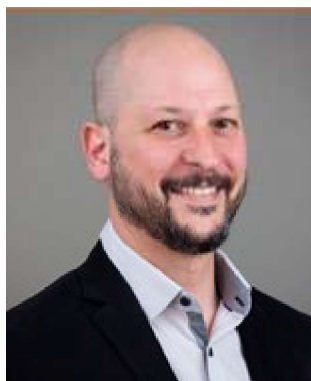
23. The appraisers are not engineers, and any references to physical property characteristics in terms of quality, condition, cost, suitability, soil conditions, flood risk, obsolescence, etc., are strictly related to their economic impact on the property. No liability is assumed for any engineering-related issues.

The evaluation services will be subject to the following limiting conditions:

1. The findings reported herein are only applicable to the properties studied in conjunction with the Purpose of the Evaluation and the Function of the Evaluation as herein set forth; the evaluation is not to be used for any other purposes or functions.
2. Any allocation of the total value estimated in this report between the land and the improvements applies only to the stated program of utilization. The separate values allocated to the land and buildings must not be used in conjunction with any other appraisal and are not valid if so used.
3. No opinion is expressed as to the value of subsurface oil, gas or mineral rights, if any, and we have assumed that the property is not subject to surface entry for the exploration or removal of such materials, unless otherwise noted in the evaluation.
4. This report has been prepared by CohnReznick under the terms and conditions outlined by the enclosed engagement letter. Therefore, the contents of this report and the use of this report are governed by the client confidentiality rules of the Appraisal Institute. Specifically, this report is not for use by a third party and CohnReznick is not responsible or liable, legally or otherwise, to other parties using this report unless agreed to in writing, in advance, by both CohnReznick and/or the client or third party.
5. Disclosure of the contents of this evaluation report is governed by the by-laws and Regulations of the Appraisal Institute has been prepared to conform with the reporting standards of any concerned government agencies.
6. The forecasts, projections, and/or operating estimates contained herein are based on current market conditions, anticipated short-term supply and demand factors, and a continued stable economy. These forecasts are, therefore, subject to changes with future conditions. This evaluation is based on the condition of local and national economies, purchasing power of money, and financing rates prevailing at the effective date of value.
7. This evaluation shall be considered only in its entirety, and no part of this evaluation shall be utilized separately or out of context. Any separation of the signature pages from the balance of the evaluation report invalidates the conclusions established herein.
8. **Possession of this report, or a copy thereof, does not carry with it the right of publication, nor may it be used for any purposes by anyone other than the client without the prior written consent of the appraisers, and in any event, only with property qualification.**

9. The appraisers, by reason of this study, are not required to give further consultation or testimony or to be in attendance in court with reference to the property in question unless arrangements have been previously made.
10. Neither all nor any part of the contents of this report shall be conveyed to any person or entity, other than the appraiser's client, through advertising, solicitation materials, public relations, news, sales or other media, without the written consent and approval of the authors, particularly as to evaluation conclusions, the identity of the appraisers or CohnReznick, LLC, or any reference to the Appraisal Institute, or the MAI designation. Further, the appraisers and CohnReznick, LLC assume no obligation, liability, or accountability to any third party. If this report is placed in the hands of anyone but the client, client shall make such party aware of all the assumptions and limiting conditions of the assignment.
11. This evaluation is not intended to be used, and may not be used, on behalf of or in connection with a real estate syndicate or syndicates. A real estate syndicate means a general or limited partnership, joint venture, unincorporated association or similar organization formed for the purpose of, and engaged in, an investment or gain from an interest in real property, including, but not limited to a sale or exchange, trade or development of such real property, on behalf of others, or which is required to be registered with the United States Securities and Exchange commissions or any state regulatory agency which regulates investments made as a public offering. It is agreed that any user of this evaluation who uses it contrary to the prohibitions in this section indemnifies the appraisers and the appraisers' firm and holds them harmless from all claims, including attorney fees, arising from said use.

ADDENDUM A: APPRAISER QUALIFICATIONS



Andrew R. Lines, MAI, CRE

Partner – Real Estate Valuation Valuation Advisory Services

1 S. Wacker Drive, Suite 3550
Chicago, IL 60606
312-508-5892 (w)
917-696-9636 (m)
andrew.lines@cohnreznick.com
www.cohnreznick.com

Andrew R. Lines, MAI, CRE is a Partner for CohnReznick Advisory's Valuation Advisory Services practice who has been a CohnReznick employee for fourteen years. Andrew has been involved in the real estate business for 25 years and has performed valuations on all real estate classes (industrial, commercial, residential, development land). Special-use valuations include affordable housing (as well as market studies), student housing, senior housing, cannabis facilities (indoor/outdoor, processing and dispensaries), landfills, waste transfer stations, golf courses, marinas, hospitals, universities, telecommunications facilities, data centers, self-storage facilities, racetracks, and corridors. Impact Study Reports have also been generated for zoning hearings related to the development of solar facilities, wind powered facilities, landfills, big box retail, waste transfer stations, private mental health clinics, cannabis dispensaries, concert/stadium venues and day care centers. He is also experienced in the valuation of leasehold, leased fee, and partial interests, as well as purchase price allocations (GAAP, IFRS and IRC 1060) for financial reporting.

Valuations have been completed nationwide for a variety of assignments including mortgage financing, litigation, tax appeal, estate gifts, asset management, workouts, and restructuring, as well as valuation for financial reporting including purchase price allocations (ASC 805), impairment studies, and appraisals for investment company guidelines and REIS standards. Andrew has qualified as an expert witness, providing testimony for cases in the states of IL, DC, VA, NY and MD, and for zoning hearings in IL, IN, MI, NY, HI, OH, KY, CO, PA, WI and MO. Andrew has also performed appraisal review assignments for accounting purposes (audit support), asset management, litigation and as an evaluator for a large Midwest regional bank.

Andrew has earned the professional designation of Member of the Appraisal Institute (MAI) and is also a Counselor of Real Estate (CRE). He has also qualified for certified general commercial real estate appraiser licenses in AZ, CA, IL, IN, WI, MD, OH, NY, NJ, FL, GA, KY and DC. Temporary licenses have been granted in CT, CO, PA, ID, MS, KS, MT and SC.

Education

- Syracuse University: Bachelor of Fine Arts
- MAI Designation (Member of the Appraisal Institute)

Professional Affiliations

- Counselors of Real Estate (CRE)
- Chicago Chapter of the Appraisal Institute
- International Real Estate Management (IREM)
- National Council of Housing and Market Analysts (NCHMA)

Disclaimer: This report is limited to the intended use, intended users (Mackinaw Solar LLC and Doral Renewables LLC), and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Erin C. Bowen, MAI

Director, Valuation Advisory Services

404-847-7740
erin.bowen@cohnreznick.com
www.cohnreznick.com

Erin Bowen, MAI is a Director with CohnReznick in Valuation Advisory Services, where she leads a team of appraisers across the country performing valuation and consulting services on a wide variety of real estate.

Ms. Bowen specializes in renewable energy, lodging, cannabis, seniors housing, large scale retail and multifamily conversion properties. Lodging work includes all hotel property types and brand segments including limited, full service and resort properties; additionally, Ms. Bowen has appraised numerous hotel to multifamily conversion properties including market rate and affordable housing. Cannabis work includes dispensaries, cultivation facilities including specialized indoor facilities and greenhouse properties, processing and manufacturing facilities. Senior's housing assignments include assisted living, skilled nursing facilities and rehabilitation centers. Retail work spans power centers, lifestyle centers, outlet centers and malls. She has appraised numerous additional properties including multifamily, office, medical office, industrial, churches, and vacant land.

Ms. Bowen has expertise in appraising properties at all stages of development, including existing as is, proposed, under construction, renovations and conversion to alternate use. Valuations have been completed nationwide for a variety of assignments including litigation, eminent domain, tax appeal, mortgage financing, estate gifts, asset management, as well as valuation for financial reporting including purchase price allocations (ASC 805). Ms. Bowen has worked on numerous appraisal assignments for eminent domain use for both condemner and land owner.

Additionally, Ms. Bowen has specialized in Property Value Impact Analysis, measuring the possible detrimental impact of economic and environmental influences on property values for a variety of property types, including cell towers, stadiums, behavioral health centers with an emphasis on renewable energy facilities including solar and wind. She has qualified as an expert witness and testified in front of power siting boards, zoning boards and planning commissions in New Mexico, Ohio, Michigan, Kentucky, Indiana and Illinois.

Education

- University of California, San Diego: Bachelor of Arts in Psychology and Theater; College Honors

Professional Affiliations

- Designated Member of the Appraisal Institute

Licenses

- Active licenses in AZ, CA, NV, IA, NM, TX and OR

Disclaimer: This report is limited to the intended use, intended users (Mackinaw Solar LLC and Doral Renewables LLC), and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick Advisory LLC.



Joe Ficenec

Senior Consultant, Valuation Advisory Services

621 Capital Mall
Sacramento, CA 95814
916-930-5237
joe.ficenec@cohnreznick.com
www.cohnreznick.com

Joe Ficenec is a senior consultant in CohnReznick Advisory LLC's Valuation Advisory Services practice and is based in the Sacramento office. Joe specializes in Impact Study Reports, which have been conducted for zoning hearings related to the development of solar facilities and wind powered facilities. Joe has experience in attending public information meetings to address concerns regarding the impact of solar and wind powered facilities on local real estate values. He also has experience in assisting with the appraisal multifamily, office, industrial, retail, lodging and mixed-use properties for financing and purchase price allocation purposes.

Joe graduated with honors from the University of California, Davis in May 2017 with a major in managerial economics. Prior to joining CohnReznick, Joe worked as a Real Estate Assessor for a county government and as a consultant for a nationwide real estate firm in San Francisco.

Education

- University of California, Davis – B.S. Managerial Economics

Exhibit W
Economic Impact Analysis



Strategic
Economic
Research, LLC

ECONOMIC IMPACT ANALYSIS OF THE MACKINAW SOLAR PROJECT

August 2026

strategiceconomic.com

About Strategic Economic Research

Strategic Economic Research, LLC (SER) specializes in economic impact and local tax analyses for energy projects throughout the United States. Our reports show the jobs, earnings, output, and tax revenues that these projects bring to local communities. We have analyzed over 700 projects (over 132 gigawatts of power) in 40 states. Primarily working on renewable energy projects, including wind, solar, and storage, we also produce analyses for other projects, including transmission, natural gas, nuclear, data centers, and more. In addition to written reports, the SER team combines years of experience to provide expert testimony for permitting of energy projects. Dr. David G. Loomis, the founder and President of SER, is a widely-recognized expert in energy economics.



MEET THE AUTHORS



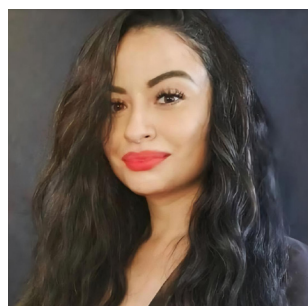
David G. Loomis, PhD
President



Bryan Loomis, MBA
Vice President



Christopher Thankan, BS
*Director of
Economic Analysis*



Deborah Dingess, MST
*Director of
Tax Research*



Timothy Roberts
*Manager of Data Analysis,
Tax Team Lead*



Sawyer Keithley, MS
*Manager of
Research & Analysis*

LEARN MORE



strategiceconomic.com/about

SER has grown to over 25 employees across the country. For more information about the associates who contribute to our reports, visit the link above.

I. Executive Summary	1
II. Energy Industry Growth & Economic Development	3
a. U.S. Solar PV Industry Growth.	3
b. Illinois Solar PV Industry	5
c. Economic Benefits of Utility-Scale Solar PV Energy	9
III. Project Description and Location.	11
a. Mackinaw Solar Project	11
b. Tazewell County Economic and Demographic Statistics.	11
IV. Economic Impact Methodology	15
V. Economic Impact Results.	17
VI. Local Taxes	21
VII. Appendix.	27
VIII. Glossary	35
IX. References	37
X. Curriculum Vitae (Abbreviated)	39



Table of Contents - Figures

Figure 1.1 – Total Local Taxes Paid by the Mackinaw Solar Project	2
Figure 2.1 – U.S. Annual and Cumulative Utility-Scale Solar Capacity Growth, 2009 – Q4, 2025	3
Figure 2.2 – Installed Costs of Utility-Scale Solar from 2010 to 2024 (adjusted for inflation)	4
Figure 2.3 – U.S. Solar PV Installations from 2014 to 2036	4
Figure 2.4 – Solar Company Locations in Illinois	6
Figure 2.5 – Illinois Annual Solar Installations	6
Figure 2.6 – Electric Generation by Fuel Type for Illinois in 2024	7
Figure 2.7 – Electric Generation Employment by Technology	8
Figure 3.1 – Location of Tazewell County, Illinois	11
Figure 3.2 – Total Employed Persons in Tazewell County from 2010 to 2024	12
Figure 3.3 – Unemployment Rate in Tazewell County from 2010 to 2024	13
Figure 3.4 – Population in Tazewell County from 2010 to 2024	13
Figure 3.5 – Real Median Household Income in Tazewell County from 2010 to 2024	14
Figure 3.6 – Real GDP in Tazewell County from 2010 to 2024	14
Figure 5.1 – Total Employment Impacts from the Mackinaw Solar Project	18
Figure 5.2 – Total Earnings Impacts from the Mackinaw Solar Project	19
Figure 5.3 – Total Output Impacts from the Mackinaw Solar Project	20
Figure 6.1 – Percentages of Local Taxes Paid to Taxing Jurisdictions	22

Table of Contents - Tables

Table 2.1 – Illinois Solar Projects	5
Table 3.1 – Employment by Industry in Tazewell County	12
Table 5.1 – Total Employment Impacts from the Mackinaw Solar Project.....	17
Table 5.2 – Total Earnings Impacts from the Mackinaw Solar Project.....	19
Table 5.3 – Total Output Impacts from the Mackinaw Solar Project	20
Table 6.1 – Total Local Taxes Paid by the Mackinaw Solar Project	22
Table 6.2 – Local Taxes from the Mackinaw Solar Project for the County & Other Taxing Bodies	23
Table 6.3 – Local Taxes from the Mackinaw Solar Project for Other Taxing Bodies	24
Table 6.4 – Local Taxes from the Mackinaw Solar Project for the School District.....	25
Table 7.1 – Local and Statewide Compensation by Occupation	27
Table 7.2 – Occupational Description and Future Outlook.....	28,29
Table 7.3 – Occupational Output from IMPLAN Construction Model, Direct Jobs, Employment Greater than 1.0.....	30
Table 7.4 – Occupational Output from IMPLAN Construction Model, Indirect Jobs, Employment Greater than 1.0.....	31
Table 7.5 – Occupational Output from IMPLAN Construction Model, Induced Jobs, Employment Greater than 1.0.....	32,33

I. Executive Summary

Doral is developing the Mackinaw Solar Project (the Project) in Tazewell County, Illinois. The purpose of this report is to aid decision makers in evaluating the economic impacts of this Project on Tazewell County and the State of Illinois. The basis of this analysis is to study the direct, indirect, and induced impacts on job creation, wages, and total economic output.

Mackinaw Solar | 500 MWac



The Mackinaw Solar Project is a 500-megawatt alternating current (MWac) utility-scale solar-powered electric generation facility that will utilize photovoltaic (PV) panels installed on a single-axis tracking system. The total Project represents an investment in excess of \$600 million. The total development is anticipated to result in the following:



Jobs¹

- 610 new local jobs during construction for Tazewell County
- 1,313 new local jobs during construction for the State of Illinois
- 48.0 new local long-term jobs for Tazewell County
- 72.3 new local long-term jobs for the State of Illinois



Earnings²

- Over \$67.0 million in new local earnings during construction for Tazewell County
- Over \$142 million in new local earnings during construction for the State of Illinois
- Over \$3.2 million in new local long-term earnings for Tazewell County annually
- Over \$5.2 million in new local long-term earnings for the State of Illinois annually

¹ All jobs values are full-time equivalents (FTEs) and are the sum of the direct, indirect, and induced jobs during construction and annual operations which can be found in the Economic Impact Results section.

² Earnings are a measurement in dollars of the total wages and benefits produced by the jobs found by the analysis. These earnings are categorized by construction impacts and operations impacts.

Output³

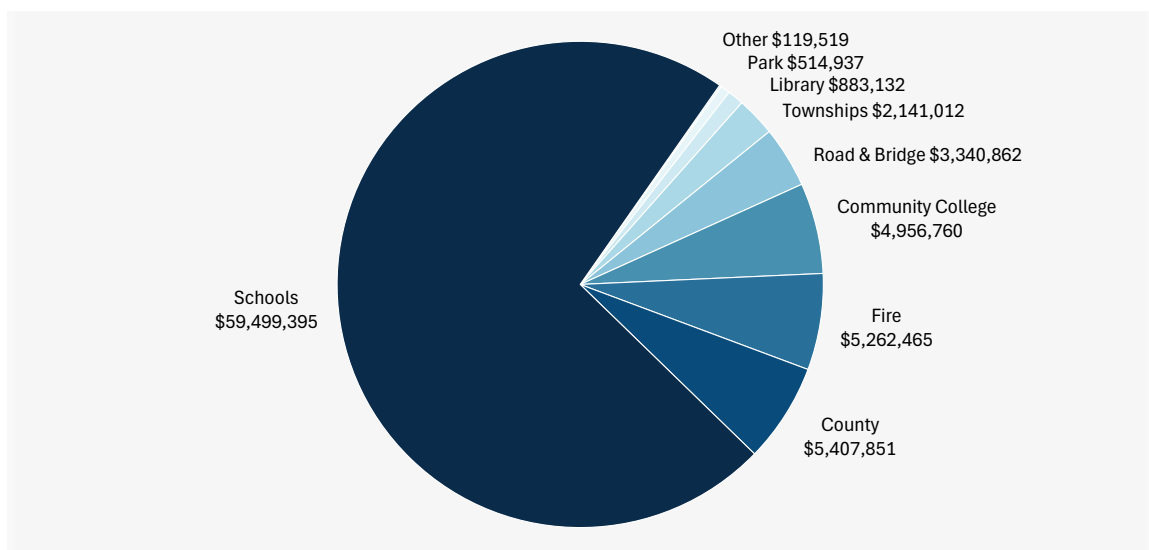
- Over \$134 million in new local output during construction for Tazewell County
- Over \$296 million in new local output during construction for the State of Illinois
- Over \$8.4 million in new local long-term output for Tazewell County annually
- Over \$14.4 million in new local long-term output for the State of Illinois annually

Local Taxes

- Over \$59.4 million in total school district taxes over the life of the Project
- Over \$5.4 million in total county taxes for Tazewell County over the life of the Project
- Over \$82.1 million in total local taxes for all taxing districts over the life of the Project

Over \$82.1 Million in Total Local Taxes

Figure 1.1 – Total Local Taxes Paid by the Mackinaw Solar Project

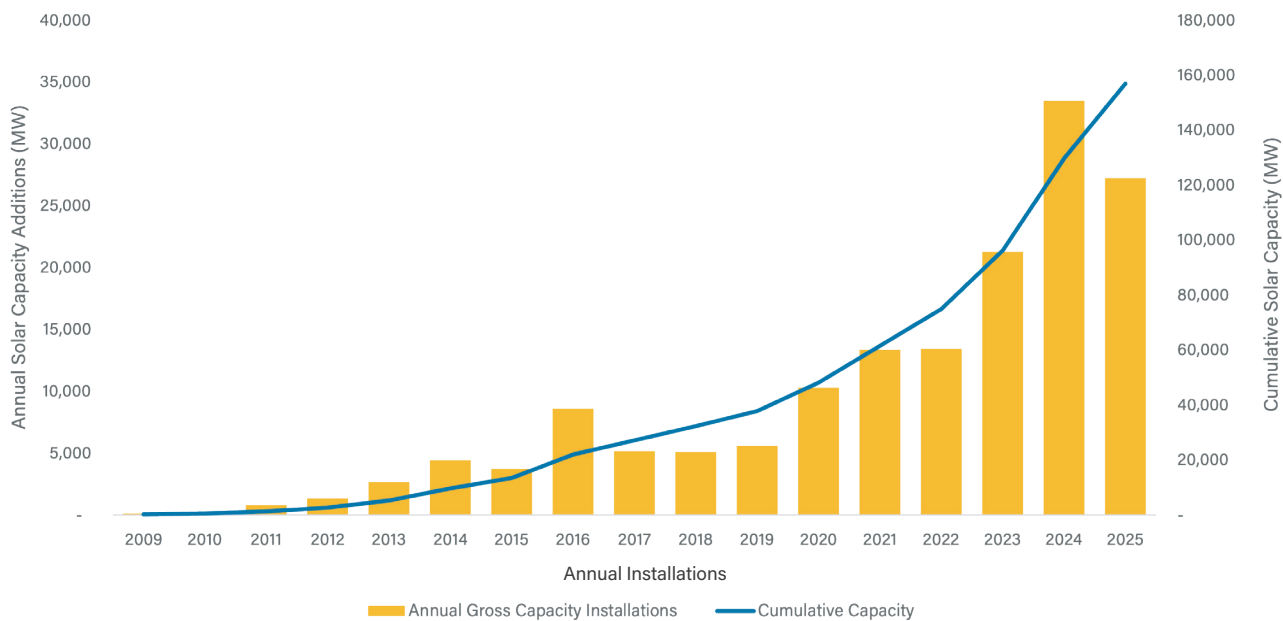


³ The value of production in the state or local economy. It is an equivalent measure to the Gross Domestic Product (GDP).

a. U.S. Solar PV Industry Growth

The U.S. solar industry is growing at a rapid but uneven pace. Solar energy systems are installed for on-site use — including residential, commercial, and industrial properties — and utility-scale solar-powered electric generation facilities intended for wholesale distribution. The Mackinaw Solar Project is a utility-scale solar PV project intended for wholesale markets through the transmission grid. From 2013 to 2018, the amount of solar-generated electricity more than quadrupled, increasing by 444% (Solar Energy Industries Association (SEIA), 2020). The industry has continued to add PV systems to the grid. Figure 2.1 shows the historical capacity additions (American Clean Power Association (ACP), 2025). The primary driver of this overall sharp pace of growth is large price declines in solar equipment.

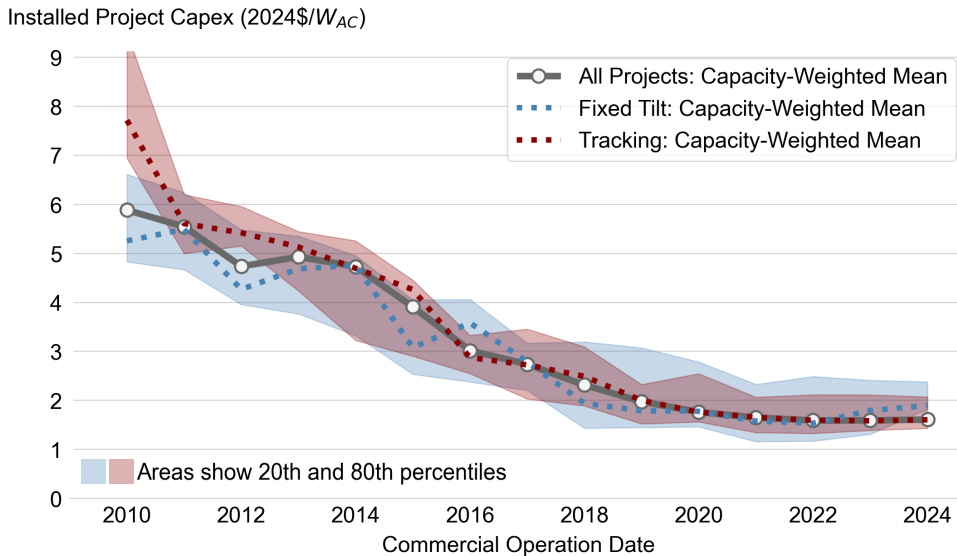
Figure 2.1 – U.S. Annual and Cumulative Utility-Scale Solar Capacity Growth, 2009 – Q4, 2025



Source: ACP, Clean Power Market Report, Q4 2025



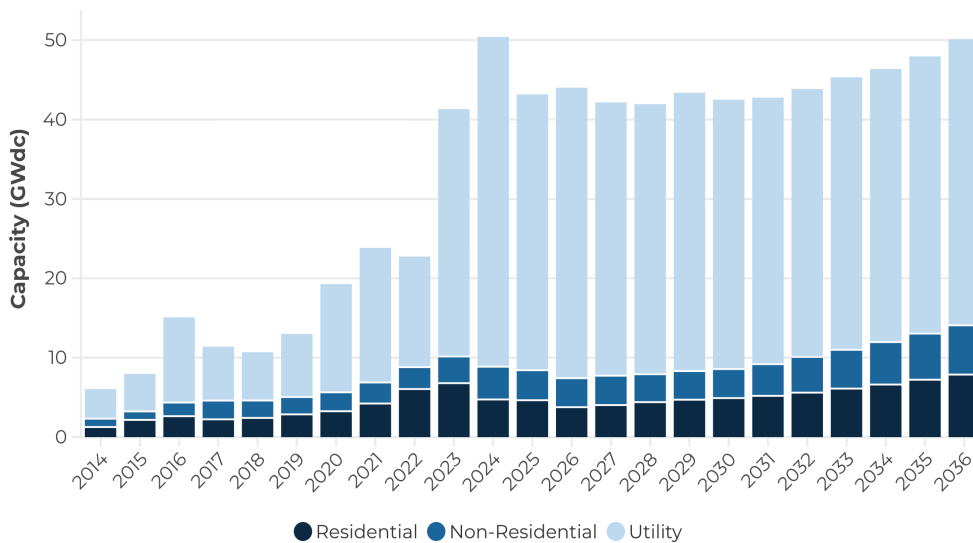
Figure 2.2 – Installed Costs of Utility-Scale Solar from 2010 to 2024 (adjusted for inflation)



According to Figure 2.2, utility-scale solar fixed tilt and single-axis tracking have decreased from an average of \$6/watt in 2010 to slightly more than \$1/watt in 2024.

Source: Lawrence Berkeley National Laboratory, Utility-Scale Solar, 2025 Edition

Figure 2.3 – U.S. Solar PV Installations from 2014 to 2036



According to Figure 2.3, annual solar PV installations are expected to reach around 35 GWdc from 2026 to 2030. Approximately 381 GWdc of utility-scale solar PV will be installed from 2026 to 2036 (SEIA, 2025).

Source: SEIA, Solar Market Insight Report 2025 Year in Review

b. Illinois Solar PV Industry

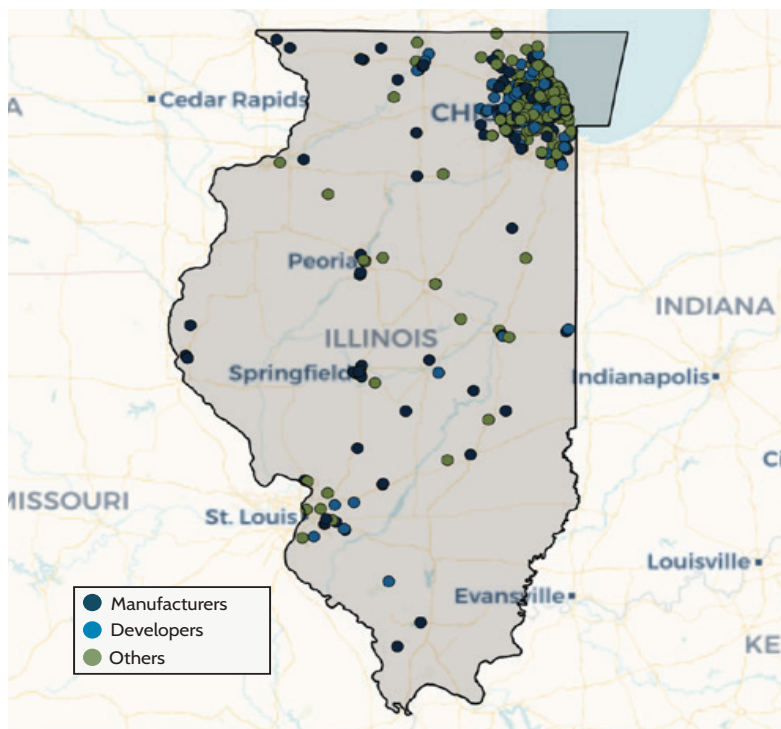
According to the SEIA, Illinois is ranked 10th in the U.S. cumulative installations of solar PV. Texas, California, and Florida are the top three states for utility-scale solar PV which may not be surprising because of the high solar irradiance that they receive (ACP, Q4, 2025). However, there are other states with similar solar irradiance to Illinois that rank highly for utility-scale solar. In 2025, Illinois installed 1.7 GW of solar electric capacity, bringing its cumulative capacity to 7.4 GW.

Illinois has great potential to expand its solar installations. Table 2.1 has a list of the utility-scale solar farms in operation in Illinois through 2026 (some small projects below 70 MW were omitted from the table). The 500-MW Mackinaw Solar Project will be one of the largest installations in Illinois to date. (The megawatts listed in this paragraph are MWac. To convert to MWdc, multiply the MWac by 1.3 to get the approximate MWdc capacity.)

Table 2.1 – Illinois Solar Projects

Utility-Scale Solar Farm	Capacity (MW)	County Name	Year Online
Prairie Wolf	200	Coles County	2021
Dressor Plains	99	Fayette County	2021
Prairie State Solar Project	99	Perry County	2021
Big River	149	White County	2022
Amazon Solar Farm Illinois - Junction	100	Lee County	2022
Mulligan	70	Logan County	2022
River Ferry Solar	150	Clark County	2023
High Point	100	Stephenson County	2023
Double Black Diamond Solar	592.8	Sangamon County	2024
Maple Flats	250	Clay County	2024
Boomtown Solar Project	150	White County	2024
Cass County Solar	150	Cass County	2024
Wolf Run	140	Morgan County	2024
Hickory Solar	110	Jersey County	2024
Emily Solar (County Run)	274	Clark and Cumberland Counties	2025
Eldorado Solar	270	Saline County	2025
Casey Fork Solar	150	Jefferson County	2025
Pleasantville Solar	150	Fulton County	2025
Tilden Solar	150	Randolph County	2025
Prairie	135	Champaign County	2026
Prairie Wolf	200	Coles County	2021
Dressor Plains	99	Fayette County	2021
Prairie State Solar Project	99	Perry County	2021
Big River	149	White County	2022
Amazon Solar Farm Illinois - Junction	100	Lee County	2022

Figure 2.4 – Solar Company Locations in Illinois

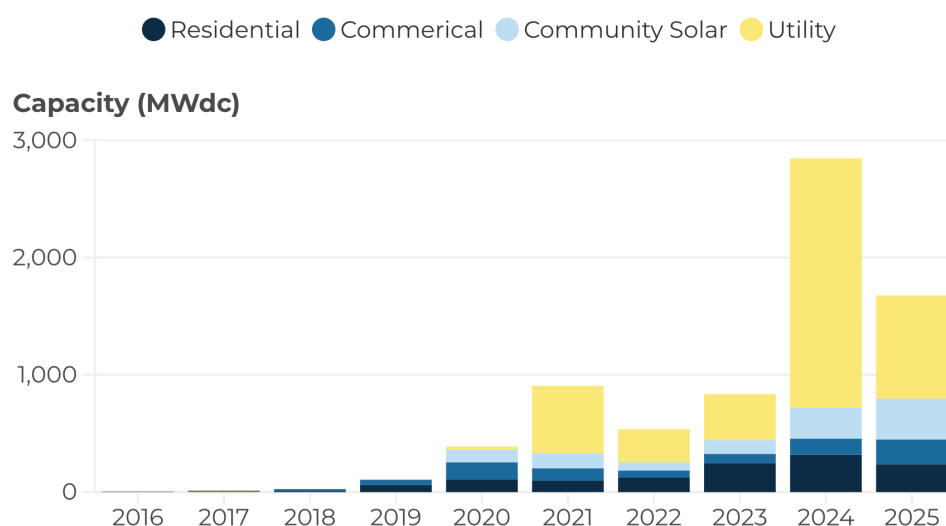


Source: SEIA, Solar Spotlight: Illinois Q4 2025

There are 376 solar companies in Illinois including 92 manufacturers, 101 installers/developers, and 183 others (“other” includes sales and distribution, project management, and engineering). Figure 2.4 shows the locations of solar companies in Illinois at the time of this report. Currently, there are 5,905 solar jobs in the State of Illinois according to SEIA.

Figure 2.5 shows the Illinois historical installed capacity by year according to the SEIA. Solar installation saw huge growth in 2024 and is forecasted to continue to grow. Over the next five years, solar in Illinois is projected to grow by 11.9 GW.

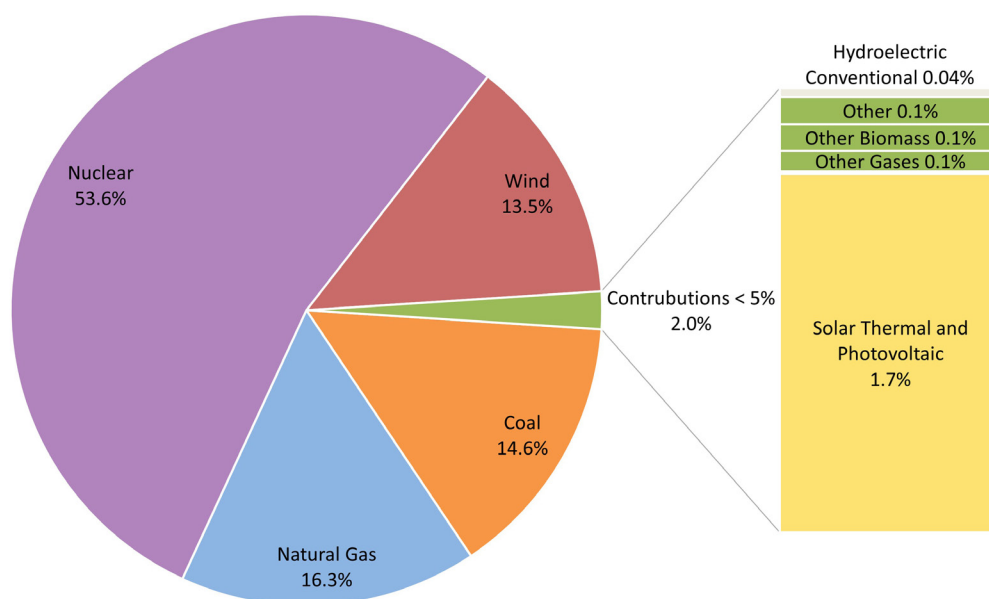
Figure 2.5 – Illinois Annual Solar Installations



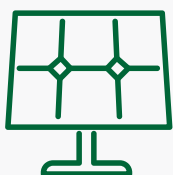
Source: SEIA, Solar Spotlight: Illinois Q4 2025

The Energy Information Administration (EIA) calculated the number of megawatt-hours generated from different energy sources in 2024. As shown in Figure 2.6, the greatest percentage of electricity generated in Illinois came from nuclear energy with 53.6% followed by natural gas with 16.3% and coal with 14.6%. Approximately 1.7% of the total electricity power generated in Illinois came from solar thermal and solar PV in 2024.

Figure 2.6 – Electric Generation by Fuel Type for Illinois in 2024

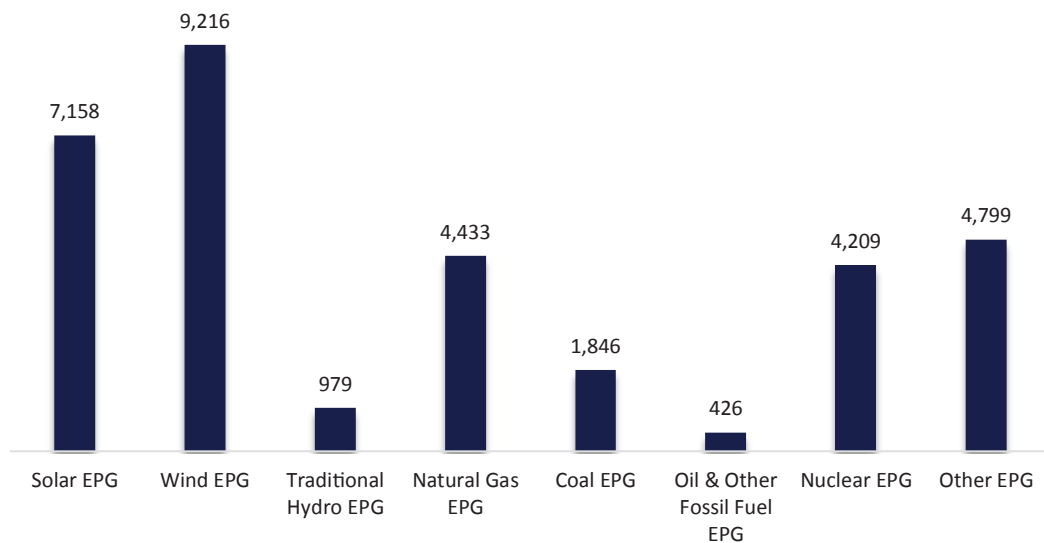


Source: U.S. EIA: Illinois 2024



The U.S. Department of Energy sponsors the U.S. Energy and Employment Report each year. Electric Power Generation (EPG) covers all utility and non-utility employment across electric generating technologies, including fossil fuels, nuclear, and renewable technologies. It also includes employees engaged in facility construction, turbine and other generation equipment manufacturing, operations and maintenance, and wholesale parts distribution for all electric generation technologies. According to Figure 2.7, employment in Illinois in the solar energy industry (7,158) falls behind wind electric generation (9,216) but is larger than natural gas generation (4,433) and nuclear electric generation (4,209).

Figure 2.7 – Electric Generation Employment by Technology



Source: U.S. Energy and Employment Report 2025: Illinois



c. Economic Benefits of Utility-Scale Solar PV Energy

Utility-scale solar-powered electric generation facilities provide numerous economic benefits. Solar PV installations create job opportunities in the local area during both the short-term construction phase and the long-term operational phase.

In addition to the workers directly involved in the construction and maintenance of the solar energy project, numerous other jobs are supported through indirect supply chain purchases and the higher spending that is induced by these workers. Solar PV projects strengthen the local tax base and help improve county services and local infrastructure, such as public roads.

Bessette et al. (2024) state that the potential economic benefits of a utility-scale solar project would include “increased property tax revenue, landowner payments, and increased employment” (Bessette et al., 2024, p. 7). They highlight the fact that the tax benefits are difficult for residents to understand – perhaps because they are not quantified clearly. They also mention both the direct and indirect (supply chain) economic impacts.



Solar PV installations create job opportunities in the local area during both the short-term construction phase and the long-term operational phase.

Numerous studies have quantified the economic benefits of United States solar PV projects and have been published in peer-reviewed academic journals using the same methodology as this report. Some of these studies examine smaller-scale solar systems while some examine utility-scale solar energy. Croucher (2012) uses NREL’s Jobs and Economic Development Impacts (“JEDI”) modeling methodology to determine which states would receive the greatest economic impact from installing one hundred 2.5 kilowatt (kW) residential systems. According to the report, Pennsylvania ranked first, supporting 28.98 jobs during installation and 0.20 jobs during operations. Illinois ranked second, supporting 27.65 jobs during construction and 0.18 jobs during operations.

More recently, Michaud et al. (2020) performed economic impact analyses of utility-scale solar energy projects in the State of Ohio. They detail three scenarios: low (2.5 gigawatt (GW)), moderate (5 GW), and high (7.5 GW). Using the JEDI model, they conclude that between 18,039 and 54,113 jobs would be supported during construction and between 207 and 618 jobs would be supported annually during operations. In addition, these projects would generate between \$22.5 million and \$67.5 million annually in tax revenues.

Input-Output analysis is the basis for the methodology used in the economic impact analysis of this report.

Loomis et al. (2016) estimate the economic impact for the State of Illinois if it were to reach its maximum potential for solar PV. This study details three different scenarios — new solar project installations of either 2,292 MW, 2,714 MW, or 11,265 MW. The study assumes that 60% of the capacity is utility-scale solar, 30% of the capacity is commercial, and 10% of the capacity is residential. It concludes that employment impacts would vary from 26,753 to 131,779 job-years during construction and from 1,223 to 6,010 job-years during operations.

Barnes et al. (2025) measured the economic impact of the U.S. solar industry in their study. Their assessment includes residential, commercial, and industrial uses of solar at the rooftop, community, and utility-scale levels. In addition to national results, they estimate state-level results using the same input-output model used in this study. For Illinois, they estimate that the 835.3 MW of solar PV systems installed in 2023 (bringing the state's total solar PV capacity to 2,903 MW) resulted in 10,700 jobs, \$914.7 million in labor income, and \$1.95 billion in economic output.

Finally, Jenniches (2018) performed a literature review assessing the regional economic impacts of renewable energy sources. After reviewing all of the different techniques for analyzing the economic impacts, he concludes “for assessment of current renewable energy developments, beyond employment in larger regions, IO [Input-Output] tables are the most suitable approach” (Jenniches, 2018, p. 48). Input-Output analysis is the basis for the methodology used in the economic impact analysis of this report.

III. Project Description and Location

a. Mackinaw Solar Project

Doral is developing the Mackinaw Solar Project in Tazewell County, Illinois. The Project consists of an estimated 500-MWac utility-scale solar-powered electric generation facility that will utilize PV panels installed on a single-axis tracking system. The total Project represents an investment in excess of \$600 million.

b. Tazewell County Economic and Demographic Statistics

Tazewell County is located in the central part of Illinois (see Figure 3.1). It has a total area of 658 square miles, and the U.S. Census estimates that the population was 129,821 with 58,902 housing units in 2024. The county has a population density of 200 (persons per square mile) compared to 229 for the State of Illinois (2025). Median household income in the county was \$77,982 in 2024 (U.S. Census Bureau, 2024).

Figure 3.1 – Location of Tazewell County, Illinois



Source: Wikipedia, 2024. Data from [nationalatlas.gov](https://www.nationalatlas.gov)

Table 3.1 – Employment by Industry in Tazewell County

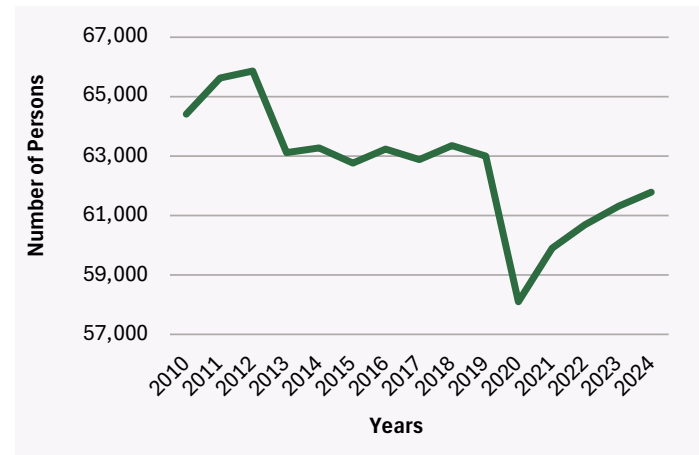
Industry	Number	Percent
Retail Trade	7,682	12.2%
Administrative Government	6,805	10.8%
Accommodation and Food Services	6,414	10.2%
Manufacturing	6,318	10.1%
Health Care and Social Assistance	4,908	7.8%
Other Services (except Public Administration)	4,595	7.3%
Construction	4,162	6.6%
Transportation and Warehousing	3,882	6.2%
Professional, Scientific, and Technical Services	3,461	5.5%
Finance and Insurance	3,337	5.3%
Wholesale Trade	2,438	3.9%
Real Estate and Rental and Leasing	2,016	3.2%
Administrative and Support and Waste Management and Remediation Services	1,827	2.9%
Arts, Entertainment, and Recreation	1,292	2.1%
Agriculture, Forestry, Fishing and Hunting	1,116	1.8%
Management of Companies and Enterprises	771	1.2%
Information	689	1.1%
Educational Services	434	0.7%
Utilities	256	0.4%
Government Enterprises	238	0.4%
Mining, Quarrying, and Oil and Gas Extraction	115	0.2%

Source: IMPLAN, County Employment by Industry, 2024

As shown in Table 3.1, the largest industries in the county are "Retail Trade," "Administrative Government," and "Accommodation and Food Services." These data for Table 3.1 come from IMPLAN covering the year 2024 (the latest year available).

Table 3.1 provides the most recent snapshot of total employment but does not examine the historical trends within the county.

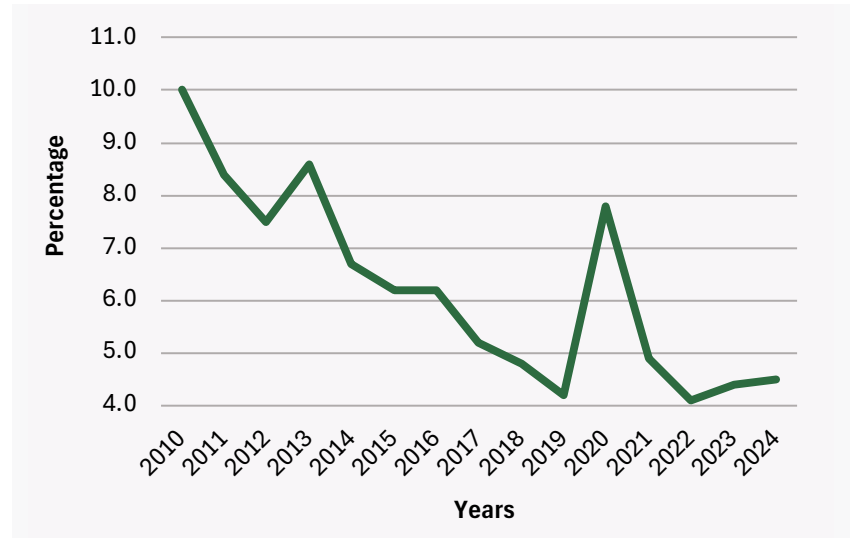
Figure 3.2 shows the number of employed persons in Tazewell County from 2010 to 2024. The total number of employed persons was at its highest at 65,879 in 2012 and its lowest at 58,101 in 2020 (FRED, 2025).

Figure 3.2 – Total Employed Persons in Tazewell County from 2010 to 2024

Source: FRED, U.S. Census Bureau, Employed Persons, 2010-2024

The unemployment rate signifies the percentage of the labor force without employment in the county. Figure 3.3 shows the unemployment rates from 2010 to 2024. Unemployment in Tazewell County was at its highest at 10% in 2010 and its lowest at 4.1% in 2022 (FRED, 2025). The unemployment rate spiked to 7.8% in 2020 then normalized.

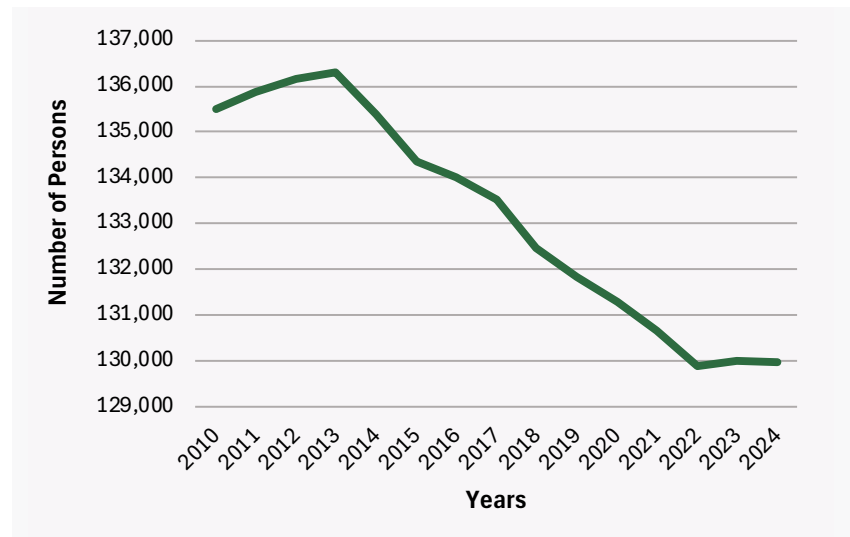
Figure 3.3 – Unemployment Rate in Tazewell County from 2010 to 2024



Source: FRED, U.S. Census Bureau, Unemployment Rates, 2010-2024

The overall population in the county has trended downward, as shown in Figure 3.4. Tazewell County's population was 135,487 in 2010 and 129,982 in 2024, a loss of 5,505 people (FRED, 2025). The average annual population decrease over this time period was 393 people.

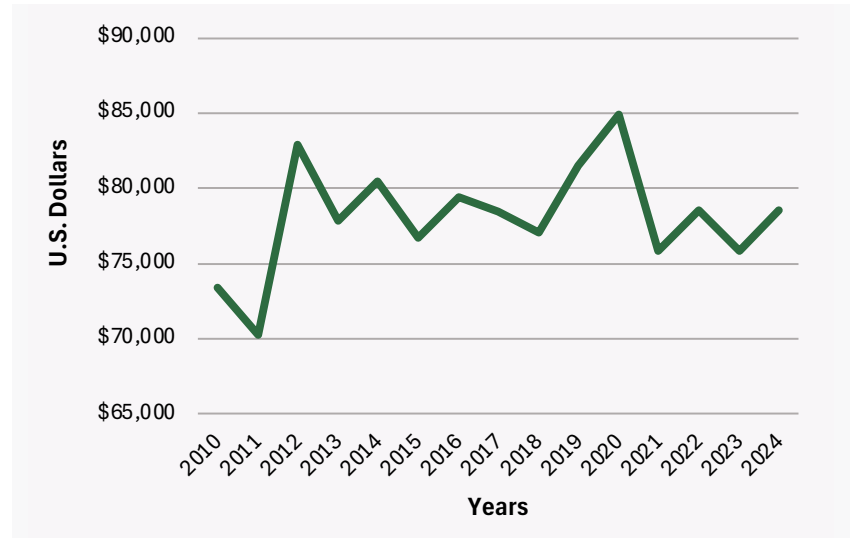
Figure 3.4 – Population in Tazewell County from 2010 to 2024



Source: FRED, U.S. Census Bureau, Population Estimates, 2010-2024

Household income has fluctuated in the county. Figure 3.5 shows the real median household income in Tazewell County from 2010 to 2024. Using the national Consumer Price Index (CPI), the nominal median household income for each year was adjusted to 2024 dollars. Household income was at its lowest at \$70,224 in 2011 and its highest at \$84,865 in 2020 (FRED, 2025).

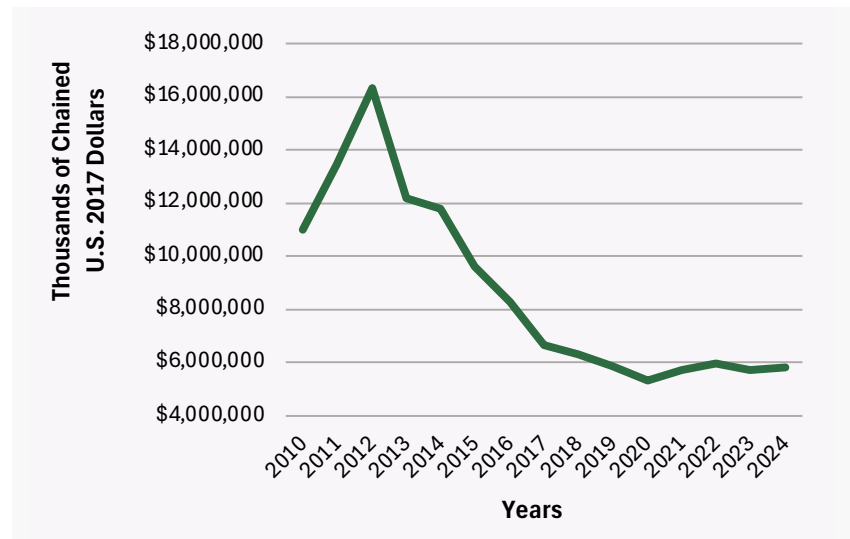
Figure 3.5 – Real Median Household Income in Tazewell County from 2010 to 2024



Source: FRED, U.S. Census Bureau, Estimate of Median Household Income, 2010-2024

Real Gross Domestic Product (GDP) is a measure of the value of goods and services produced in an area and adjusted for inflation over time. The Real GDP for Tazewell County has trended downward since hitting a high in 2012, as shown in Figure 3.6 (FRED, 2025).

Figure 3.6 – Real GDP in Tazewell County from 2010 to 2024



Source: FRED, U.S. Census Bureau, Real GDP, 2010-2024

IV. Economic Impact Methodology

The economic analysis of the Project was created using IMPLAN. IMPLAN software and parameters are based on government data collected at federal, state, and local levels. IMPLAN is a leading provider of economic development software that is widely used by economists and economic development professionals. More information about IMPLAN can be found at implan.com.

IMPLAN is an input-output model that measures the spending patterns and location-specific economic structures that reflect expenditures supporting varying levels of employment, income, and output. IMPLAN demonstrates how one industry's output can be used as an input for another. For example, when a PV system is installed, there are both soft costs — consisting of permitting, installation, and customer acquisition costs — and hardware costs, of which the PV module is the largest component. The purchase of a module not only increases demand for manufactured components and raw materials, but it also supports the labor required to build and install the module. When a module is purchased from a manufacturing facility, the manufacturer uses some of that money to pay its employees, who then spend that money on goods and services within their community. Likewise, when a developer pays installation workers, those workers spend money in the local economy which boosts economic activity and supports employment in other sectors. The goal of an economic impact analysis is to quantify all reverberations throughout the county and state economies.

IMPLAN modeling uses construction cost data, operations cost data, and data relating to the percentage of goods and services acquired in the county and state to calculate the jobs, earnings, and economic output associated with this information. The results are split into the construction period and the annual operations period of a solar project. Within each period, impacts are further categorized into direct, indirect, and induced impacts.



Direct Impacts

Direct impacts during the construction period refer to the changes that occur in the on-site construction industries in which the direct final demand (i.e., spending on construction labor and services) change is made. On-site construction-related services include installation labor, engineering, design, and other professional services. **Direct impacts during operating years** refer to the final demand changes in on-site spending required for solar operations and maintenance workers, their managers, and administrative staff.



Indirect Impacts

The initial spending for a project's construction and operation will create a second layer of impacts, referred to as "supply chain impacts" or "indirect impacts." **Indirect impacts during the construction period** consist of changes in inter-industry purchases resulting from the direct final demand changes. These impacts stem from construction spending on solar farm materials (PV modules, inverters, tracking systems, cabling, foundations, etc.) as well as purchases of offsite services like materials transportation, road repair, accounting, legal guidance, etc. **Indirect impacts during the operations period** also consist of changes in inter-industry purchases resulting from the direct final demand changes, but these impacts result from spending on equipment/materials pertaining to a solar farm's annual operations and maintenance. Tax payments during annual operations create indirect impacts in the county and state that show up in the operations portion of the results. These payments do not support the day-to-day operations and maintenance of the solar farm; they are more of a latent effect resulting from the solar farm's presence.



Induced Impacts

Induced impacts during construction refer to the changes that occur in consumer spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes during construction. Local employees (working directly or indirectly on a project), who spend their paychecks in the community, support additional local jobs and economic activity. For example, in-county and in-state construction workers constructing the solar farm will spend a portion of their wages in the local economy at restaurants, grocery and retail stores, entertainment, hospitals, medical offices, etc. **Induced impacts during operating years** refer to the changes that occur in consumer spending as household income increases or decreases as a result of the direct and indirect effects from final demand changes during annual operations and maintenance work. For example, when on-site solar technicians and contracted landscapers residing in-county and in-state are paid for their work on the solar farm, they can then spend their wages at local establishments which spurs more local economic activity.

To estimate the economic impacts of a project, SER uses two separate Multi-Regional Input-Output (MRIO) IMPLAN models with 2024 economic data, the most recent data year available at the time of analysis. The first IMPLAN model calculates construction period impacts using project-specific county economic data in conjunction with aggregated economic data that is combined from every other county in the state. Costs are then assigned to either region according to client-provided expected spending patterns, SER industry knowledge honed from over 500 previous analyses, and IMPLAN data related to the availability of relevant goods and services within the county and state economies. When results for the two regions are combined, they create the state's total construction period impacts. This method allows for more precise assignment of construction spending within a project's county and/or state.

The second model calculates impacts stemming from the annual operations and maintenance of a solar project. Like the construction period model, the operations period model also utilizes economic data from both a project's county and a region comprised of every other county in the state combined. Results from these two regions create the state's total annual operations period economic impacts.

The majority of project employees needed during the construction phase are construction workers, but other occupations are contributing as well. In addition, occupations other than solar technicians are involved during a project's operations phase. A sample of those occupations, the education/training they require, and wage percentiles are contained in Table 7.1 in the Appendix. A larger description of those occupations, including their work environment and future growth potential, is located in Table 7.2 in the Appendix.

SER analyzes the gross number of jobs a new solar project development supports but not the potential loss of jobs due to declines in other forms of electricity generation. Impacts are determined by the robustness and applicability of the county and state economies, the client's intended spending in those geographic areas, and relevant labor levels.

The economic impact results⁴ were derived from detailed project cost estimates supplied by Doral. In addition, Doral and SER estimated the percentages of project materials and labor that will be coming from within Tazewell County and the State of Illinois.

The results from these models are shown in Tables 5.1 to 5.3. Table 5.1 lists the Project's total employment impacts for Tazewell County and the State of Illinois. Table 5.2 shows the total earnings impacts, and Table 5.3 contains the total output impacts. The results are divided into one-time construction impacts and ongoing annually recurring operations impacts that are expected to last the Project's lifetime. Project Development and On-site Labor Impacts correspond to direct impacts as defined in the methodology section. Supply Chain Impacts are the indirect impacts during construction, and Local Revenue and Supply Chain Impacts are indirect impacts during operations.

Table 5.1 – Total Employment Impacts from the Mackinaw Solar Project

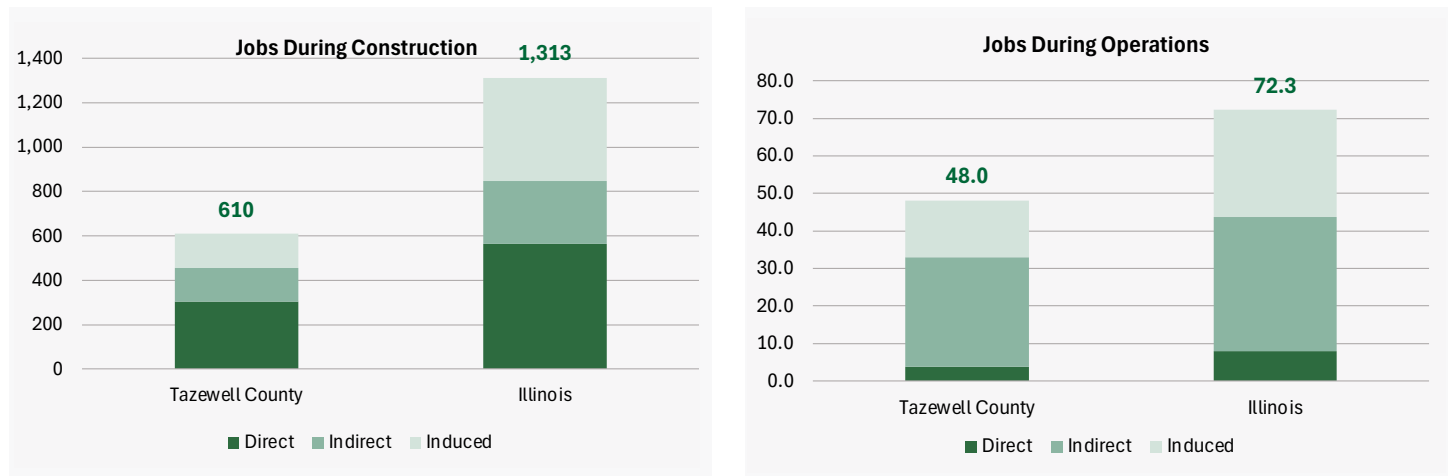
	Tazewell County Jobs	State of Illinois Jobs
Construction		
Project Development and On-site Labor Impacts	305	564
Supply Chain Impacts	150	283
Induced Impacts	155	466
<i>Local Jobs during Construction</i>	610	1,313
Operations (Annual/Ongoing)		
On-site Direct Impacts	3.9	7.9
Local Revenue and Supply Chain Impacts	29.0	35.8
Induced Impacts	15.1	28.6
<i>Local Long-Term Jobs</i>	48.0	72.3

⁴ Results are not intended to be a precise forecast; they are an estimate of potential activity resulting from a specific set of intended costs and assumed spending in-county and in-state.

The results from the IMPLAN model show significant employment impacts from the Mackinaw Solar Project. Direct jobs created during the construction phase typically last anywhere from 12 to 18 months depending on the size of the project; however, the direct job numbers present in Table 5.1 from the IMPLAN model are based on a full-time equivalent (FTE) basis for a year. In other words, 1 job = 1 FTE = 2,080 hours worked in a year. A part-time or temporary job would constitute only a fraction of a job according to the model. For example, the IMPLAN model results show 305 new direct jobs during construction in Tazewell County, though the construction of the Project could involve closer to 610 workers working half-time for a year. Thus, due to the short-term nature of construction projects, IMPLAN often significantly understates the actual number of people, i.e. “boots on the ground,” hired to work on the project. Conversely, if the construction period lasts for two years, the job numbers from Table 5.1 would mean that the actual number of workers at any given time would be half of the reported number. It is important to keep this fact in mind when viewing or reporting the numbers.

As shown in Table 5.1, new local jobs created or retained during construction total 610 for Tazewell County and 1,313 for the State of Illinois. New local long-term jobs created from the Mackinaw Solar Project total 48.0 for Tazewell County and 72.3 for the State of Illinois.

Figure 5.1 – Total Employment Impacts from the Mackinaw Solar Project



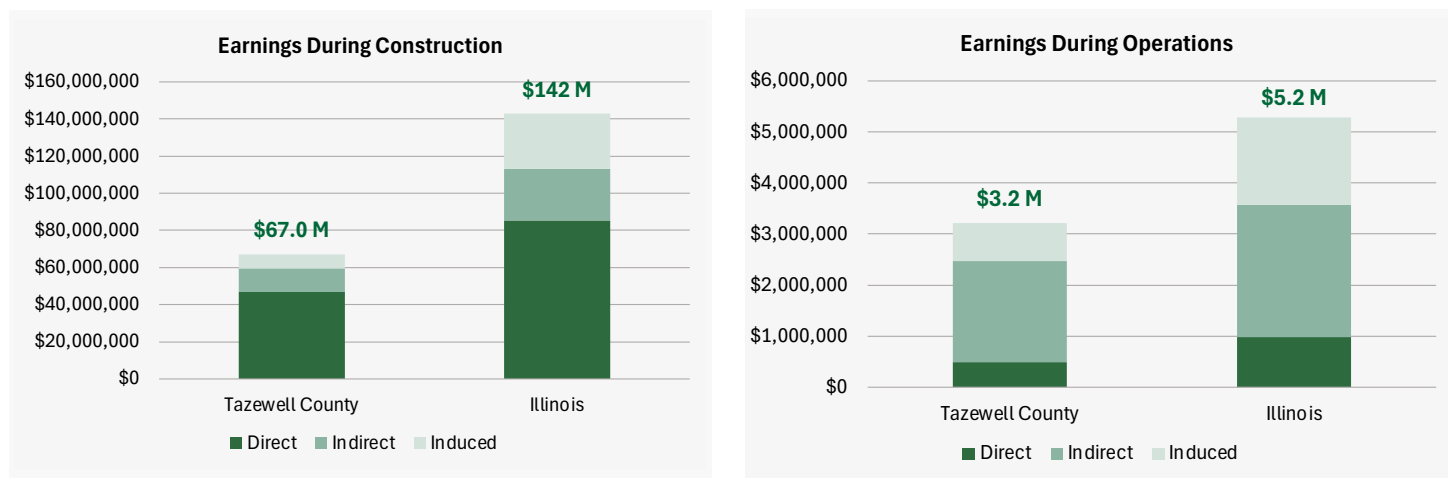
Direct jobs created during the operational phase last the life of the project, typically 20-30 years. Direct construction jobs and operations and maintenance jobs both require highly skilled workers in the fields of construction, management, and engineering. These well-paid professionals can boost economic development in communities that have experienced economic downturns. For a list of occupations expected to be employed, their wages, benefits, total compensation, and hours worked, please see Tables 7.3 to 7.5 in the Appendix.

Accordingly, it is important to look at both the number of jobs and the earnings they produce. Table 5.2 shows the earnings impacts from the Mackinaw Solar Project, which are categorized by construction impacts and annual operations impacts. The new local earnings during construction total over \$67.0 million for Tazewell County and over \$142 million for the State of Illinois. The new local long-term earnings total over \$3.2 million for Tazewell County and over \$5.2 million for the State of Illinois.

Table 5.2 – Total Earnings Impacts from the Mackinaw Solar Project

	Tazewell County	State of Illinois
Construction		
Project Development and On-site Labor Earnings Impacts	\$46,666,222	\$85,414,058
Supply Chain Impacts	\$12,923,174	\$27,667,523
Induced Impacts	\$7,463,406	\$29,882,681
<i>Local Earnings during Construction</i>	<i>\$67,052,802</i>	<i>\$142,964,262</i>
Operations (Annual/Ongoing)		
On-site Labor Earnings Impacts	\$494,153	\$988,306
Local Revenue and Supply Chain Impacts	\$1,982,173	\$2,579,896
Induced Impacts	\$739,904	\$1,715,567
<i>Local Long-Term Earnings</i>	<i>\$3,216,230</i>	<i>\$5,283,769</i>

Figure 5.2 – Total Earnings Impacts from the Mackinaw Solar Project



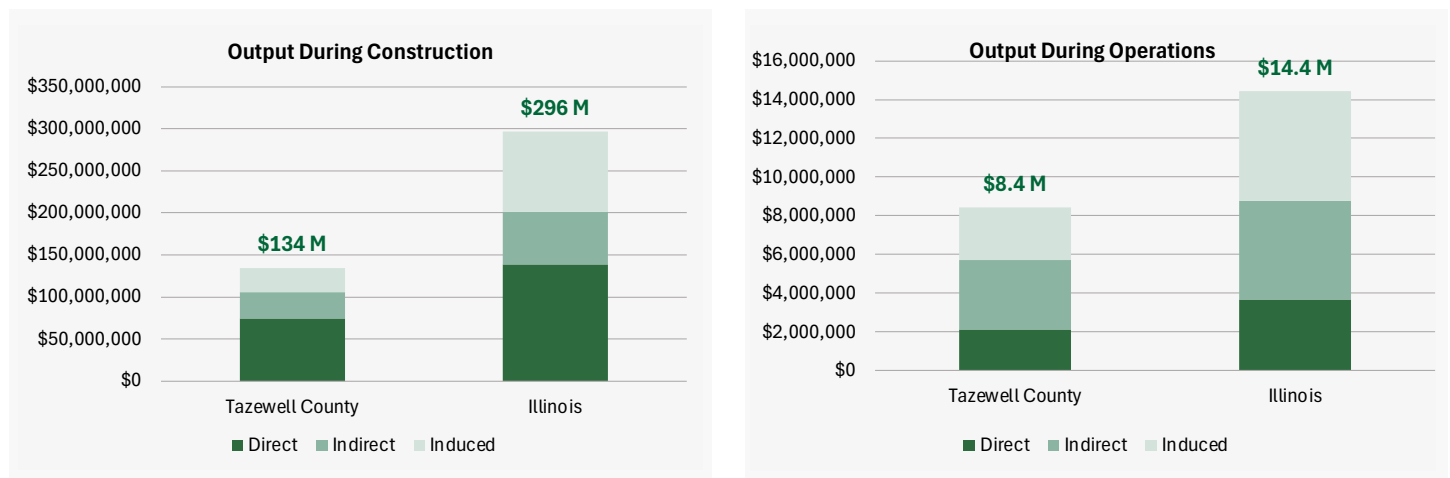
Output is akin to GDP and refers to economic activity or the value of production in the state or county economy. Economic output includes the earnings reported in Table 5.2 but also measures other factors, such as landowner payments, property taxes, and other economic activity that are neither earnings nor benefits from employment.

According to Table 5.3, the new local output during construction totals over \$134 million for Tazewell County and over \$296 million for the State of Illinois. The new local long-term output totals over \$8.4 million for Tazewell County and over \$14.4 million for the State of Illinois.

Table 5.3 – Total Output Impacts from the Mackinaw Solar Project

	Tazewell County	State of Illinois
Construction		
Project Development and On-site Labor Impacts on Output	\$74,210,906	\$138,516,436
Supply Chain Impacts	\$31,891,885	\$62,953,897
Induced Impacts	\$27,941,494	\$94,871,313
<i>Local Output during Construction</i>	<i>\$134,044,285</i>	<i>\$296,341,646</i>
Operations (Annual/Ongoing)		
On-site Labor Impacts on Output	\$2,099,754	\$3,665,703
Local Revenue and Supply Chain Impacts	\$3,590,756	\$5,083,999
Induced Impacts	\$2,749,151	\$5,678,107
<i>Local Long-Term Output</i>	<i>\$8,439,661</i>	<i>\$14,427,809</i>

Figure 5.3 – Total Output Impacts from the Mackinaw Solar Project



Solar projects increase a county's property tax base, creating a new revenue source for education and other local government services such as fire protection, park districts, and road maintenance. The fair cash value for solar property is set by statute according to its capacity and is annually adjusted for inflation and depreciation. In most cases, the inflation adjustment, also known as the Trending Factor, increases each year according to the Bureau of Labor Statistics' Consumer Price Index for all cities for all items. Depreciation is allowed at 4% per year up to a maximum total depreciation of 70% of the trended real property cost basis.

Tables 6.1 to 6.4 detail the tax implications of the Mackinaw Solar Project. Several important assumptions are built into the analysis, as follows:

- The capacity of the Project is 500 MWac, which is multiplied by \$218,000 to get the unindexed fair cash value.
- The assessment ratio is 33%.
- The trending factor is 1.47 in the first year of operations (2030) and increases by 2.4% annually. Depreciation is 4% annually until it reaches the maximum of 70%. No adjustments were made for obsolescence. The project life is 30 years.
- All tax rates stay constant at their 2026 (2025 Tax Year) rates. Assumed rates are 0.495% for Tazewell County, 0.21958% for Spring Lake Township, 0.17812% for Cincinnati Township, 0.45873% for Spring Lake Road & Bridge, 0.19013% for Cincinnati Road & Bridge, 0.45371% for Illinois Central Community College 514, 0.52313% for Forman Fire, 0.45035% for Cincinnati Fire, 0.18771% for Forman Valley Library, 0.10945% for Forman Park District, 0.01094% for Imperial Valley, 4.78734% for Midwest Central Community Unit School District (CUSD) 191, 3.72309% for Rankin School District 98, and 2.22144% for Pekin Community High School District 303. The names of the taxing bodies used in this section come from the county and state tax websites.
- The comprehensiveness and accuracy of the analysis below is dependent upon the assumptions listed above and used to calculate the local tax results. The analysis is to serve as a projection of local tax benefits to the community and is not a guarantee of local tax revenue.
- If the inputs received from Doral, the laws surrounding renewable energy taxation in Illinois, or the tax rates in Tazewell County change in a material way after the completion of this report, this analysis may no longer accurately reflect the local taxes to be paid by the Mackinaw Solar Project.
- No comprehensive tax payment was calculated, and these calculations are only to be used to illustrate the economic impact of the Project.



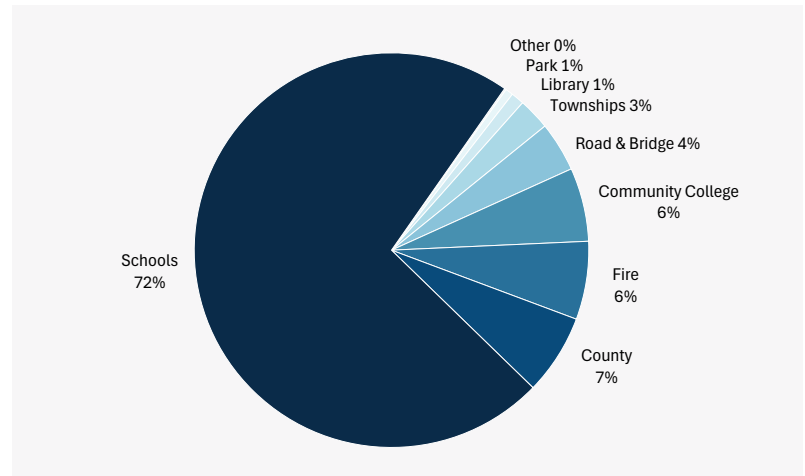
Table 6.1 – Total Local Taxes Paid by the Mackinaw Solar Project

Tax Year	Total Paid
2030	\$4,028,634
2031	\$3,960,308
2032	\$3,886,383
2033	\$3,806,627
2034	\$3,720,805
2035	\$3,628,671
2036	\$3,529,971
2037	\$3,424,444
2038	\$3,311,817
2039	\$3,191,813
2040	\$3,064,140
2041	\$2,928,501
2042	\$2,784,586
2043	\$2,632,076
2044	\$2,470,642
2045	\$2,299,944
2046	\$2,119,628
2047	\$1,929,332
2048	\$1,852,159
2049	\$1,896,611
2050	\$1,942,130
2051	\$1,988,741
2052	\$2,036,471
2053	\$2,085,346
2054	\$2,135,394
2055	\$2,186,644
2056	\$2,239,123
2057	\$2,292,862
2058	\$2,347,891
2059	\$2,404,240
TOTAL	\$82,125,935
AVG ANNUAL	\$2,737,531



As shown in Table 6.1, a conservative estimate of the total local taxes for the Project starts out at over \$4.0 million and declines due to depreciation until it reaches its minimum taxable value in 2048. Then, the trending factor causes taxes to increase over time. The expected total local taxes paid over the 30-year lifetime of the Project are over \$82.1 million, and the average annual local taxes paid are over \$2.7 million.

Figure 6.1 – Percentages of Local Taxes Paid to Taxing Jurisdictions





According to Table 6.2, the total amounts paid over 30 years are over \$5.4 million for Tazewell County, over \$1.0 million for Spring Lake Township, over \$1.1 million for Cincinnati Township, over \$2.1 million for Spring Lake Road & Bridge, over \$1.1 million for Cincinnati Road & Bridge, and over \$4.9 million for Illinois Central Community College 514.

Table 6.2 – Local Taxes from the Mackinaw Solar Project for the County & Other Taxing Bodies

Tax Year	Tazewell County	Spring Lake Township	Cincinnati Township	Spring Lake Road & Bridge	Cincinnati Road & Bridge	Illinois Central Community College 514
2030	\$265,279	\$50,677	\$54,349	\$105,870	\$58,014	\$243,151
2031	\$260,779	\$49,817	\$53,427	\$104,074	\$57,030	\$239,027
2032	\$255,912	\$48,887	\$52,430	\$102,132	\$55,965	\$234,565
2033	\$250,660	\$47,884	\$51,354	\$100,036	\$54,817	\$229,751
2034	\$245,009	\$46,805	\$50,196	\$97,780	\$53,581	\$224,571
2035	\$238,942	\$45,646	\$48,953	\$95,359	\$52,254	\$219,011
2036	\$232,443	\$44,404	\$47,622	\$92,765	\$50,833	\$213,054
2037	\$225,494	\$43,077	\$46,198	\$89,992	\$49,313	\$206,684
2038	\$218,077	\$41,660	\$44,679	\$87,033	\$47,691	\$199,887
2039	\$210,175	\$40,150	\$43,060	\$83,879	\$45,963	\$192,644
2040	\$201,768	\$38,544	\$41,337	\$80,524	\$44,125	\$184,938
2041	\$192,837	\$36,838	\$39,508	\$76,959	\$42,171	\$176,751
2042	\$183,360	\$35,028	\$37,566	\$73,177	\$40,099	\$168,065
2043	\$173,318	\$33,109	\$35,509	\$69,169	\$37,903	\$158,861
2044	\$162,688	\$31,079	\$33,331	\$64,927	\$35,578	\$149,117
2045	\$151,447	\$28,931	\$31,028	\$60,441	\$33,120	\$138,814
2046	\$139,574	\$26,663	\$28,595	\$55,703	\$30,523	\$127,931
2047	\$127,043	\$24,269	\$26,028	\$50,702	\$27,783	\$116,446
2048	\$121,961	\$23,299	\$24,987	\$48,674	\$26,672	\$111,788
2049	\$124,889	\$23,858	\$25,587	\$49,842	\$27,312	\$114,471
2050	\$127,886	\$24,430	\$26,201	\$51,038	\$27,967	\$117,218
2051	\$130,955	\$25,017	\$26,830	\$52,263	\$28,639	\$120,032
2052	\$134,098	\$25,617	\$27,473	\$53,517	\$29,326	\$122,912
2053	\$137,316	\$26,232	\$28,133	\$54,802	\$30,030	\$125,862
2054	\$140,612	\$26,861	\$28,808	\$56,117	\$30,750	\$128,883
2055	\$143,987	\$27,506	\$29,499	\$57,464	\$31,488	\$131,976
2056	\$147,442	\$28,166	\$30,207	\$58,843	\$32,244	\$135,144
2057	\$150,981	\$28,842	\$30,932	\$60,255	\$33,018	\$138,387
2058	\$154,605	\$29,534	\$31,675	\$61,701	\$33,810	\$141,708
2059	\$158,315	\$30,243	\$32,435	\$63,182	\$34,622	\$145,109
TOTAL	\$5,407,851	\$1,033,073	\$1,107,939	\$2,158,219	\$1,182,643	\$4,956,760
AVG ANNUAL	\$180,262	\$34,436	\$36,931	\$71,941	\$39,421	\$165,225



According to Table 6.3, the total amounts paid over 30 years are over \$2.4 million for Forman Fire, over \$2.8 million for Cincinnati Fire, over \$883 thousand for Forman Valley Library, over \$514 thousand for the Forman Park District, and over \$119 thousand for Imperial Valley.

Table 6.3 – Local Taxes from the Mackinaw Solar Project for Other Taxing Bodies

Tax Year	Forman Fire	Cincinnati Fire	Forman Valley Library	Forman Park District	Imperial Valley
2030	\$120,733	\$137,414	\$43,321	\$25,260	\$5,863
2031	\$118,685	\$135,083	\$42,587	\$24,831	\$5,763
2032	\$116,470	\$132,562	\$41,792	\$24,368	\$5,656
2033	\$114,080	\$129,841	\$40,934	\$23,868	\$5,540
2034	\$111,508	\$126,914	\$40,011	\$23,330	\$5,415
2035	\$108,746	\$123,771	\$39,021	\$22,752	\$5,281
2036	\$105,789	\$120,405	\$37,959	\$22,133	\$5,137
2037	\$102,626	\$116,805	\$36,824	\$21,472	\$4,984
2038	\$99,251	\$112,964	\$35,613	\$20,765	\$4,820
2039	\$95,654	\$108,871	\$34,323	\$20,013	\$4,645
2040	\$91,828	\$104,516	\$32,950	\$19,212	\$4,459
2041	\$87,763	\$99,889	\$31,491	\$18,362	\$4,262
2042	\$83,450	\$94,980	\$29,944	\$17,460	\$4,052
2043	\$78,880	\$89,778	\$28,304	\$16,503	\$3,830
2044	\$74,042	\$84,272	\$26,568	\$15,491	\$3,596
2045	\$68,926	\$78,450	\$24,732	\$14,421	\$3,347
2046	\$63,522	\$72,299	\$22,793	\$13,290	\$3,085
2047	\$57,820	\$65,808	\$20,747	\$12,097	\$2,808
2048	\$55,507	\$63,176	\$19,917	\$11,613	\$2,695
2049	\$56,839	\$64,692	\$20,395	\$11,892	\$2,760
2050	\$58,203	\$66,245	\$20,884	\$12,177	\$2,826
2051	\$59,600	\$67,835	\$21,386	\$12,470	\$2,894
2052	\$61,030	\$69,463	\$21,899	\$12,769	\$2,964
2053	\$62,495	\$71,130	\$22,425	\$13,075	\$3,035
2054	\$63,995	\$72,837	\$22,963	\$13,389	\$3,108
2055	\$65,531	\$74,585	\$23,514	\$13,710	\$3,182
2056	\$67,104	\$76,375	\$24,078	\$14,040	\$3,259
2057	\$68,714	\$78,208	\$24,656	\$14,376	\$3,337
2058	\$70,363	\$80,085	\$25,248	\$14,721	\$3,417
2059	\$72,052	\$82,007	\$25,854	\$15,075	\$3,499
TOTAL	\$2,461,206	\$2,801,259	\$883,132	\$514,937	\$119,519
AVG ANNUAL	\$82,040	\$93,375	\$29,438	\$17,165	\$3,984

Table 6.4 – Local Taxes from the Mackinaw Solar Project for the School District

Tax Year	Midwest Central CUSD 191	Rankin School District 98	Pekin Community High School District 303
2030	\$1,104,867	\$1,136,015	\$677,821
2031	\$1,086,129	\$1,116,749	\$666,326
2032	\$1,065,854	\$1,095,903	\$653,887
2033	\$1,043,981	\$1,073,413	\$640,469
2034	\$1,020,444	\$1,049,212	\$626,029
2035	\$995,176	\$1,023,232	\$610,527
2036	\$968,107	\$995,400	\$593,921
2037	\$939,166	\$965,643	\$576,166
2038	\$908,278	\$933,884	\$557,216
2039	\$875,366	\$900,044	\$537,025
2040	\$840,351	\$864,042	\$515,544
2041	\$803,152	\$825,794	\$492,723
2042	\$763,683	\$785,212	\$468,509
2043	\$721,856	\$742,207	\$442,849
2044	\$677,582	\$696,685	\$415,688
2045	\$630,768	\$648,550	\$386,968
2046	\$581,316	\$597,704	\$356,629
2047	\$529,126	\$544,043	\$324,612
2048	\$507,961	\$522,282	\$311,627
2049	\$520,152	\$534,816	\$319,107
2050	\$532,636	\$547,652	\$326,765
2051	\$545,419	\$560,796	\$334,607
2052	\$558,509	\$574,255	\$342,638
2053	\$571,914	\$588,037	\$350,861
2054	\$585,639	\$602,150	\$359,282
2055	\$599,695	\$616,601	\$367,905
2056	\$614,087	\$631,400	\$376,734
2057	\$628,826	\$646,553	\$385,776
2058	\$643,917	\$662,071	\$395,035
2059	\$659,371	\$677,960	\$404,516
TOTAL	\$22,523,330	\$23,158,302	\$13,817,764
AVG ANNUAL	\$750,778	\$771,943	\$460,592



The largest taxing jurisdictions for local taxes are local school districts. However, the tax implications for school districts are more complicated than for other taxing bodies. School districts receive state aid based on the assessed value of the taxable property within their district. As assessed value increases, the state aid to the school district is decreased.

Although the exact amount of the reduction in state aid to the school districts is uncertain, local project tax revenue is superior to relying on state aid for the following reasons: (1) a solar project can't relocate – it is a permanent structure that will be within the school district's footprint for the life of the Project; (2) the school district can raise the tax rate and increase its revenues as needed; (3) the school district does not have to deal with the year-to-year uncertainty of state aid amounts; (4) the school district does not have to wait for months (or even into the next Fiscal Year) for payment; (5) the Project does not increase the overall cost of education in the way that a new residential development would.

Table 6.4 shows the direct local tax revenue coming from the Project to Midwest Central CUSD 191, Rankin School District 98, and Pekin Community High School District 303. This tax revenue uses the assumptions outlined earlier to calculate the other tax revenue and assumes that 43% of the Project area is in Midwest Central CUSD 191, 57% of the Project area is in Rankin School District 98, and 57% of the Project area is in Pekin Community High School District 303. Over the 30-year life of the Project, the school districts are expected to receive over \$59.4 million in tax revenue.

Having considered all these benefits, it is still important to determine the net impact of the solar energy project after taking into account the reduction in school funding from the State of Illinois. Determining the reduction in state aid is complicated by the fact that there is a new law for distributing state funds to education.

On August 31, 2017, Governor Rauner signed into law PA 100-0465 that fundamentally changes the way that the state distributes state aid to school districts. The “Evidence Based Funding” (EBF) consists of two parts – a Base Funding Minimum and a Tier Funding. The Base Funding Minimum is based on what the district received in the previous fiscal year. Some call this the “Hold Harmless” provision and ensures that there are no “losing” districts in the transition to the new funding formula. The Tier Funding is additional money that is distributed in higher portion to the districts that demonstrate a higher need under the new formula. Because of the “Hold Harmless” provision, no school district will see a reduction in their GSA from what they received in the year before the solar farm was installed. However, the higher EAV caused by the solar farm could reduce its eligibility for new money allocated in the state budget.

There are several sources of uncertainty with the new school funding formula concerning this new money. First, the total amount of new funding to be distributed over the ten years from the passage of the law is unknown at this point. It will be determined year-by-year in the state budget passed by the legislature and signed by the governor. For FY21, no new money was allocated for the school funding formula in the state budget. For FY22-26, new money was restored in the state budget. Second, data for the formula funding changes each year based on the school’s student population and its “need” and it is difficult to forecast its school’s student population over time. Third, each school district is competing with all other school districts for this new funding and so the EAV and student population for all other school districts in the state will impact what a single school district receives. Fourth, the school district’s EAV could also change due to other property changes in the district.

For Fiscal Year 2026, Midwest Central CUSD 191 had 80% adequacy, was assigned Tier 2 status, and will receive \$53,164 in “new money”; Rankin School District 98 had 127% adequacy, was assigned Tier 4 status, and will receive \$158 in “new money”; and Pekin Community High School District 303 had 70% adequacy, was assigned Tier 1 status, and will receive \$690,358 in “new money”. As outlined in Table 6.4, there is no year in which Midwest Central CUSD 191 receives less than \$507,961, Rankin School District 98 receives less than \$522,282, and Pekin Community High School District 303 receives less than \$311,627. If new money is allocated in the future, it is unlikely that the districts will lose all of the “new money” and their EBF funding cannot go down from the previous year. Thus, the school districts will receive a net positive flow of funds because of the Project if “new money” remains the same.



Table 7.1 – Local and Statewide Compensation by Occupation

Occupation Code	Job Type	Education/ Training Required	Illinois 10 th Percentile of Wages	Illinois 90 th Percentile of Wages	Illinois Mean Wages	Peoria, IL 10 th Percentile of Wages	Peoria, IL 90 th Percentile of Wages	Peoria, IL Mean Wages	U.S. Fringe Benefits Median	Total Compensation Local Mean Wages plus U.S. Fringe
Jobs During Construction										
47-2231	Solar Photovoltaic Installers	High school diploma or equivalent	\$36,030	\$74,190	\$46,860	#N/A	#N/A	#N/A	\$27,394	#N/A
47-3013	Helpers – Electricians	High school diploma or equivalent	\$24,960	\$59,170	\$39,820	\$24,960	\$59,220	\$38,400	\$27,394	\$65,794
47-2111	Electricians	High school diploma or equivalent	\$46,950	\$116,340	\$84,790	\$41,310	\$98,770	\$72,870	\$27,394	\$100,264
47-2061	Construction Laborers	No formal educational credential	\$36,250	\$100,000	\$65,590	\$31,370	\$90,810	\$59,150	\$27,394	\$86,544
47-2073	Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	\$44,860	\$112,220	\$82,280	\$40,700	\$103,830	\$78,430	\$27,394	\$105,824
47-1011	First-Line Supervisors of Construction Trades	High school diploma or equivalent	\$49,790	\$123,870	\$89,470	\$51,070	\$112,640	\$83,640	\$27,394	\$111,034
13-1082	Project Management Specialists and Business Operations Specialists		\$52,840	\$154,070	\$99,210	\$52,050	\$133,830	\$91,790	\$27,394	\$119,184
49-9071	Maintenance and Repair Workers, General (Operations)	High school diploma or equivalent	\$30,210	\$77,900	\$52,160	\$29,260	\$76,160	\$49,990	\$27,394	\$77,384
13-1111	Management Analysts	Bachelor's degree	\$62,050	\$176,900	\$116,650	\$55,150	\$155,400	\$105,340	\$27,394	\$132,734
11-1021	General and Operations Managers	Bachelor's degree	\$42,200	\$228,630	\$124,510	\$42,420	\$200,470	\$106,250	\$27,394	\$133,644
17-2071	Electrical Engineers		\$64,910	\$138,360	\$101,210	\$63,460	\$131,800	\$91,120	\$27,394	\$118,514
41-3091	Sales Representatives of Services		\$36,600	\$126,290	\$74,130	\$30,420	\$107,190	\$64,060	\$27,394	\$91,454
53-7062	Laborers and Freight, Stock and Material Movers	No formal educational credential	\$27,970	\$49,350	\$37,710	\$27,150	\$46,660	\$35,670	\$27,394	\$63,064
43-3031	Bookkeeping, Accounting and Auditing	Some college, no degree	\$31,570	\$72,800	\$49,810	\$28,850	\$60,200	\$44,440	\$27,394	\$71,834
Jobs during Operations										
51-8013	Power Plant Operators	High school diploma or equivalent	\$59,080	\$123,480	\$93,800	#N/A	#N/A	#N/A	\$27,394	#N/A
37-3011	Landscaping and Groundskeeping	No formal educational credential	\$28,290	\$49,810	\$38,940	\$24,960	\$56,780	\$37,790	\$27,394	\$65,184
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	\$40,680	\$96,900	\$67,080	\$43,130	\$94,840	\$66,180	\$27,394	\$93,574

Source: U.S. Bureau of Labor Statistics (2024), Occupational Employment and Wage Statistics (OEWS) Tables

Table 7.2 – Occupational Description and Future Outlook

Occupation Code	Occupation Title	Description	Work Environment	Current Employment	Job Growth, 2024-2034 (percent)
11-1021	General and Operations Managers	Plan, direct, or coordinate the operations of public or private sector organizations, overseeing multiple departments or locations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but they are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services. Usually manage through subordinate supervisors. Excludes First-Line Supervisors.	Top executives work in nearly every industry, for both small and large organizations. They often have irregular schedules, which may include working evenings and weekends. Travel is common, particularly for chief executives.	3,584,420	164,000 (4.4%)
13-1082	Project Management Specialists and Business Operations Specialists	Analyze and coordinate the schedule, timeline, procurement, staffing, and budget of a product or service on a per project basis. Lead and guide the work of technical staff. May serve as a point of contact for the client or customer. Excludes "Management Occupations" (11-0000), "Logisticians" (13-1081), "Meeting, Convention, and Event Planners" (13-1121), and "Production, Planning, and Expediting Clerks" (43-5061).	Project management specialists usually work in an office setting. Although project management specialists may collaborate on teams, some work independently. Project management specialists also may travel to their clients' places of business.	1,006,160	58,700 (5.6%)
13-1111	Management Analysts	Conduct organizational studies and evaluations, design systems and procedures, conduct work simplification and measurement studies, and prepare operations and procedures manuals to assist management in operating more efficiently and effectively. Includes program analysts and management consultants. Excludes "Computer Systems Analysts" (15-1211) and "Operations Research Analysts" (15-2031).	Management analysts may travel frequently to meet with clients. Some work more than 40 hours per week.	893,900	94,500 (8.8%)
17-2071	Electrical Engineers	Research, design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use. Excludes "Computer Hardware Engineers" (17-2061).	Electrical and electronics engineers work in industries including research and development, engineering services, manufacturing, telecommunications, and the federal government. Electrical and electronics engineers generally work indoors in offices. However, they may have to visit sites to observe a problem or a piece of complex equipment.	188,790	13,800 (7.2%)
37-3011	Landscaping and Groundskeeping	Landscape or maintain grounds of property using hand or power tools or equipment. Workers typically perform a variety of tasks, which may include any combination of the following: sod laying, mowing, trimming, planting, watering, fertilizing, digging, raking, sprinkler installation, and installation of mortarless segmental concrete masonry wall units. Excludes "Farmworkers and Laborers, Crop, Nursery, and Greenhouse" (45-2092).	Most grounds maintenance work is done outdoors in all weather conditions. Some work is seasonal, available mainly in the spring, summer, and fall. The work may be repetitive and physically demanding, requiring frequent bending, kneeling, lifting, or shoveling.	943,430	42,400 (3.6%)
41-3091	Sales Representatives of Services	Sell services to individuals or businesses. May describe options or resolve client problems. Excludes "Advertising Sales Agents" (41-3011), "Insurance Sales Agents" (41-3021), "Securities, Commodities, and Financial Services Sales Agents" (41-3031), "Travel Agents" (41-3041), "Sales Representatives, Wholesale and Manufacturing" (41-4010), and "Telemarketers" (41-9041).	Wholesale and manufacturing sales representatives work under pressure because their income and job security depend on the amount of merchandise they sell. Some sales representatives travel frequently.	1,189,330	37,900 (3.1%)
43-3031	Bookkeeping, Accounting and Auditing	Compute, classify, and record numerical data to keep financial records complete. Perform any combination of routine calculating, posting, and verifying duties to obtain primary financial data for use in maintaining accounting records. May also check the accuracy of figures, calculations, and postings pertaining to business transactions recorded by other workers. Excludes "Payroll and Timekeeping Clerks" (43-3051).	Most accountants and auditors work full-time. Overtime hours are typical at certain periods of the year, such as for quarterly audits or during tax season.	1,455,770	-94,300 (-5.8%)
47-1011	First-Line Supervisors of Construction Trades	Directly supervise and coordinate activities of construction or extraction workers.	Construction managers may have a main office but spend most of their time in a field office onsite, where they monitor projects and make decisions about construction activities. Those who manage multiple projects must visit the different worksites, which may require travelling out of state or being away from home for extended periods.	806,080	49,000 (5.3%)

Sources: U.S. Bureau of Labor Statistics, OEWS (2024); Employment Projections, Occupational Projections Data [Data set] (2024); Occupational Outlook Handbook (OOH) (2025)

Table 7.2 – Occupational Description and Future Outlook (Cont.)

Occupation Code	Occupation Title	Description	Work Environment	Current Employment	Job Growth, 2024-2034 (percent)[S]
47-2061	Construction Laborers	Perform tasks involving physical labor at construction sites. May operate hand and power tools of all types: air hammers, earth tampers, cement mixers, small mechanical hoists, surveying and measuring equipment, and a variety of other equipment and instruments. May clean and prepare sites, dig trenches, set braces to support the sides of excavations, erect scaffolding, and clean up rubble, debris, and other waste materials. May assist other craft workers. Construction laborers who primarily assist a particular craft worker are classified under “Helpers, Construction Trades” (47-3010). Excludes “Hazardous Materials Removal Workers” (47-4041).	Most construction laborers and helpers typically work full-time and do physically demanding work. Some work at great heights or outdoors in all weather conditions. Construction laborers have one of the highest rates of injuries and illnesses of all occupations.	1,057,660	106,500 (7.3%)
47-2073	Operating Engineers and Other Construction Equipment Operators	Operate one or several types of power construction equipment, such as motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete or other hard surface pavement. May repair and maintain equipment in addition to other duties. Excludes “Extraction Workers” (47-5000) and “Crane and Tower Operators” (53-7021).	Construction equipment operators may work even in unpleasant weather. Most operators work full-time, and some have irregular work schedules that include nights.	469,270	17,800 (3.6%)
47-2111	Electricians	Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems. Excludes “Security and Fire Alarm Systems Installers” (49-2098).	Almost all electricians work full-time. Work schedules may include evenings and weekends. Overtime is common.	742,580	77,400 (9.5%)
47-2231	Solar Photovoltaic Installers	Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics. May include measuring, cutting, assembling, and bolting structural framing and solar modules. May perform minor electrical work such as current checks. Excludes solar PV electricians who are included in “Electricians” (47-2111) and solar thermal installers who are included in “Plumbers, Pipefitters, and Steamfitters” (47-2152).	Most solar panel installations are done outdoors, but PV installers sometimes work in attics and crawl spaces to connect panels to the electrical grid. Installers also must travel to jobsites.	28,280	12,000 (42.1%)
47-3013	Helpers – Electricians	Help electricians by performing duties requiring less skill. Duties include using, supplying, or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist electricians are classified under “Construction Laborers” (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).	Most construction laborers and helpers typically work full-time and do physically demanding work. Some work at great heights or outdoors in all weather conditions. Construction laborers have one of the highest rates of injuries and illnesses of all occupations.	64,440	100 (0.2%)
49-9071	Maintenance and Repair Workers, General (Operations)	Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of a building in repair. Duties may involve pipe fitting; HVAC maintenance; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs. Excludes “Facilities Managers” (11-3013) and “Maintenance Workers, Machinery” (49-9043).	General maintenance and repair workers often carry out many different tasks in a single day. They could work at any number of indoor or outdoor locations. They may work inside a single building, such as a hotel or hospital, or be responsible for the maintenance of many buildings, such as those in an apartment complex or on a college campus.	1,531,700	62,400 (3.8%)
51-1011	First-Line Supervisors of Production and Operating Workers	Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators. Excludes team or work leaders.	N/A	685,140	8,300 (1.2%)
51-8013	Power Plant Operators	Control, operate, or maintain machinery to generate electric power. Includes auxiliary equipment operators. Excludes “Nuclear Power Reactor Operators” (51-8011).	Most power plant operators, distributors, and dispatchers work full-time. Many work rotating 8- or 12-hour shifts.	30,720	-3,500 (-11.2%)
53-7062	Laborers and Freight, Stock, and Material Movers	Manually move freight, stock, luggage, or other materials, or perform other general labor. Includes all manual laborers not elsewhere classified. Excludes “Construction Laborers” (47-2061) and “Helpers, Construction Trades” (47-3011 through 47-3019). Excludes “Material Moving Workers” (53-7011 through 53-7199) who use power equipment.	Most hand laborers and material movers work full-time. Because materials are shipped around the clock, some workers, especially those in warehousing, work overnight shifts.	2,982,530	44,300 (1.5%)

Table 7.3 – Occupational Output from IMPLAN Construction Model, Direct Jobs, Employment Greater than 1.0

This table is directly modeled for this project.

Occupation Code	Occupation	Wage and Salary Employment	Wage and Salary Income	Supplements to Wages and Salaries	Employee Compensation	Hours Worked
47-2000	Construction Trades Workers	89.02	\$9,138,764.48	\$1,576,351.68	\$10,715,116.16	169,523.79
49-9000	Other Installation, Maintenance, and Repair Occupations	75.13	\$9,192,687.46	\$1,585,652.89	\$10,778,340.35	157,312.91
47-1000	Supervisors of Construction and Extraction Workers	23.78	\$3,663,172.35	\$631,863.08	\$4,295,035.43	50,555.74
49-1000	Supervisors of Installation, Maintenance, and Repair Workers	17.26	\$2,811,281.35	\$484,919.83	\$3,296,201.17	37,532.67
13-1000	Business Operations Specialists	14.18	\$2,192,873.64	\$378,250.26	\$2,571,123.91	28,459.87
11-9000	Other Management Occupations	11.48	\$2,419,224.32	\$417,293.64	\$2,836,517.96	24,646.87
11-1000	Top Executives	8.91	\$2,446,055.42	\$421,921.76	\$2,867,977.18	19,705.10
43-9000	Other Office and Administrative Support Workers	5.80	\$450,691.61	\$77,740.10	\$528,431.72	9,305.78
43-3000	Financial Clerks	4.88	\$463,873.79	\$80,013.90	\$543,887.69	8,650.02
43-6000	Secretaries and Administrative Assistants	4.59	\$409,325.94	\$70,604.91	\$479,930.85	7,982.43
53-3000	Motor Vehicle Operators	4.42	\$438,042.15	\$75,558.19	\$513,600.34	8,966.29
49-2000	Electrical and Electronic Equipment Mechanics, Installers, and Repairers	4.30	\$517,743.50	\$89,305.93	\$607,049.42	8,980.27
49-3000	Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	4.08	\$475,554.48	\$82,028.71	\$557,583.19	8,502.36
17-2000	Engineers	3.73	\$668,091.86	\$115,239.62	\$783,331.48	7,512.10
53-7000	Material Moving Workers	3.68	\$307,331.74	\$53,011.86	\$360,343.60	6,294.09
11-3000	Operations Specialties Managers	2.70	\$645,001.49	\$111,256.74	\$756,258.23	5,619.96
13-2000	Financial Specialists	2.65	\$447,016.80	\$77,106.23	\$524,123.03	5,243.23
17-3000	Drafters, Engineering Technicians, and Mapping Technicians	2.46	\$265,176.19	\$45,740.42	\$310,916.61	4,735.05
19-5000	Occupational Health and Safety Specialists and Technicians	2.30	\$343,908.06	\$59,320.93	\$403,229.00	4,584.45
47-4000	Other Construction and Related Workers	2.29	\$301,351.32	\$51,980.29	\$353,331.61	4,461.01
15-1200	Computer Occupations	2.15	\$315,059.16	\$54,344.77	\$369,403.93	4,268.85
51-4000	Metal Workers and Plastic Workers	2.09	\$261,752.64	\$45,149.89	\$306,902.53	4,159.56
43-5000	Material Recording, Scheduling, Dispatching, and Distributing Workers	1.92	\$203,409.18	\$35,086.19	\$238,495.36	3,700.52
43-1000	Supervisors of Office and Administrative Support Workers	1.85	\$238,787.35	\$41,188.59	\$279,975.94	3,615.99
47-5000	Extraction Workers	1.67	\$173,458.32	\$29,919.94	\$203,378.26	3,648.08
47-3000	Helpers, Construction Trades	1.18	\$95,013.57	\$16,388.95	\$111,402.52	1,898.35
41-3000	Sales Representatives, Services	1.12	\$168,293.68	\$29,029.09	\$197,322.77	2,217.89

Table 7.4 – Occupational Output from IMPLAN Construction Model, Indirect Jobs, Employment Greater than 1.0

This table is directly modeled for this project.

Occupation Code	Occupation	Wage and Salary Employment	Wage and Salary Income	Supplements to Wages and Salaries	Employee Compensation	Hours Worked
47-2000	Construction Trades Workers	33.64	\$2,201,667.93	\$380,192.14	\$2,581,860.07	63,766.51
41-2000	Retail Sales Workers	9.45	\$305,183.68	\$64,500.91	\$369,684.60	13,906.33
47-1000	Supervisors of Construction and Extraction Workers	9.44	\$834,034.20	\$143,966.13	\$978,000.33	20,304.81
13-1000	Business Operations Specialists	9.31	\$923,404.40	\$159,509.04	\$1,082,913.44	18,850.12
49-3000	Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	8.26	\$377,709.56	\$77,303.31	\$455,012.86	14,609.95
11-9000	Other Management Occupations	7.59	\$953,772.67	\$164,550.28	\$1,118,322.95	16,474.89
53-3000	Motor Vehicle Operators	5.71	\$270,742.57	\$53,909.14	\$324,651.71	10,952.38
11-1000	Top Executives	4.43	\$659,458.97	\$118,310.36	\$777,769.33	9,641.81
53-7000	Material Moving Workers	3.84	\$164,373.62	\$30,079.83	\$194,453.46	6,114.66
43-9000	Other Office and Administrative Support Workers	3.08	\$130,928.14	\$23,576.69	\$154,504.83	4,873.39
17-2000	Engineers	3.02	\$287,587.82	\$48,506.50	\$336,094.32	6,169.62
43-3000	Financial Clerks	2.35	\$119,332.39	\$21,587.86	\$140,920.26	4,028.46
49-9000	Other Installation, Maintenance, and Repair Occupations	2.05	\$124,346.75	\$21,893.82	\$146,240.57	4,070.10
43-6000	Secretaries and Administrative Assistants	1.96	\$103,984.86	\$18,273.53	\$122,258.39	3,426.35
43-4000	Information and Record Clerks	1.96	\$73,665.71	\$14,310.91	\$87,976.62	3,035.54
13-2000	Financial Specialists	1.92	\$172,129.84	\$30,917.43	\$203,047.26	3,756.40
41-1000	Supervisors of Sales Workers	1.46	\$89,531.07	\$18,641.96	\$108,173.03	2,678.50
11-3000	Operations Specialties Managers	1.42	\$212,889.88	\$38,146.70	\$251,036.58	2,937.48
43-5000	Material Recording, Scheduling, Dispatching, and Distributing Workers	1.19	\$64,870.69	\$15,010.38	\$79,881.07	2,196.28
49-1000	Supervisors of Installation, Maintenance, and Repair Workers	1.17	\$81,623.22	\$16,233.87	\$97,857.09	2,351.18
11-2000	Advertising, Marketing, Promotions, Public Relations, and Sales Managers	1.03	\$138,218.02	\$26,774.68	\$164,992.71	2,077.85
41-3000	Sales Representatives, Services	1.03	\$79,196.14	\$14,518.96	\$93,715.10	1,984.35

Table 7.5 – Occupational Output from IMPLAN Construction Model, Induced Jobs, Employment Greater than 1.0

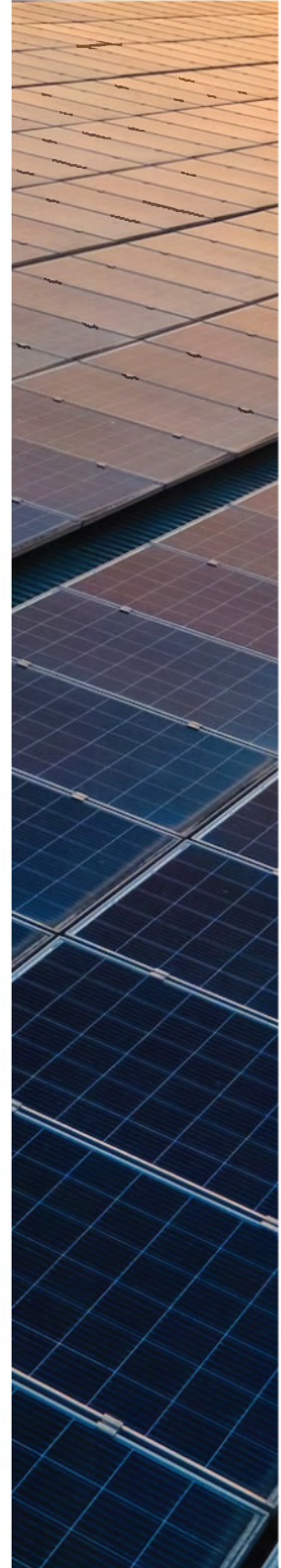
This table is directly modeled for this project.

Occupation Code	Occupation	Wage and Salary Employment	Wage and Salary Income	Supplements to Wages and Salaries	Employee Compensation	Hours Worked
35-3000	Food and Beverage Serving Workers	14.82	\$321,115.83	\$44,366.39	\$365,482.22	16,025.77
41-2000	Retail Sales Workers	12.23	\$360,945.26	\$77,380.17	\$438,325.43	16,286.69
35-2000	Cooks and Food Preparation Workers	6.89	\$176,973.87	\$25,442.98	\$202,416.85	9,332.74
31-1100	Home Health and Personal Care Aides; and Nursing Assistants, Orderlies, and Psychiatric Aides	6.28	\$166,706.87	\$34,002.20	\$200,709.07	9,905.91
53-7000	Material Moving Workers	4.69	\$212,408.17	\$40,815.27	\$253,223.44	7,329.58
29-1000	Healthcare Diagnosing or Treating Practitioners	4.57	\$465,589.18	\$92,504.47	\$558,093.65	8,236.13
13-1000	Business Operations Specialists	3.80	\$261,508.44	\$45,473.56	\$306,981.99	7,299.20
43-4000	Information and Record Clerks	3.67	\$134,687.08	\$25,060.24	\$159,747.32	5,969.19
11-1000	Top Executives	3.36	\$343,179.59	\$60,908.54	\$404,088.13	7,174.21
53-3000	Motor Vehicle Operators	3.26	\$164,569.96	\$33,825.04	\$198,395.00	6,263.11
49-3000	Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	2.95	\$180,300.82	\$31,823.37	\$212,124.19	5,750.44
35-9000	Other Food Preparation and Serving Related Workers	2.90	\$55,406.92	\$7,595.40	\$63,002.32	2,852.06
35-1000	Supervisors of Food Preparation and Serving Workers	2.82	\$118,564.79	\$16,562.68	\$135,127.47	4,703.38
29-2000	Health Technologists and Technicians	2.61	\$114,901.98	\$23,505.48	\$138,407.46	4,554.25
43-6000	Secretaries and Administrative Assistants	2.33	\$81,465.82	\$14,647.44	\$96,113.27	4,108.68
37-2000	Building Cleaning and Pest Control Workers	2.28	\$64,498.14	\$11,493.76	\$75,991.90	3,605.52
43-9000	Other Office and Administrative Support Workers	2.14	\$72,709.18	\$12,963.20	\$85,672.37	3,469.97
39-9000	Other Personal Care and Service Workers	2.11	\$39,133.05	\$7,066.05	\$46,199.09	2,432.43
11-9000	Other Management Occupations	2.07	\$171,875.53	\$30,360.11	\$202,235.64	4,108.23
13-2000	Financial Specialists	2.01	\$162,439.70	\$27,585.19	\$190,024.89	4,029.43

Table 7.5 – Occupational Output from IMPLAN Construction Model, Induced Jobs, Employment Greater than 1.0 (Cont.)

This table is directly modeled for this project.

Occupation Code	Occupation	Wage and Salary Employment	Wage and Salary Income	Supplements to Wages and Salaries	Employee Compensation	Hours Worked
41-1000	Supervisors of Sales Workers	1.90	\$107,206.22	\$23,224.48	\$130,430.70	3,675.33
21-2000	Religious Workers	1.82	\$31,065.47	\$4,500.69	\$35,566.15	3,608.03
15-1200	Computer Occupations	1.72	\$159,114.50	\$26,409.66	\$185,524.17	3,390.20
21-1000	Counselors, Social Workers, and Other Community and Social Service Specialists	1.70	\$68,291.31	\$13,174.91	\$81,466.23	2,987.64
43-3000	Financial Clerks	1.68	\$72,543.03	\$13,136.05	\$85,679.07	2,950.62
49-9000	Other Installation, Maintenance, and Repair Occupations	1.66	\$85,516.37	\$16,284.28	\$101,800.64	3,247.51
31-9000	Other Healthcare Support Occupations	1.57	\$54,321.85	\$10,360.64	\$64,682.49	2,535.92
25-2000	Preschool, Elementary, Middle, Secondary, and Special Education Teachers	1.46	\$39,055.25	\$7,273.43	\$46,328.68	2,533.36
41-3000	Sales Representatives, Services	1.38	\$90,375.51	\$15,744.74	\$106,120.25	2,734.70
11-3000	Operations Specialties Managers	1.31	\$184,512.31	\$32,092.35	\$216,604.66	2,734.38
43-5000	Material Recording, Scheduling, Dispatching, and Distributing Workers	1.29	\$69,209.08	\$22,556.96	\$91,766.04	2,418.78



Bb**Battery Energy Storage Systems (BESS)**

An array of hundreds or thousands of small batteries that enable energy from renewables, like solar and wind, to be stored and released at a later time.

Cc**Consumer Price Index (CPI)**

An index of the changes in the cost of goods and services to a typical consumer, based on the costs of the same goods and services at a base period.

Dd**Direct impacts**

During the construction period: the changes that occur in the on-site construction industries in which the direct final demand change is made.

During operating years: the final demand changes that occur in the on-site spending for the solar operations and maintenance workers.

Ee**Equalized Assessed Value (EAV)**

The product of the assessed value of property and the state equalization factor. This is typically used as the basis for the value of property in a property tax calculation.

Ff**Full-time equivalent (FTE)**

A unit that indicates the workload of an employed person. One FTE is equivalent to one worker working 2,080 hours in a year. One half FTE is equivalent to a half-time worker or someone working 1,040 hours in a year.

Hh**HV line extension**

High-voltage electric power transmission links used to connect generators to the electric transmission grid.

li**IMPLAN (IMpact analysis for PLANning)**

A business that is the leading provider of economic impact data and analytic applications. IMPLAN data is collected at the federal, state, and local levels and used to create state-specific and county-specific industry multipliers.

Indirect impacts

Impacts that occur in industries that make up the supply chain for that industry.

During the construction period: the changes in inter-industry purchases resulting from the direct final demand changes, including construction spending on materials and equipment and other purchases of goods and off-site services.

During operating years: the changes in inter-industry purchases resulting from the direct final demand changes.

Induced impacts

The changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes.

Inflation

A persistent rise in the general level of prices related to an increase in the volume of money and resulting in the loss of value of currency. Inflation is typically measured by the CPI.

Mm

Median Household Income (MHI)

The income amount that divides a population into two equal groups; half having an income above that amount and half having an income below that amount.

Millage rate

The tax rate, as for property, assessed in mills per dollar.

Multiplier

A factor of proportionality that measures how much a variable changes in response to a change in another variable.

MW

A unit of power, equal to one million watts or one thousand kilowatts.

MWac (megawatt alternating current)

The power capacity of a utility-scale solar PV system *after* its direct current output has been fed through an inverter to create an alternating current (AC). A solar system's rated MWac will always be lower than its rated MWdc due to inverter losses. AC is the form in which electric energy is delivered to businesses and residences and that consumers typically use when plugging electric appliances into a wall socket.

MWdc (megawatt direct current)

The power capacity of a utility-scale solar PV system *before* its direct current output has been fed through an inverter to create an alternating current. A solar system's rated MWdc will always be higher than its rated MWac.

Nn

Net economic impact

Total change in economic activity in a specific region, caused by a specific economic event.

Oo

Output

Economic output measures the value of goods and services produced in a given area. Gross Domestic Product is the economic output of the United States as a whole.

Pp

PV (photovoltaic) system

Solar modules, each comprising a number of solar cells, which generate electrical power.

Rr

Real Gross Domestic Product (GDP)

A measure of the value of goods and services produced in an area and adjusted for inflation over time.

Tt

Tax rate

The percentage (or millage) of the value of a property to be paid as a tax.

Total economic output

The quantity of goods or services produced in a given time period by a firm, industry, county, or country.

Uu

Utility-scale solar

Solar-powered electric generation facilities intended for wholesale distribution typically over 5MW in capacity.

- American Clean Power (ACP). (2025). *Clean Power Quarterly Market Report Q4, 2025*.
- Barnes, S., Holland, M., Joseph, A., Leland, E., & Willis, E. (2025, June). *U.S. Solar Industry Impact, An Economic Impact Analysis*. Kathleen Babineaux Blanco Public Policy Center, University of Louisiana at Lafayette. <https://seia.org/wp-content/uploads/2025/06/Solar-Industry-Economic-Impact-06-2025-1.pdf>
- Bessette, D., Hoen, B., Rand, J., Hoesch, K., White, J., Mills, S., and Nilson, R. (2024). Good Fences Make Good Neighbors: Stakeholder Perspective on the Local Benefits and Burdens of Large-scale Solar Energy Development in the United States. *Energy Research & Social Science*, 108 (103375). <https://www.sciencedirect.com/science/article/pii/S2214629623004358>
- Bezdek, R. H. (2007, July). *Economic and Jobs Impacts of the Renewable Energy and Energy Efficiency Industries: U.S. and Ohio* [PowerPoint Slides]. Presented at SOLAR 2007, Cleveland, Ohio. https://www.utoledo.edu/centers/urban-affairs/publications/jobs_report.pdf
- Center for Competitive Florida. (2009, April). *The Positive Economic Impact of Solar Energy on the Sunshine State*. Florida TaxWatch. <https://floridataxwatch.org/Research/Blog/ArtMID/34888/ArticleID/15997/The-Positive-Economic-Impact-of-Solar-Energy-on-the-Sunshine-State>
- Croucher, M. (2012). Which state is Yoda? *Energy Policy*, 42(C), 613-615.
- Federal Reserve Bank of St. Louis Economic Data (FRED). (2025). *Median Household Income*. <https://fred.stlouisfed.org/searchresults/?st=Median%20household%20income>
- Federal Reserve Bank of St. Louis Economic Data (FRED). (2025). *Real Gross Domestic Product*. <https://fred.stlouisfed.org/searchresults?st=real+gross+domestic+product>
- Federal Reserve Bank of St. Louis Economic Data (FRED). (2025). *Employed Persons*. <https://fred.stlouisfed.org/searchresults?st=employment>
- Federal Reserve Bank of St. Louis Economic Data (FRED). (2025). *Population Estimates*. <https://fred.stlouisfed.org/searchresults/?st=population>
- Federal Reserve Bank of St. Louis Economic Data (FRED). (2025). *Unemployment Rate*. <https://fred.stlouisfed.org/searchresults/?st=unemployment&t=il&rt=il&ob=sr>
- IMPLAN Group LLC. (2025). Huntersville, NC. implan.com
- Jenniches, S. (2018). Assessing the Regional Economic Impacts of Renewable Energy Sources. *Renewable and Sustainable Energy Reviews*, Elsevier, 93, 35-51. <https://www.sciencedirect.com/science/article/pii/S1364032118303447>
- Loomis, D.G., Jo, J.H., & Aldeman, M.R. (2016). Economic impact potential of solar photovoltaics in Illinois. *Renewable Energy*, 87(1), 253-258. <https://doi.org/10.1016/j.renene.2015.10.021>
- Michaud, G., Khalaf, C., Zimmer, M. & Jenkins, D. (2020). *Measuring the economic impacts of utility-scale solar in Ohio*. Developed for the Utility Scale Solar Energy Coalition of Ohio (USSEC). <https://www.ohio.edu/voinovich-school/news-resources/reports-publications/utility-scale-solar>

Seel, J., Kemp, J.M., Cheyette, A., Gorman, W., Darghouth, N., Robson, D., Rand, J., & Jeong, S. (2025, October). *U.S. Utility-Scale Solar, 2025 Data Update*. Lawrence Berkeley National Laboratory. <https://emp.lbl.gov/sites/default/files/2025-10/Utility%20Scale%20Solar%202025%20Edition%20Slides.pdf>

Solar Energy Industries Association (SEIA). (2021). *Solar Market Insight Report Q3, 2021*. <https://www.seia.org/research-resources/solar-market-insight-report-2021-q3>

Solar Energy Industries Association (SEIA). (2025). *Solar Market Insight Report 2025 Year in Review*. <https://seia.org/research-resources/solar-market-insight-report-2025-year-in-review/>

Solar Energy Industries Association (SEIA). (2025). *Solar State by State* [Interactive Map]. <https://seia.org/solar-state-by-state/>

U.S. Bureau of Labor Statistics. (2024). *Occupational Employment and Wage Statistics (OEWS) Tables* [Data set]. <https://www.bls.gov/oes/tables.htm>

U.S. Department of Energy. (2025). *United States Energy & Employment Report: Energy Employment by State 2025*. https://www.energy.gov/sites/default/files/2025-09/USEER%202025%20States%20090825_Fnl.pdf

U.S. Energy Information Administration (EIA). (2024). *Monthly Generation Data by State, Producer Sector and Energy Source* [Data set]. Form EIA-923. <https://www.eia.gov/electricity/data/eia923/>

United States Census Bureau. (2025). *QuickFacts*. <https://www.census.gov/>

X. Curriculum Vitae (Abbreviated)

DAVID G. LOOMIS

Strategic Economic Research, LLC

President

Education

Doctor of Philosophy (PhD), Economics, Temple University, Philadelphia, Pennsylvania, May 1995

Bachelor of Arts (BA), Mathematics and Honors Economics, Temple University, Magna Cum Laude, May 1985

Experience

2011 – present, Strategic Economic Research, LLC

- Supervises all aspects of analysis and report creation
- Performed over 500 economic impact analyses on policy initiatives and energy projects, such as wind energy, solar energy, natural gas plants, and transmission lines, at the county and state levels
- Provided expert testimony more than 100 times in formal proceedings before state legislative bodies, state public utility commissions, and county boards regarding wind, solar, and transmission projects
- Grew the company from a single employee to over 25 team members

1996 – 2023, Department of Economics at Illinois State University, Normal, IL

Professor Emeritus – (2023 - present)

Full Professor – (2010 - 2023)

Associate Professor – (2002 - 2009)

Assistant Professor – (1996 - 2002)

- Taught Regulatory Economics; Telecommunications Economics and Public Policy; Industrial Organization and Pricing; Individual and Social Choice; Economics of Energy and Public Policy; and a Graduate Seminar Course in Electricity, Natural Gas, and Telecommunications Issues
- Supervised up to five graduate students in research projects each semester and served on numerous departmental committees

1997 – 2023, Institute for Regulatory Policy Studies, Normal, IL

Executive Director (2005 - 2023)

Co-Director (1997 - 2005)

- Grew contributing membership from five companies to 16 organizations
- Doubled the number of workshop/training events annually
- Supervised two directors, administrative staff, and the internship program
- Developed and implemented state-level workshops concerning regulatory issues related to the electric, natural gas, and telecommunications industries

2006 – 2018, Illinois Wind Working Group, Normal, IL

Director

- Founded the organization and grew the organizing committee to over 200 key wind stakeholders
- Organized an annual wind energy conference with over 400 attendees
- Organized strategic conferences to address critical wind energy issues
- Initiated monthly conference calls to stakeholders
- Devised organizational structure and by-laws

2007 – 2018, Center for Renewable Energy, Normal, IL

Director

- Created founding document approved by the Illinois State University Board of Trustees and Illinois Board of Higher Education
- Secured over \$150,000 in funding from private companies
- Hired and supervised four professional staff members and supervised three faculty members as Associate Directors
- Reviewed renewable energy manufacturing grant applications for the Illinois Department of Commerce and Economic Opportunity for a \$30 million program
- Created technical “Due Diligence” documents for the Illinois Finance Authority loan program for wind farm projects in Illinois
- Published 40 articles in leading journals, such as *AIMS Energy*, *Renewable Energy*, *National Renewable Energy Laboratory Technical Report*, *Electricity Journal*, *Energy Economics*, *Energy Policy*, and many others
- Raised over \$7.7 million in grants and over \$2.7 million in external funding

BRYAN A. LOOMIS

Strategic Economic Research, LLC

Vice President

Education

Master of Business Administration (MBA), Belmont University, Nashville, Tennessee, 2017

Experience

2019 – present, Strategic Economic Research, LLC

- Serves as lead analyst on economic impact reports, overseeing all aspects of analysis and report creation
- Communicates with developers about economic impact, property tax, and land use analyses
- Conducts non-standard analyses and memos for unique energy-related projects, such as statewide legislation, property tax impacts on school district state aid, and analyzing eligibility for energy community bonus adders to tax credits
- Oversees improvements to both reports and team processes

Expert Testimony

- Provides third-party expert testimony on behalf of developers for special-use permitting hearings, county board proceedings, and boards of zoning appeals (in seven states thus far)

Property Tax Analysis and Land Use Director (2019 - 2021)

- Directed the property tax analysis by training other associates on the methodology and overseeing the process for over twenty states
- Improved the property tax analysis methodology by researching various state taxing laws and implementing depreciation, taxing jurisdiction millage rates, and other factors into the tax analysis tool
- Executed land use analyses by running Monte Carlo simulations of expected future profits from farming and comparing that to the solar lease
- Performed economic impact modeling using JEDI and IMPLAN tools
- Improved workflow processes by capturing all tasks associated with economic modeling and report-writing, and created automated templates in Asana workplace management software

2019 – 2021, Viral Healthcare Founders LLC, Nashville, TN CEO and Founder

CHRISTOPHER THANKAN

Strategic Economic Research, LLC

Director of Economic Impact Analysis

Education

Bachelor of Science in Sustainable & Renewable Energy (BS), Minor in Economics, Illinois State University, Summa Cum Laude, Normal, IL, 2021

Experience

2021 – present, Strategic Economic Research, LLC

- Creates economic impact results for hundreds of renewable energy projects
- Utilizes IMPLAN software and Excel for analyses and update models, procedures, methodologies, etc.
- Quality checks internal team members' analysis and project cost information from clients
- Addresses client questions and concerns about analysis and reports
- Developed SER's proprietary economic impact analysis model
- Improved property tax analysis methodology and conducted property tax analysis for different U.S. states
- Researched taxation in states outside research portfolio
- Researched school funding and the impact of renewable energy on state aid to school districts and completed ad hoc research requests given by the company president

Expert Testimony

- Provided expert testimony in formal proceedings before county boards and boards of zoning appeals in Kansas, Illinois, and South Dakota
- Served as an economic impact expert for open house meetings in Colorado and New Mexico
- Presented on economic impacts of renewable energy projects in Missouri for the 2024 Midwest Energy Policy Series Renewables & Efficiency Conference in Columbia, MO
- Hosted and presented on numerous SER webinars discussing economic impacts and successful permitting

DEBORAH DINGESS

Strategic Economic Research, LLC

Director of Tax Research

Education

Master of Science in Taxation (MST), University of Cincinnati - Carl H. Lindner College of Business, Cincinnati, OH, August 2021

Bachelor of Arts in Financial Economics and Business Management (BA), Capital University, Columbus, OH, August 2012

Experience

2025 – present, Strategic Economic Research, LLC

- Leads local tax research for utility-scale renewable energy projects across all 50 states
- Analyzes state and local tax codes, regulations, and case law related to renewable energy projects
- Develops and refines standardized local tax research templates, process documentation, and modeling tools
- Delivers local tax guidance to clients, permitting teams, zoning boards, and local government stakeholders
- Provides third-party expert testimony on tax methodology in local permitting proceedings on behalf of developers

Expert Testimony

- Provided expert testimony in formal proceedings before county boards and boards of zoning appeals in Ohio

2024 – 2025, Lumen Technologies, Denver, CO

Senior Tax Analyst, Transaction Tax and Compliance

- Prepared U.S. and Canadian transaction tax filings (sales/gross receipts/excise; GST/HST/PST); leveraged SAP and Alteryx
- Streamlined SOPs and training; researched U.S./international tax changes; resolved jurisdictional notices and exams

2019 – 2024, IGS Energy, Dublin, OH

Senior Tax Analyst (2023 - 2024)

Tax Analyst (2019 - 2023)

- Filed multi-state sales, property, and excise taxes across entities
- Established automations and tax reporting improvements
- Partnered with Finance and cross-functional teams on tax-sensitive initiatives

2016 – 2019, OhioHealth, Columbus, OH

Tax Analyst (2018 - 2019)

Senior Accountant (2017 - 2018)

Accountant (2016 - 2017)

- Managed CAT, local, and multi-state tax filings; coordinated with external firms on tax return preparation; supported month-end close

2014 – 2015, Penn National Gaming, Columbus, OH

Accountant (2015)

Revenue Auditor (2014)

2013, American Electric Power, Columbus, OH

Cost Coordinator (2013)

SAWYER KEITHLEY

Strategic Economic Research, LLC
Manager of Research & Analysis
Front Matter Team Lead

Education

Master of Science in Applied Economics (MS), Sequence in Electricity, Natural Gas, and Telecommunications, Illinois State University, Normal, IL, 2024

Bachelor of Science in Managerial Economics (BS), Minor in Business Administration, Magna Cum Laude, Illinois State University, Normal, IL, 2022

Experience

2021 – present, Strategic Economic Research, LLC

- Uses cost inputs from customers to forecast potential new employment, output, and earnings impacts created by the proposed energy project
- Leads a team to gather data, write, and edit narratives for county-specific or state-specific tables and graphs
- Compiles project-specific information and researches property tax information for the county of interest
- Designed and implemented a standardized land use reporting framework for project analysis, successfully quantifying and highlighting the net land use impacts of solar projects across agricultural and forestry sectors (cropland, pastureland, and timberland)

Expert Testimony

- Provided expert testimony in formal proceedings before a county board and board of zoning appeals in Iroquois County, Illinois

June 2023 – August 2023, Nicor Gas, Rates Department

Rates Intern

- Conducted independent research to update the cost factors used by the company for feasibility studies and wrote a summary report for project findings
- Gathered historical and current information about the natural gas industry and analyzed patterns in legislation surrounding the future of natural gas

TIMOTHY ROBERTS

Strategic Economic Research, LLC
Manager of Data Analysis
Tax Team Lead

Education

Institute for Professionals in Taxation (IPT) – Property Tax School, Certificate of Completion (2025)

Experience

2022 – present, Strategic Economic Research, LLC

- Oversees the company's tax team, manages a group of analysts, and ensures accuracy and consistency across deliverables
- Leads client communication by reviewing project inputs, addresses technical questions, and provides explanations of tax law and research
- Researches state and county local tax policies and develops state-specific valuation templates across multiple renewable energy technologies
- Designs, manages, and maintains the company's internal database, ensuring data accuracy across projects
- Develops custom programs and applications using Python and other programming tools to streamline workflows, automate repetitive tasks, and improve data quality
- Creates external-facing websites to support company projects
- Provides training, mentorship, and oversight to analysts
- Conducted and reviewed over 300 local tax analyses, as well as economic impact analyses, land use analyses, and county-level economic analyses for renewable energy projects nationwide
- Contributed to company recognition, including a prestigious award from Google for Renewable Energy Leadership



Strategic
Economic
Research, LLC

1604 Visa Drive Suite #1
Normal, IL 61761

strategiceconomic.com

815-905-2750

LAND USE ANALYSIS OF THE MACKINAW SOLAR PROJECT

August 2026

Dr. David G. Loomis, Bryan Loomis,
and Sawyer Keithley

Strategic Economic Research, LLC
strategiceconomic.com
815-905-2750

About the Authors



Dr. David G. Loomis

President of Strategic Economic Research, LLC
Professor Emeritus of Economics,
Illinois State University
Co-Founder of the Center for Renewable Energy

Dr. David G. Loomis is Professor Emeritus of Economics at Illinois State University and Co-Founder of the Center for Renewable Energy. Dr. Loomis has over 20 years of experience in energy analysis and has performed economic development analyses at the county, region, state, and national levels for many different energy projects and associated supply chains.

Dr. Loomis has testified before Public Utility Commissions or local county boards in Colorado, Illinois, Iowa, Kansas, Kentucky, Louisiana, Michigan, Missouri, New Mexico, Ohio, Pennsylvania, West Virginia, and Wisconsin. As a widely recognized expert, he has appeared on *CNN* and been quoted in *The Wall Street Journal*, *Forbes Magazine*, *The Associated Press*, and the *Chicago Tribune*. In addition to publishing 40 peer-reviewed articles in leading energy policy and economics journals, he has raised and managed over \$8 million in grants and contracts from government, corporate, and foundation sources. Dr. Loomis received his Ph.D. in economics from Temple University in 1995.



Bryan Loomis, MBA

Vice President of Strategic Economic Research, LLC

Bryan Loomis has conducted economic impact, property tax, and land use analyses at Strategic Economic Research since 2019. He has performed or overseen more than 200 wind and solar analyses and provided expert testimony for permitting hearings across several states, including Colorado, Kansas, Indiana, Illinois, and Iowa. Bryan enhanced SER's property tax methodology by incorporating state tax laws, depreciation, and millage rates into the firm's analysis tools. Before joining SER, he managed a consulting agency supporting over 30 technology startups, and he earned his MBA from Belmont University in 2016.



Sawyer Keithley

Manager of Research and Analysis,
Front Matter Team Lead
Strategic Economic Research, LLC

Sawyer leads the team responsible for collecting, analyzing, and visualizing state and county-level information to provide background for Strategic Economic Research's economic impact reports and land use analyses. Additionally, they perform economic and property tax analyses. Sawyer Keithley has a Master of Science degree in Applied Economics with a Sequence in Electricity, Natural Gas, and Telecommunications.

Strategic Economic Research, LLC (SER) provides economic impact and local tax analyses for energy projects throughout the United States. SER reports show the jobs, earnings, output, and property taxes that these projects bring to local communities. The company has analyzed over 700 projects (over 132 gigawatts of energy) in 40 states. SER has grown to over 25 employees across the country. For more information about the associates who contribute to SER's reports, visit our website: strategiceconomic.com/about

Table of Contents



I. Current and Proposed Usage Statistics	1
II. The Economic Impacts of Shifting Agricultural Land to Solar Use	9
III. Agricultural Trends.	15
IV. Landowner Profits.	23
V. Glossary	29
VI. References	31
VII. Curriculum Vitae (Abbreviated)	33



Figure 1.1 – Number of Farms in Tazewell County from 1992 to 2022	1
Figure 1.2 – Land in Farms in Tazewell County from 1992 to 2022	1
Figure 1.3 – Percentage of Project Area Utilized for Crops and Non-Agricultural Use from 2020 to 2024.	3
Figure 1.4 – National Commodity Crop Productivity Index Ratings for the Mackinaw Solar Project Footprint	4
Figure 1.5 – Prime Farmland in the United States	5
Figure 1.6 – Land Classification for the Mackinaw Solar Project Footprint.	6
Figure 1.7 – Map of Transmission Lines Near Project.	7
Figure 1.8 – Global Horizontal Solar Irradiance in the United States	8
Figure 2.1 – Employment Impacts from Agriculture and Solar.	12
Figure 2.2 – Labor Income Impacts from Agriculture and Solar	12
Figure 2.3 – Output Impacts from Agriculture and Solar	13
Figure 3.1 – Historical Yield Increase of Corn in Tazewell County	15
Figure 3.2 – Historical Yield Increase of Soybeans in Tazewell County	16
Figure 3.3 – Expected Production of Corn in Tazewell County with Decreased Acreage.	17
Figure 3.4 – Expected Production of Soybeans in Tazewell County with Decreased Acreage.	18
Figure 3.5 – End Uses for Corn in Millions of Bushels	20
Figure 3.6 – End Uses for Soybeans in Millions of Pounds.	21
Figure 4.1 – Simulations of Real Profits Per Acre Based on Data from 1992.	28



Table 2.1 – Employment Impacts from Land Use	11
Table 2.2 – Labor Income Impacts from Land Use.	11
Table 2.3 – Output Impacts from Land Use.	11
Table 2.4 – Net Impacts of the Mackinaw Solar Project During Construction	14
Table 2.5 – Net Impacts of the Mackinaw Solar Project During Operations.	14
Table 3.1 – Likely End Uses for Corn and Soybeans	19
Table 4.1 – Agricultural Statistics for Tazewell County, Illinois	24
Table 4.2 – Machinery Depreciation and Opportunity Cost of Farmer’s Time for Tazewell County, Illinois	25
Table 4.3 – Profit Per Farm Calculations for Tazewell County, Illinois	26

I. Current and Proposed Usage Statistics

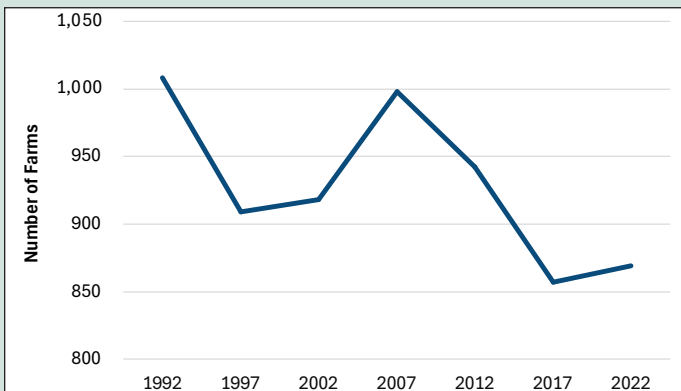


The farming industry has fluctuated in Tazewell County, Illinois. As shown in Figure 1.1, the number of farms hit a high of 1,008 in 1992 and a low of 857 in 2017.



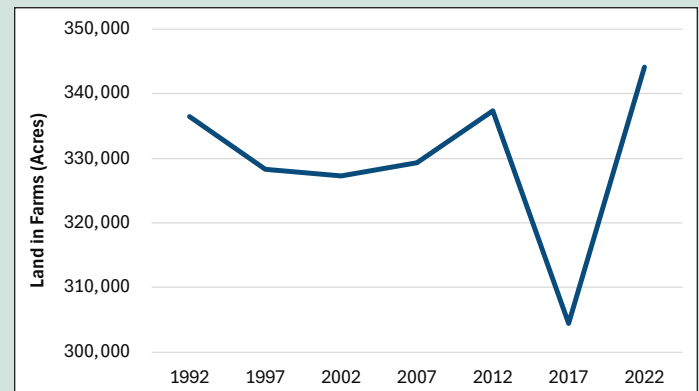
According to Figure 1.2, the amount of land in farms has fluctuated in Tazewell County. The county farmland hit a low of 304,475 acres in 2017 and a high of 344,083 acres in 2022.

Figure 1.1 – Number of Farms in Tazewell County from 1992 to 2022



Source: USDA NASS, Census of Agriculture, 1992-2022

Figure 1.2 – Land in Farms in Tazewell County from 1992 to 2022



Source: USDA NASS, Census of Agriculture, 1992-2022



According to the 2022 Census of Agriculture, Illinois is ranked sixth among U.S. states in total value of agricultural products sold. It is ranked 24th in the value of livestock and third in the value of crops. The average net cash farm income per farm is \$140,625 (USDA NASS, 2024a). In 2025, Illinois had 69,600 farms and 26.1 million acres in operation with the average farm being 375 acres. Illinois had 980 thousand cattle and produced over 1.6 billion pounds of milk. In 2025, Illinois yields averaged 214 bushels per acre for corn with a total market value of over \$9.7 billion. Soybean yields averaged 62.5 bushels per acre with a total market value of over \$6.7 billion (USDA NASS, 2026).

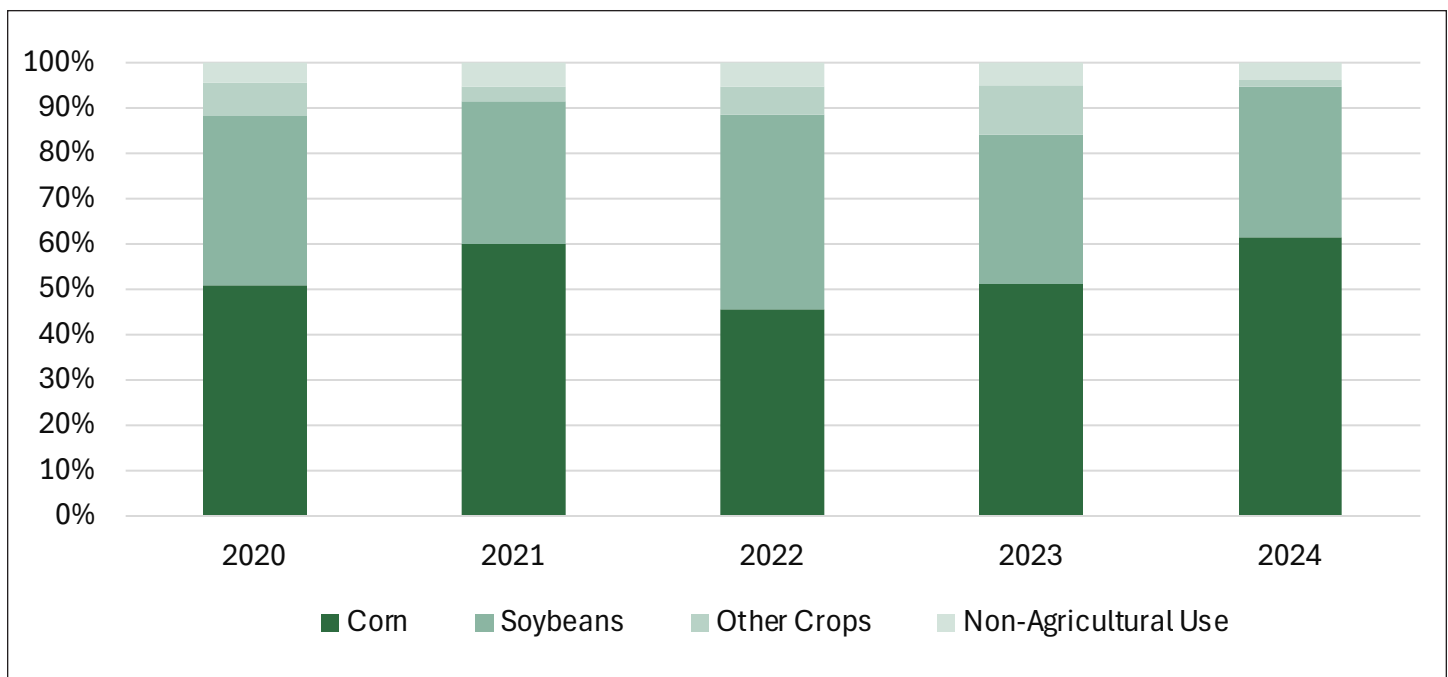
In 2022, Tazewell County had 869 farms covering 344,083 acres for an average farm size of 396 acres. The total market value of products sold was \$378 million, with 8% coming from livestock sales and 92% coming from crop sales. The average net cash farm income of operations was \$194,233 (USDA NASS, 2024).

Since the late 1990s, the NASS has provided Cropland Data Layer (CDL) information in many states, and in all contiguous states since 2009. CDL uses satellite imagery to identify crop types and other land uses. The USDA has an online resource, CroplandCROS, that can be used to access CDL data.



The Mackinaw Solar Project (the Project) footprint is estimated to include 2,750 acres of land within Tazewell County. This represents the expected land taken out of agricultural production for the Project, rather than the total acreage of all signed parcels, which may be larger. The CDL data shows that crops have been grown on approximately 2,617 acres of the Project footprint between 2020 and 2024. Over that time, the top two crops grown within the Project footprint were corn and soybeans. Figure 1.3 shows the land use for the last five years.

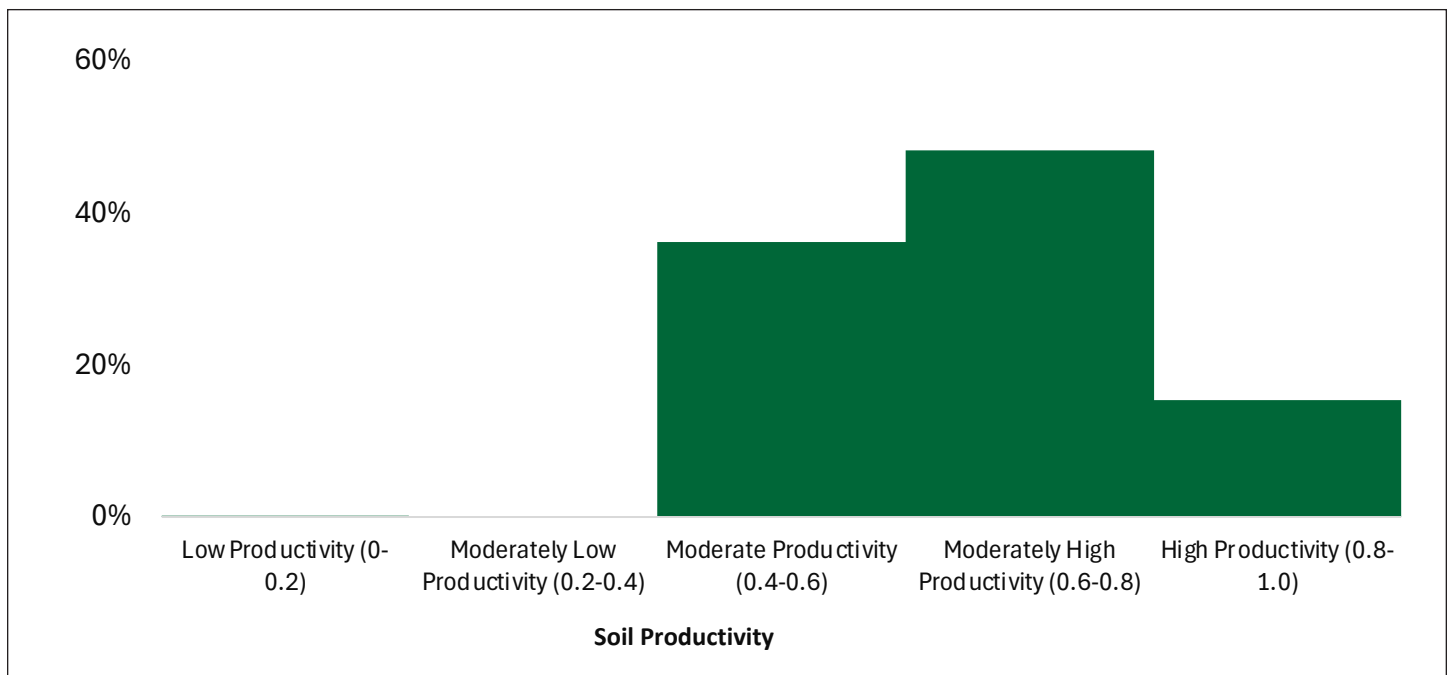
Figure 1.3 – Percentage of Project Area Utilized for Crops and Non-Agricultural Use from 2020 to 2024



Source: USDA NASS, CDL, Land Use, 2020-2024

The National Resources Conservation Service (NRCS), another division of the USDA, publishes information on soil quality and land classification across the United States. They developed the National Commodity Crop Productivity Index (NCCPI), a national interpretation for nonirrigated commodity crops that examines the soil, landscape, and climate in order to model potential crop growth and health. The NCCPI uses a scale between 0 and 1, with a land rating close to 0 being the least productive, and a land rating close to 1 being the most productive. Figure 1.4 shows the NCCPI ratings for the Project footprint.

Figure 1.4 – National Commodity Crop Productivity Index Ratings for the Mackinaw Solar Project Footprint



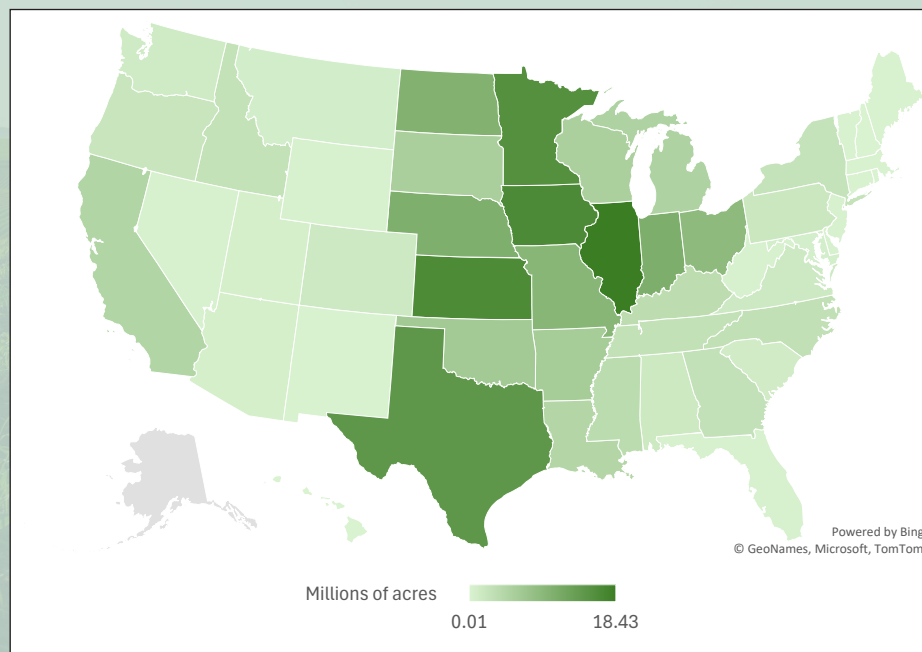
Source: USDA NRCS, Web Soil Survey, NCCPI Rating, 2025

The NRCS also publishes information on the classification of land across the United States. In general, land is classified as prime farmland if it has a combination of specific characteristics that make it useful for producing food, feed, oilseed crops, and others. Land can also be classified as unique farmland if it is useful for producing specific fruits and vegetables like citrus, tree nuts, olives, and cranberries. Beyond these national classifications, state agencies can classify land as farmland of statewide importance, and local agencies can classify land as farmland of local importance.

According to the USDA's National Resources Inventory from 2017, there are over 202 million acres of U.S. prime farmland, which accounts for 55% of the nation's total cropland. Figure 1.5 below shows the distribution of prime farmland across the United States.

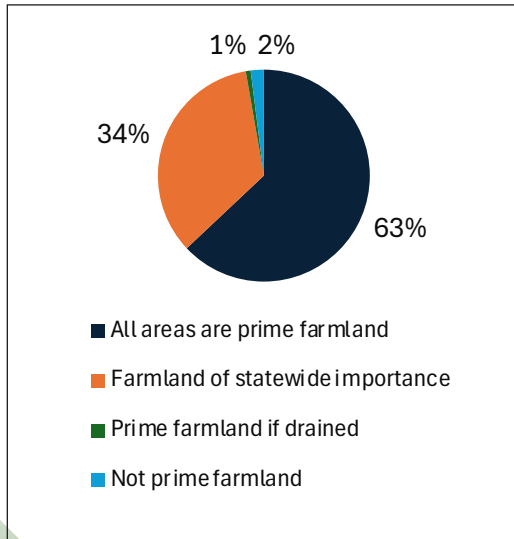
202 Million Acres = 55% of U.S. Cropland

Figure 1.5 – Prime Farmland in the United States



Source: USDA National Resources Inventory, Web Soil Survey, 2017

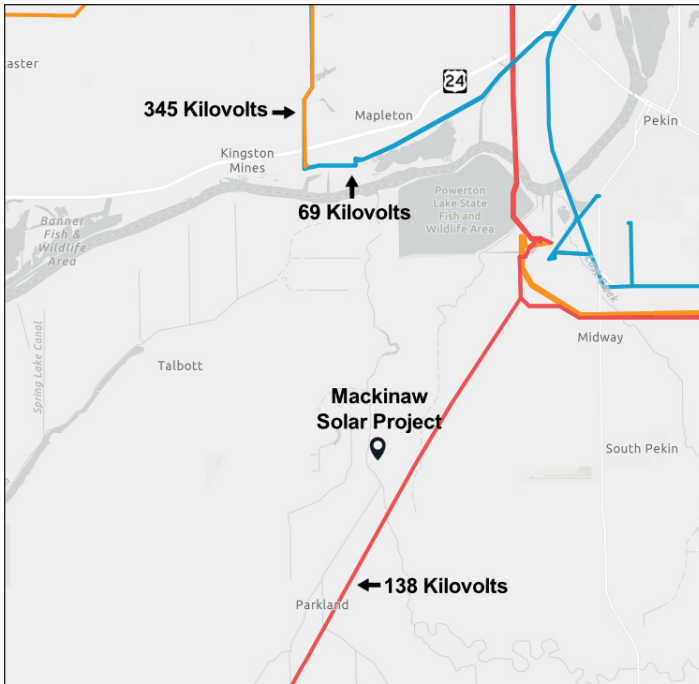
Figure 1.6 – Land Classification for the Mackinaw Solar Project Footprint



Source: USDA NRCS, Web Soil Survey, Land Classification, 2025

Illinois has 18.4 million acres of prime farmland, accounting for 76.9% of its total cropland.

Figure 1.7 – Map of Transmission Lines Near Project



Source: U.S. Electric Power Transmission Lines from Homeland Infrastructure Foundation-Level Data (HIFLD), ArcGIS GeoService

To determine if an area is suitable for a solar project, developers examine the ease of electricity grid access, the amount of sun the land receives, and the county's current policies or ordinances related to solar energy.

In order to connect the energy it generates to the electricity grid, a solar project must be tied to a transmission line. The average cost of installing a transmission line to transmit solar energy is approximately \$2.4 million per mile (Energy Information Administration (EIA), 2024).

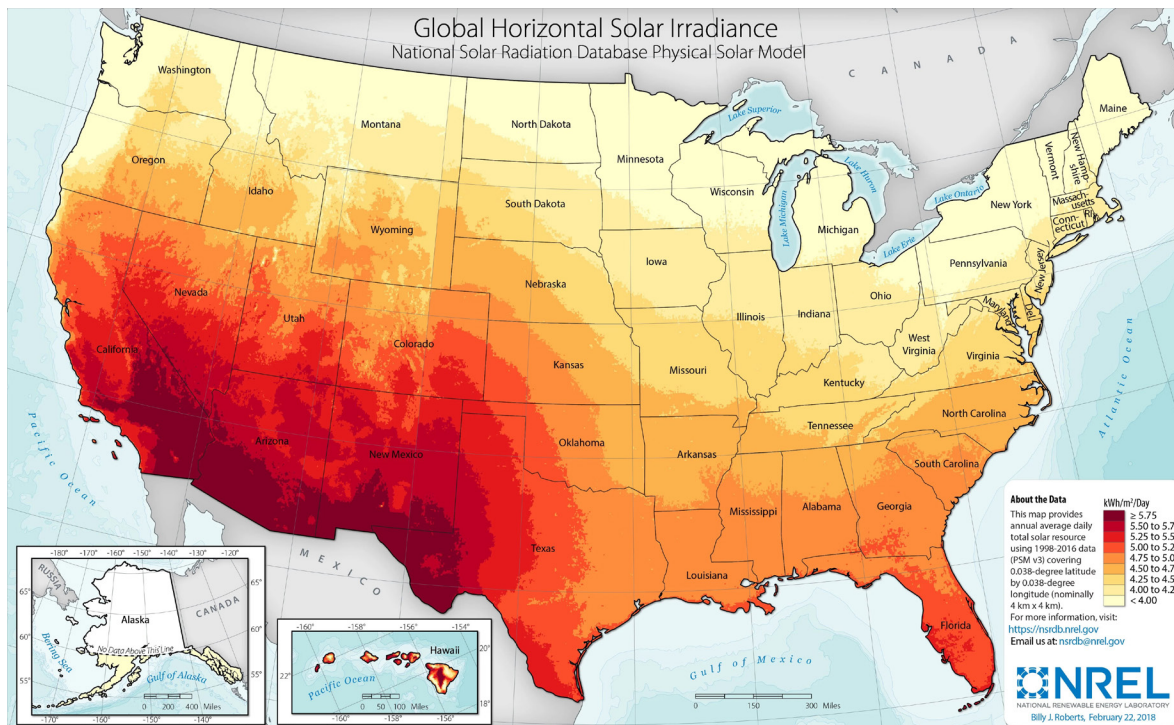
The cost of building transmission lines decreases the closer the area is to the transmission grid, making it more attractive to potential solar developers. Figure 1.7 shows the current layout of the transmission lines in the area surrounding the proposed Project.



Additionally, the amount of sun the land receives can help determine if it is a suitable location for a solar project. A common measure for this is solar irradiance, which is defined as “the amount of solar energy that arrives at a specific area of a surface during a specific time interval” (National Renewable Energy Laboratory (NREL)). Figure 1.8 shows solar irradiance levels across the United States.

Tazewell County is located in the central part of Illinois. According to Figure 1.8, the area has an estimated Global Horizontal Irradiance (GHI) between 4.00 to 4.25 kWh/m²/Day. The solar market has expanded to less sunny parts of the country in the last decade, with the average GHI of newly constructed solar projects in the United States decreasing from 5.35 kWh/m²/Day in 2013 to 4.65 kWh/m²/Day in 2021 (NREL, 2023).

Figure 1.8 – Global Horizontal Solar Irradiance in the United States



Source: Lawrence Berkley NREL, National Solar Radiation Database, 2018

9 II. The Economic Impacts of Shifting Agricultural Land to Solar Use

The economic analysis of the Project was created using IMPLAN (IMPact analysis for PLANning). IMPLAN software and parameters are based on government data collected at federal, state, and local levels. IMPLAN is a leading provider of economic development software that is widely used by economists and economic development professionals. More information about IMPLAN can be found at implan.com.

IMPLAN is an input-output model that measures the spending patterns and location-specific economic structures that reflect expenditures supporting varying levels of employment, income, and output. In other words, IMPLAN demonstrates how one industry's output can be used as an input for another. For example, the purchase of seed, fertilizer, and equipment repair not only increases demand for those items, but also supports the labor required to farm with those items. When fertilizer is purchased from a supply store, the store uses some of that money's retail margin to pay its employees. The employees then spend the money on goods and services within their community. Likewise, when a farmer hires laborers to work the land, those laborers spend money within the local economy which boosts economic activity and employment in other sectors. The goal of an economic impact analysis is to quantify all those reverberations throughout the local and state economies.

The IMPLAN model utilizes county-specific industry multipliers in its analysis. This study analyzes the gross number of jobs supported by its current use for agriculture, its proposed use for the new solar energy project, and the net difference between the two uses.

The total economic impact can be broken down into three distinct types:



Direct impacts

This refers to the labor and services needed to use the land for agriculture or solar.



Indirect impacts

Also known as supply chain impacts, consist of changes in inter-industry purchases resulting from the direct final demand changes.



Induced impacts

This refers to the changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes.



Local spending by employees, working directly or indirectly on the Project, who receive their paychecks and then spend money in the community is one example. The model includes additional local jobs and economic activity supported by the purchases of these goods and services.

The Mackinaw Solar Project is estimated to begin construction in 2029, using approximately 2,750 acres of land within Tazewell County. The following calculation is used to find the total crop output from each of the two highest crops within the Project area:

$$\text{Total Crop Output} = A \cdot P \cdot Y$$

Where A is the number of acres within the Project area used to grow the crop, P is the state's price per unit of the crop, and Y is the county's yield per acre of the crop. The *Total Crop Output* represents the value of those acres if they continued to be used for crop production.

To find the value of the agricultural acres not represented by the top two crops, the following calculation is used:



Where A is the number of Project area acres remaining after removing the top two crops in acres. The *Net Cash Income Per Farm* in the county divided by the *Average Farm Size* provides the average income per acre, which is then multiplied by the number of excess acres in current agricultural use.

$$\text{Total Output from Other Crops} = A \cdot \left(\frac{\text{Net Cash Income per Farm}}{\text{Average Farm Size}} \right)$$

The *Total Output* of all crops is the sum of the *Total Crop Output* for the top two crops and the *Total Output from Other Crops*, which is entered into IMPLAN as a “Commodity Output” under the specification “3002 - Grains.” Tables 2.1-2.3 show the annual economic impacts of continued agricultural land use versus solar use.

Table 2.1 – Employment Impacts from Land Use

	Agriculture	Solar	
	(Annual)	Construction (Total)	Operations (Annual)
1 - Direct	4.7	305	3.9
2 - Indirect	1.8	150	29.0
3 - Induced	1.0	155	15.1
Total	7.5	610	48.0

Table 2.2 – Labor Income Impacts from Land Use

	Agriculture	Solar	
	(Annual)	Construction (Total)	Operations (Annual)
1 - Direct	\$302,701	\$46,666,222	\$494,153
2 - Indirect	\$156,285	\$12,923,174	\$1,982,173
3 - Induced	\$46,355	\$7,463,406	\$739,904
Total	\$505,341	\$67,052,802	\$3,216,230

Table 2.3 – Output Impacts from Land Use

	Agriculture	Solar	
	(Annual)	Construction (Total)	Operations (Annual)
1 - Direct	\$1,280,256	\$74,210,906	\$2,099,754
2 - Indirect	\$439,705	\$31,891,885	\$3,590,756
3 - Induced	\$174,045	\$27,941,494	\$2,749,151
Total	\$1,894,006	\$134,044,285	\$8,439,661

To visually assess the difference between the economic impacts of the two potential land uses, Figures 2.1-2.3 below show that the solar Project's annual operations have a greater estimated positive economic impact than continued agricultural use.

Figure 2.1 – Employment Impacts from Agriculture and Solar

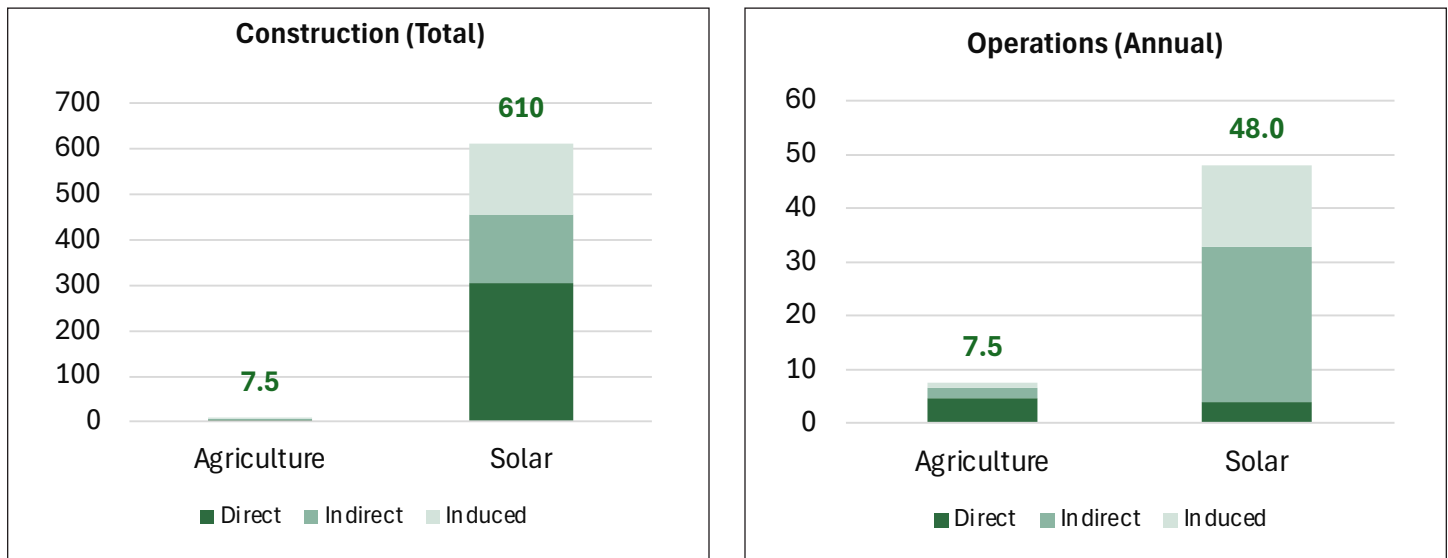


Figure 2.2 – Labor Income Impacts from Agriculture and Solar

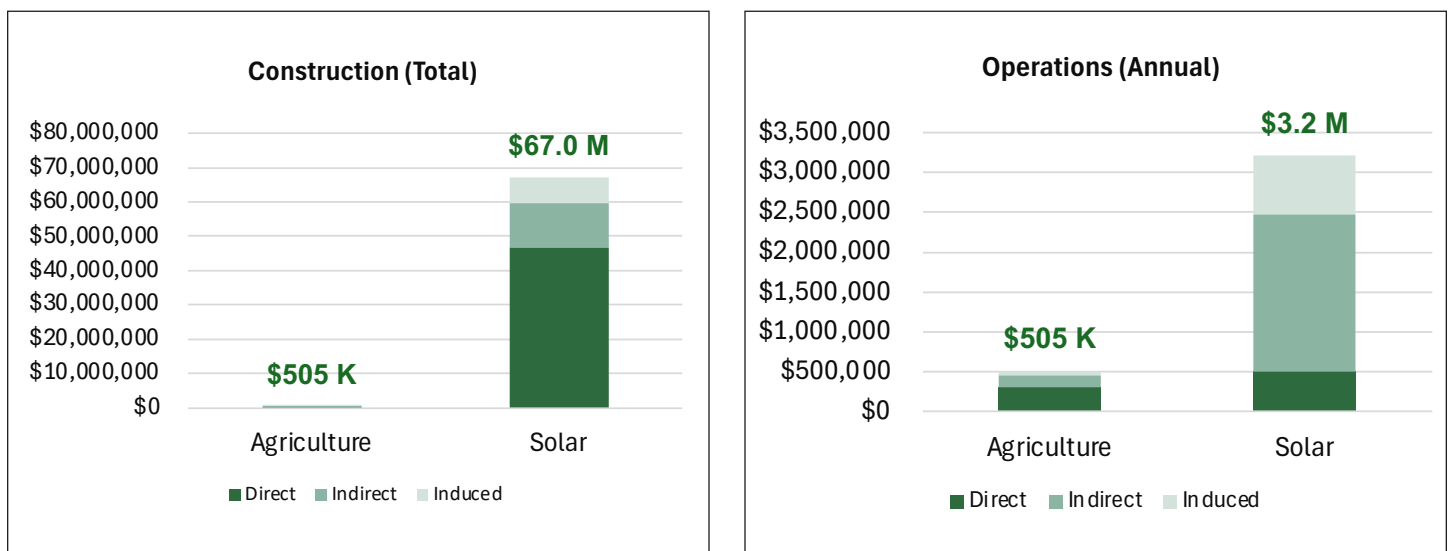


Figure 2.3 – Output Impacts from Agriculture and Solar

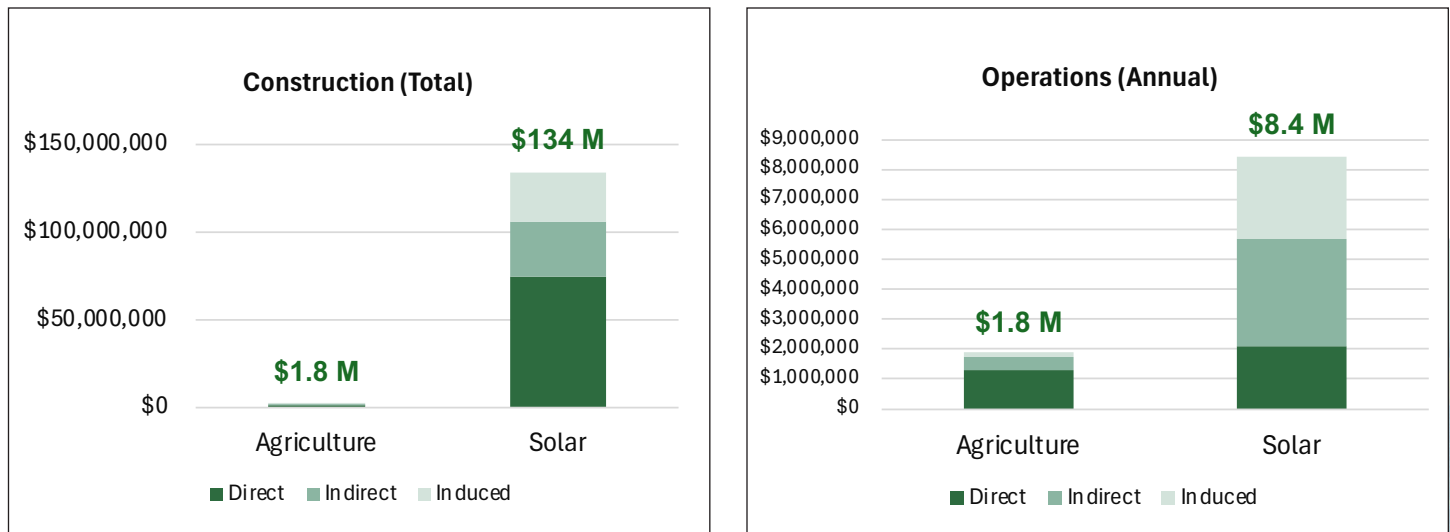


Table 2.4 shows the difference between the estimated impacts of agricultural use versus solar use throughout the proposed solar Project's construction phase. Table 2.5 shows the differences in estimated impacts during the proposed Project's operations phase. The values are found using the following formula:

$$\text{Estimated Impact of Solar} = \text{Benefits from Solar} - \text{Benefits from Agriculture}$$

Although the overall impact is positive, it is important to remember what this analysis represents and what it does not represent. This overall positive economic impact means that the value of the economic **inputs** to solar is more valuable to the county than the value of the economic **inputs** to agriculture. The economic value of producing more solar energy is captured in the **output** price that is received by the solar farm which far exceeds the **output** price that is received from agricultural goods.

Table 2.4 – Net Impacts of the Mackinaw Solar Project During Construction

	Employment	Labor Income	Output
1 - Direct	300	\$46,363,521	\$72,930,650
2 - Indirect	148	\$12,766,889	\$31,452,180
3 - Induced	154	\$7,417,051	\$27,767,449
Total	602	\$66,547,461	\$132,150,279

Table 2.5 – Net Impacts of the Mackinaw Solar Project During Operations

	Employment	Labor Income	Output
1 - Direct	(0.8)	\$191,452	\$819,498
2 - Indirect	27.2	\$1,825,888	\$3,151,051
3 - Induced	14.1	\$693,549	\$2,575,106
Total	40.5	\$2,710,889	\$6,545,655

III. Agricultural Trends

One significant agricultural trend that has been observed for over a century is that the yields of many common U.S. crops have increased over time. The USDA's Agricultural Information Bulletin states: "Over the past 70 years, there has been a remarkable increase in the yields of all major field crops in the United States, and more than half of the yield gains are attributed to genetic improvements achieved by plant breeders." According to the bulletin, these major field crops include corn, cotton, soybeans, and wheat. Other factors — beyond plant breeding — that contributed to this historical increase are improvements in pesticides, fertilizer, machinery, and labor.

This trend of increased yields is significant on a global level because it means that the same amount of agricultural output can be obtained with less land devoted to agriculture. Locally, if yields for corn and soybeans (the top crops currently being grown in the Project footprint) continue to increase across Tazewell County after the Project is placed into service, it will counter the impact of taking some agricultural land out of production. Figures 3.1 and 3.2 show the historical increases in corn and soybeans in Tazewell County.

Figure 3.1 – Historical Yield Increase of Corn in Tazewell County

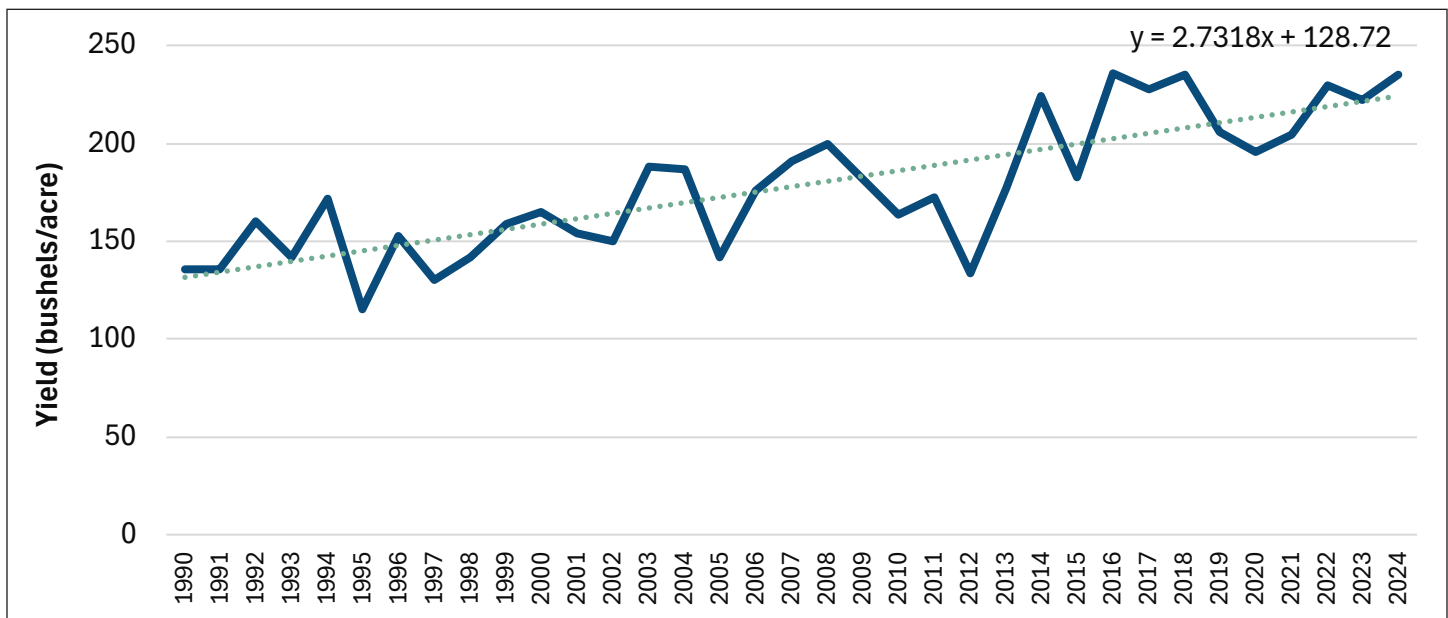
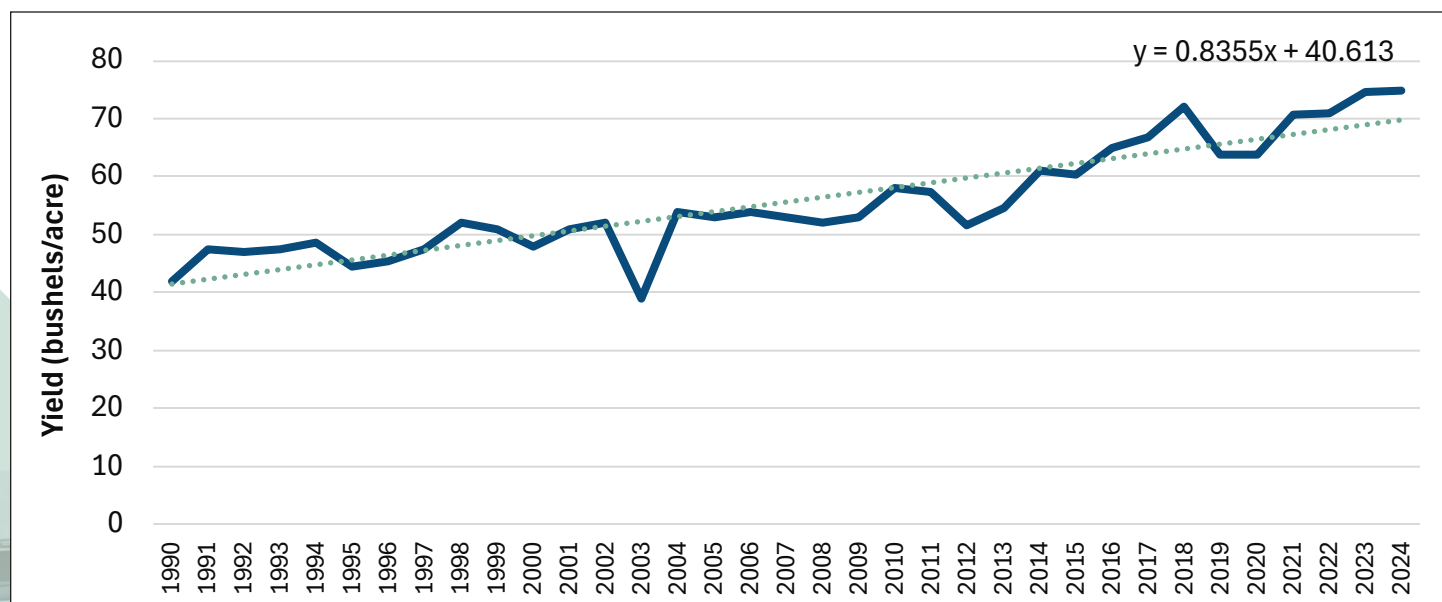


Figure 3.2 – Historical Yield Increase of Soybeans in Tazewell County



Considering there are currently 142,000 acres in Tazewell County used for corn, the Project would take 1.04% of the county's corn land out of production, thus reducing its total agricultural output. However, it is possible to offset this loss as yields for corn have been increasing by 2.79 bushels per acre annually since 1990. Therefore, less land will be needed to produce the same amount of corn. By projecting these anticipated yields into the future using a basic linear regression and holding other factors constant, it is possible to compare the county yield impacts if all agricultural land remains the same compared to the impacts if a portion of the agricultural land shifts to solar use. Figure 3.3 shows Tazewell County's resulting corn production for this analysis.

Figure 3.3 – Expected Production of Corn in Tazewell County with Decreased Acreage

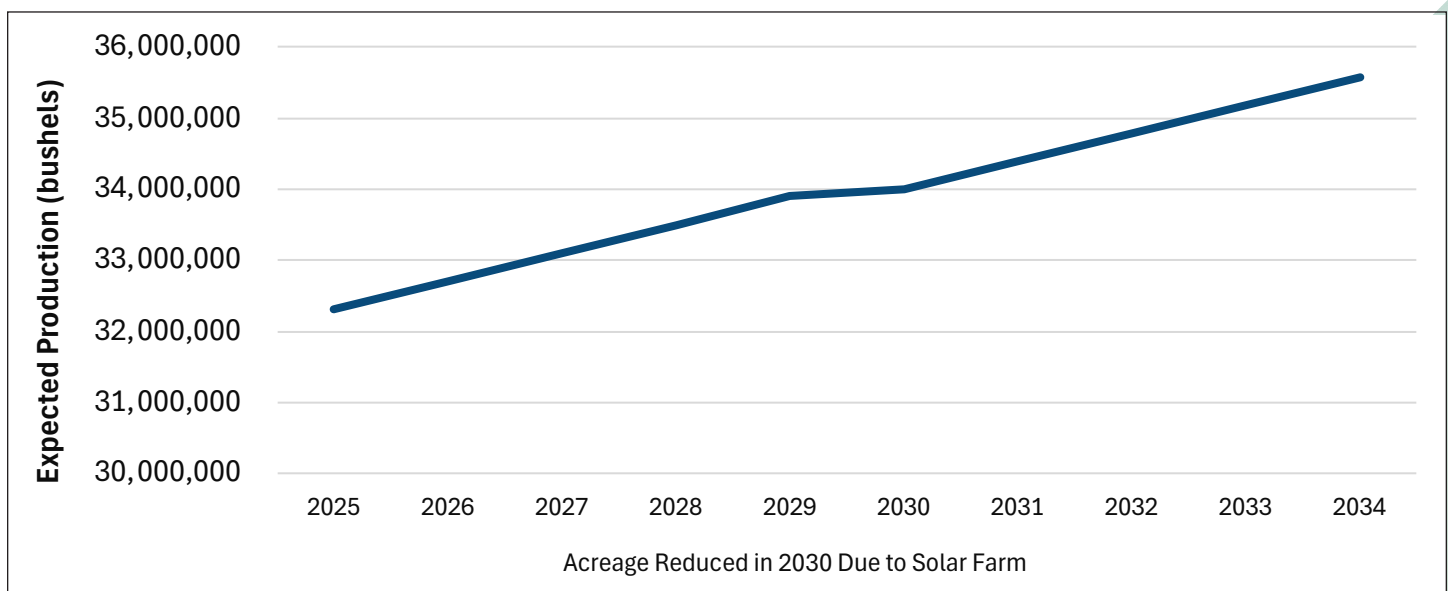
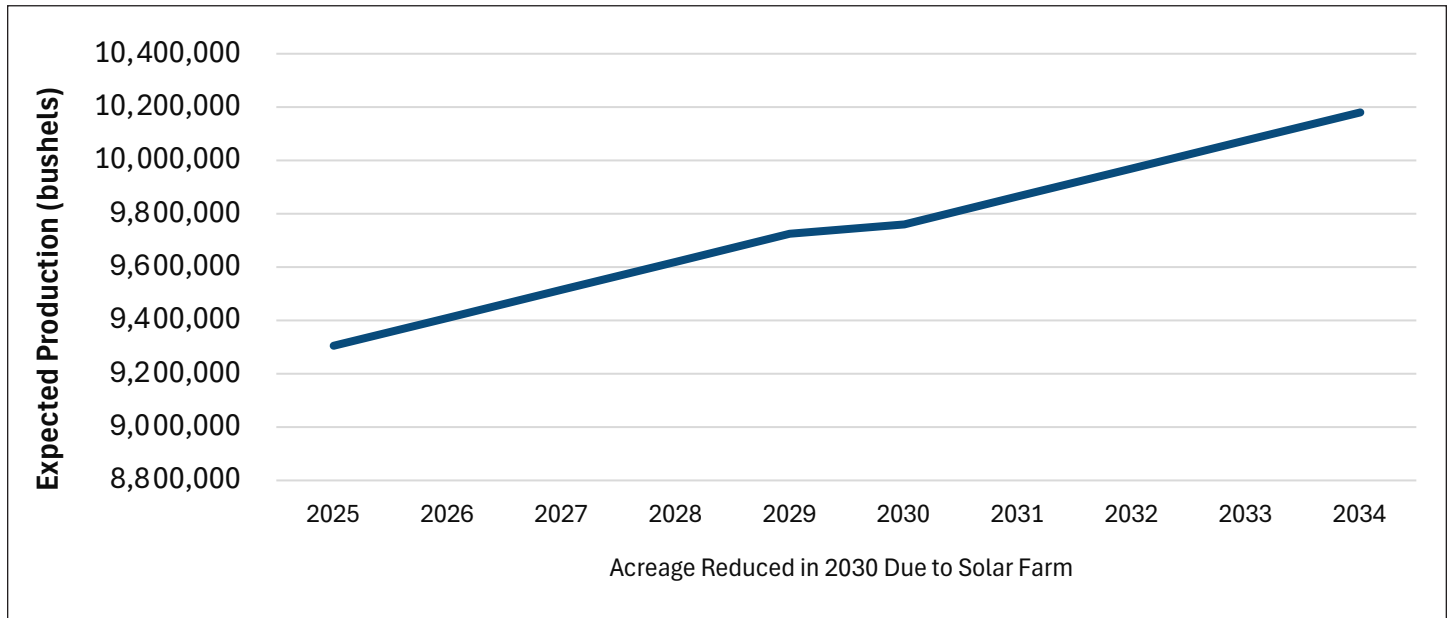


Figure 3.4 shows the same analysis for soybeans, which represents 981 acres of the Project footprint and has had an annual yield increase of 0.86 bushels per acre since 1990.

Figure 3.4 – Expected Production of Soybeans in Tazewell County with Decreased Acreage



Put another way, our analysis shows that countywide yields for corn would need to increase from the 235.3 bushels per acre grown in 2024 to 241.51 bushels per acre to result in the same amount of corn grown and compensate for the land taken out of production. If yields continue to increase according to their historical trends, this will happen in just 0.88 years, before the agricultural land required for Mackinaw Solar Project is taken out of production.

Likewise, yields for soybeans would need to reach 76.92 bushels per acre to compensate for any land taken out of production. If yields continue to increase according to their historical trends, this will happen in just 0.7 years.



Another significant agricultural trend has been the end use change in crops grown in the United States. Nationwide data from the USDA in Table 3.1 shows the current likely end uses for both corn and soybeans produced in the country. Since these crops are considered commodities, national data is appropriate to illustrate the likely end uses from an economics perspective.

Table 3.1 – Likely End Uses for Corn and Soybeans

End Use	Corn	Soybeans
Animal Feed	44%	50%
Human Consumption	12%	8%
Biofuels	44%	42%

Sources: USDA Feed Grains Section at a Glance and USDA Oil Crops Yearbook





Though the vast majority of corn and soybean production in the U.S. was used for animal feed as recently as twenty years ago, a large amount of both these crops is now allocated to biofuels. In 2001, 707 million bushels of corn were converted into alcohol for fuel (primarily ethanol), but by 2017 that number had grown to 5,605 million bushels — greater than the 5,303 million bushels used for feed and residual use combined. Figure 3.5 shows the change in end uses for corn since 1990.

Figure 3.5 – End Uses for Corn in Millions of Bushels



Source: USDA Feed Grains Database

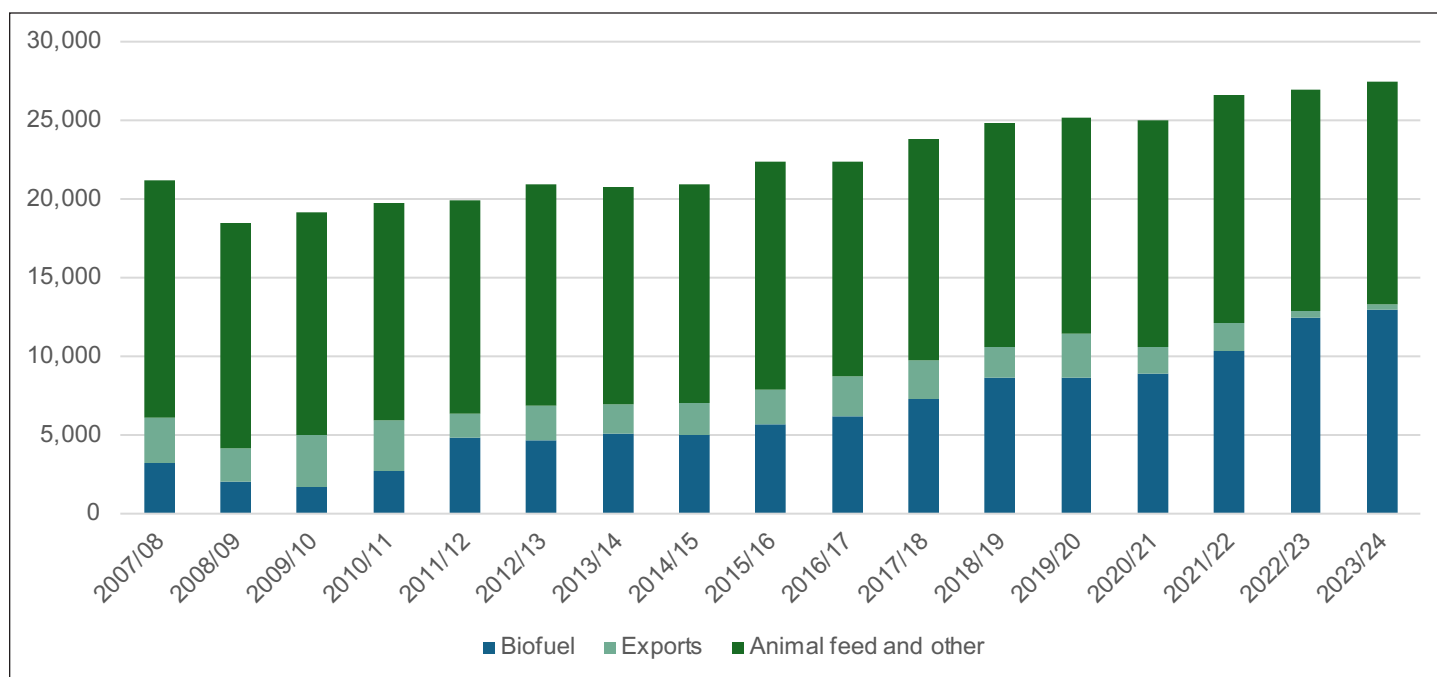


As shown in the figure above, the amount of corn exported internationally for food product and residual use has stayed mostly constant since 1990. It is important to recognize that the corn produced for human consumption is not just the sweet corn sold in grocery stores (approximately 1% of nationwide corn production), but also the field corn used for high fructose corn syrup, corn oil, beverage alcohol, cereal, corn meal, etc.

Solar is a much more efficient use of land than corn that is produced for ethanol. Research has shown that “when compared on an energy equivalent basis... solar PV generates the same amount of energy as corn ethanol in just 3.2% of the land-use footprint” (Sturchio et al., 2025).

More recently, the amount of soybeans used for biofuels has also increased substantially. Figure 3.6 shows the end uses for soybeans in the U.S. since 2007, with biofuels driving the increased demand for soybeans while other end uses, like exports and animal feed, stay mostly constant.

Figure 3.6 – End Uses for Soybeans in Millions of Pounds



Source: USDA Oil Crops Yearbook

One final, relevant agricultural trend is the practice of allowing land to lie fallow for an extended period of time. Several studies have shown that this practice increases the productivity of the land when it is returned to crop production. Cusimano et al. (2014) found that land fallowing induced significant improvements to the soil quality and future crop production in parts of California. Kozak and Pudelko (2021) studied abandoned land in Poland and determined that fallowed land can be restored to agricultural production.

Solar energy projects are compatible with agricultural land use and benefit the land while solar farms are in operation. These benefits include increased pollination, improved soil quality, and increased future production from soil fallowing. Recent research has shown that pollinating insects can help soybean yields, and improvement in pollinator habitats has been shown to boost soybean production (Garibaldi et al., 2021; de O. Milfant, 2013). According to Walston et al. (2018), planting native species in the land surrounding solar projects improves pollinator habitats, leading to increased yields, while the partial shading caused by solar panels is very beneficial to pollinators (Graham et al., 2021). Additionally, the Building Research Establishment (BRE) (2014) shows that utility-scale solar can increase biodiversity.

Solar energy projects built on agricultural lands will allow the soil to rest during the projects' operational periods. The U.S. Department of Energy (2022) states that "land can be converted back to agricultural uses at the end of the operational life for solar installations. Giving soil a rest can maintain soil quality and contribute to the biodiversity of agricultural land. On the other hand, implementing agrivoltaics and planting crops such as legumes underneath the solar installation can increase nutrient levels in the soil."



To analyze the specific economic land use decision for a solar energy facility, this section uses a methodology first proposed by Gazheli and Di Corato (2013). A “real options” model is used to look at the critical factors affecting the decision to lease agricultural land to a company desiring to install a solar-powered electric generating facility. According to their model, the landowner factors in their expected returns from the land, which include the price they can get for the crop (typically corn or soybeans), the average yields from the land (which will depend on the amount and timing of rainfall, temperature, and farming practices), and their input costs (money spent on seed, fuel, herbicide, pesticide, and fertilizer). Not considered is the fact that the landowner faces annual uncertainty in all these areas and must be compensated for the risk involved in the event that any of these parameters change in the future. In a competitive world with perfect information, the returns to the land for its productivity should relate to the cash rent for the land.

For the landowner, the key analysis will be comparing the net present value of the annual solar lease payments to expected profits from farming. The farmer will choose the solar farm lease if:

$$NPV(\text{Solar Lease Payment}_t) > NPV(P_t * \text{Yield}_t - \text{Cost}_t)$$

In this equation, NPV is the net present value, $\text{Solar Lease Payment}_t$ is the lease payment the owner receives in year t , P_t is the price that the farmer receives for the crop (corn or soybeans) in year t , Yield_t is the yield based on the number of acres and historical average of county-specific productivity in year t , and Cost_t is the total cost of farming in year t and will include the cost of seed, fertilizer, and the opportunity cost of the farmer's time. Farming profit is the difference between revenue (price times yield) and cost.

The model will use historical agricultural data from the county (or state when the county data is not available). The standard net present value calculation shown above uses the expected value of several stochastic variables (variables that have some randomness to them). To forecast returns from agriculture in future years, we apply a linear regression using an intercept and time trend on historical data to predict future profits.

$$\pi_t = \alpha + \beta * \text{time}$$

In this equation, π_t is the farming profit in year t ; α is intercept; β is the trend; time is a simple time trend starting at 1 and increasing by 1 each time period.

To analyze future returns from farming the land, this analysis factors in historical data from Tazewell County for local context. NASS publishes county-level statistics every five years. Table 4.1 shows the historical data from 1992 to 2022 for Tazewell County's total farm income, production expenses, average farm size, net cash income, and average market value of machinery per farm.

Table 4.1 – Agricultural Statistics for Tazewell County, Illinois

	1992	1997	2002	2007	2012	2017	2022
Total Farm Income Per Farm	N/A	\$3,782	\$5,293	\$5,625	\$20,128	\$17,356	\$16,099
Total Farm Production Expenses (average/farm)	\$62,091	\$79,343	\$87,680	\$113,293	\$184,744	\$184,277	\$261,024
Average Farm Size (acres)	334	361	356	330	358	355	396
Net Cash Income Per Farm	\$37,782	\$51,950	\$38,127	\$83,902	\$122,601	\$94,405	\$194,233
Average Market Value of Machinery Per Farm	\$70,322	\$93,761	\$100,956	\$126,285	\$207,022	\$216,559	\$284,142

Source: USDA NASS, Census of Agriculture, 1992-2022



The production expenses listed in Table 4.1 include all direct expenses like seed, fertilizer, fuel, etc. but do not include the depreciation of equipment or the opportunity cost of the farmer's own time in farming. To estimate these last two items, we use the average market value of machinery per farm and straight-line depreciation for 30 years with no salvage value. This is a very conservative estimate of the depreciation since the machinery will likely qualify for a shorter life and accelerated, or bonus, depreciation. To calculate the opportunity cost of the farmer's time, we obtained the mean hourly wage for farming from 1992 through 2022 from the Bureau of Labor Statistics. To be conservative, we estimate that the farmer spends a total of 16 weeks at 40 hours/week farming in a year. In actuality, a farmer likely works much longer hours while tending to the direct and administrative needs of the farm. These statistics and calculations are shown in Table 4.2.

Table 4.2 – Machinery Depreciation and Opportunity Cost of Farmer's Time for Tazewell County, Illinois

	1992	1997	2002	2007	2012	2017	2022
Average Market Value Machinery Per Farm	\$70,322	\$93,761	\$100,956	\$126,285	\$207,022	\$216,559	\$284,142
Annual Machinery Depreciation over 30 years - Straight Line (Market Value divided by 30)	\$2,344	\$3,125	\$3,365	\$4,210	\$6,901	\$7,219	\$9,471
Mean Hourly Wage in Illinois for Farming (Bureau of Labor Statistics)	\$5.76	\$6.55	\$9.31	\$11.09	\$12.10	\$13.79	\$18.27
Annual Opportunity Cost of Farmer's Time (Wage times 16 weeks times 40 Hours/Week)	\$3,688	\$4,192	\$5,958	\$7,098	\$7,744	\$8,826	\$11,693

To find the total profitability of the land, we take the mean net cash income per farm and subtract depreciation expenses and the opportunity cost of the farmer's time. We then divide that number by the average farm size, which leads to the total profit per acre. Finally, to account for inflation, we use the Consumer Price Index (CPI) to convert all profit into 2022 dollars (i.e. current dollars). These calculations and results are shown in Table 4.3.

Table 4.3 – Profit Per Farm Calculations for Tazewell County, Illinois

	1992	1997	2002	2007	2012	2017	2022
Net Cash Income Per Farm	\$37,782	\$51,950	\$38,127	\$83,902	\$122,601	\$94,405	\$194,233
Machinery Depreciation	(\$2,344)	(\$3,125)	(\$3,365)	(\$4,210)	(\$6,901)	(\$7,219)	(\$9,471)
Opportunity Cost of Farmer's Time	(\$3,688)	(\$4,192)	(\$5,958)	(\$7,098)	(\$7,744)	(\$8,826)	(\$11,693)
Profit	\$31,750	\$44,633	\$28,803	\$72,595	\$107,956	\$78,361	\$173,069
Average Farm Size (Acres)	334	361	356	330	358	355	396
Profit Per Acre	\$95.06	\$123.64	\$80.91	\$219.98	\$301.55	\$220.73	\$437.04
CPI	142	161	181	210	230	247	297
Profit Per Acre in 2022 Dollars	\$198.83	\$227.49	\$132.74	\$310.86	\$389.81	\$265.75	\$437.04



According to an unsophisticated static analysis, the farmer would be better off using his land for solar if the solar lease rental per acre exceeds the 2022 profit per acre of \$437.04 in Tazewell County, which adjusts to \$493.48 after accounting for inflation. Yet this static analysis fails to capture agricultural market dynamics or the farmer's hope that future prices and crop yields will exceed the current level. To account for these dynamics, we use the real options model discussed in the methodology section of this report. Recall that the net returns from agriculture fluctuate according to the following equation:

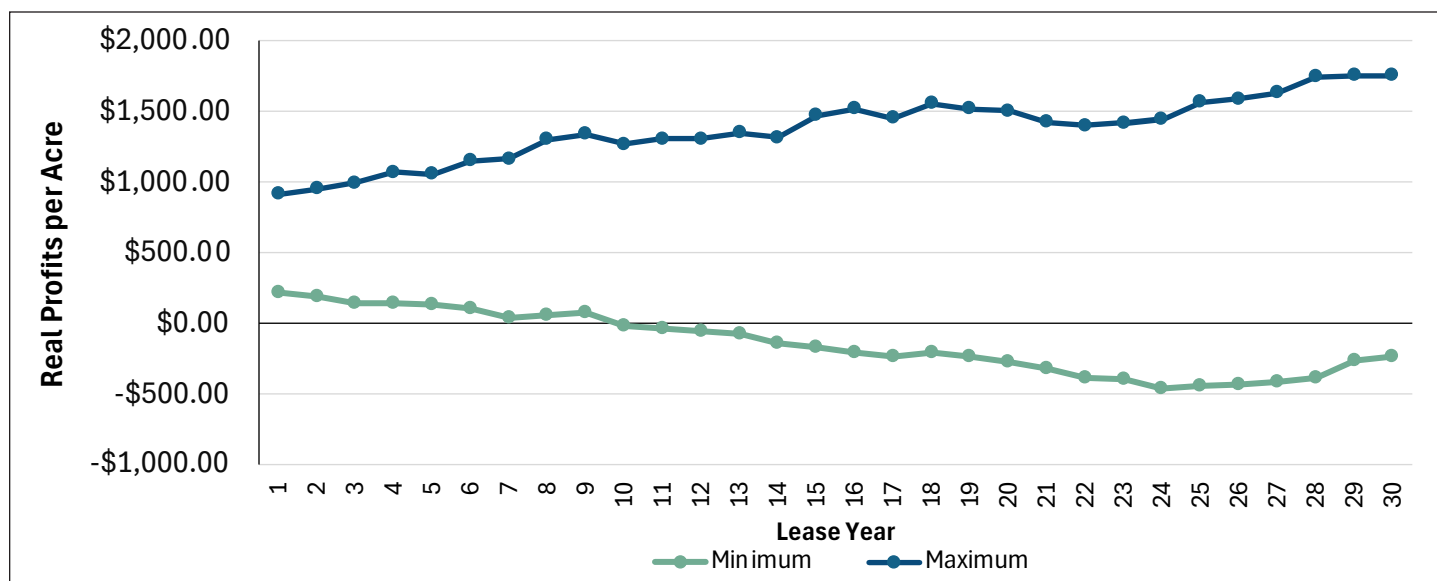
$$\pi_t = \alpha + \beta * time$$

Where π_t is the farming profit in year t ; α is intercept; β is the trend; time is a simple time trend starting at 1 and increasing by 1 each time period.

Using the Census of Agriculture data from 1992 to the present, the intercept is \$160.56 with a standard error of \$54.93. The time trend is \$7.49 with a standard error of \$2.91. This means that agricultural profits are expected to rise by \$7.49. Both the intercept and the coefficient on the time trend have a wide variation as measured by the standard error. The wide variation means that there will be significant variability in agricultural profits from year to year.



Figure 4.1 – Simulations of Real Profits Per Acre Based on Data from 1992



For the length of the lease, we assume that the profit per acre follows the equation above while still allowing for those random fluctuations. Because of this randomness, we can simulate multiple futures using a Monte Carlo simulation. We assume that the solar farm will begin operation in 2030 and operate through the end of the lease. Using 500 different simulations, the real profit per acre never exceeds \$2,455 in any single year. Overall, the maximum average annual profit over the 30 years is \$1,492 and the minimum average annual profit is \$21. Figure 4.1 is a graph of the highest and lowest real profit per acre simulations. When comparing the average annual payment projected in the maximum simulation to the solar lease per acre payment, the solar lease provides higher returns than farming in 500 of the 500 simulations. This means the farmer is financially better off under the solar lease in 100% of the 500 scenarios analyzed.

Calculating how high agricultural prices or yields would need to rise to make farming more profitable than the solar lease is another useful comparison to aid the landowner in the land use decision. If yields stayed constant, the price of corn would need to rise from its 2025 price of \$4.15 per bushel to \$9.02 per bushel in the Project's first year of operations to match the solar lease. If prices stayed constant, corn yields would need to rise from 239 bushels per acre to 519.2 bushels per acre by the first year of operations. For soybeans, if yields stayed constant, prices would either need to rise from \$10.50 in 2025 to \$25.74 in the first year of operations or yields would need to rise from 76.3 bushels per acre to 187.1 bushels per acre. In addition, either a combination of increasing prices and yields or a huge spike in agricultural profits during the proposed lease period term would make agriculture more profitable than solar, but as seen in the agricultural profit simulations above, these scenarios are very unlikely.

Cc**Cropland Data Layer (CDL)**

A database of geographical information across the contiguous United States that shows, among other items, the crops being grown in particular areas on an annual basis.

Consumer Price Index (CPI)

An index of the changes in the cost of goods and services to a typical consumer, based on the costs of the same goods and services at a base period.

Dd**Direct impacts**

During the construction period: the changes that occur in the on-site construction industries in which the direct final demand change is made.

During operating years: the final demand changes that occur in the on-site spending for the solar operations and maintenance workers.

Ff**Farming profit**

The difference between total revenue (price multiplied by yield) and total cost regarding farmland.

Gg**Global Horizontal Irradiance (GHI)**

The total amount of radiation a horizontal surface receives. This is often measured in kWh/m²/Day, or the amount of energy (kWh) the area (m²) receives each day.

li**IMPLAN (IMPact analysis for PLANning)**

A business that is the leading provider of economic impact data and analytic applications. IMPLAN data is collected at the federal, state, and local levels and used to create state-specific and county-specific industry multipliers.

Indirect impacts

Impacts that occur in industries that make up the supply chain for that industry.

During the construction period: the changes in inter-industry purchases resulting from the direct final demand changes, including construction spending on materials and equipment and other purchases of good and off-site services.

During operating years: the changes in inter-industry purchases resulting from the direct final demand changes.

Induced impacts

The changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes.

Inflation

A persistent rise in the general level of prices related to an increase in the volume of money and resulting in the loss of value of currency. Inflation is typically measured by the CPI.

Mm**Multiplier**

A factor of proportionality that measures how much a variable changes in response to a change in another variable.

Nn**Net Present Value (NPV)**

Cash flow determined by calculating the costs and benefits for each period of investment.

NREL's Jobs and Economic Development Impacts (JEDI) Model

An input-output model that measures the spending patterns and location-specific economic structures that reflect expenditures supporting varying levels of employment, income, and output.

Oo

Output

Economic output measures the value of goods and services produced in a given area. Gross Domestic Product is the economic output of the United States as a whole.

Pp

Prime farmland

A classification used by the USDA to denote land with a combination of specific characteristics that make it useful for producing food, feed, oilseed crops, and other uses.

Rr

Real options analysis

A model used to look at the critical factors affecting the decision to lease agricultural land to a company installing a solar powered electric generating facility.

Ss

Solar Irradiance

The amount of solar energy that arrives at a specific area of a surface during a specific time interval (NREL).

Stochastic

To have some randomness.

Tt

Total economic impact

The quantity of goods or services produced in a given time period by a firm, industry, county, or country.

Uu

Utility-scale solar

Solar-powered electric generation facilities intended for wholesale distribution typically over 5MW in capacity.

- Ates, A. (2025, January 5). *Corn and Other Feed Grains - Feed Grains Sector at a Glance*. USDA Economic Research Service. <https://www.ers.usda.gov/topics/crops/corn-and-other-feed-grains/feed-grains-sector-at-a-glance>
- Cusimano, J., Megdal, S.B., McLain, J.E., & Silvertooth, J.E. (2014). Study Finds Land Fallowing Improves Soil Quality in PVID. *Arizona Water Resource*, 22(1). <https://wrrc.arizona.edu/sites/wrrc.arizona.edu/files/awr%20winter%202014%2001-07-14.pdf>
- Fernandez-Cornejo, J. (2004). *The Seed Industry in U.S. Agriculture: An Exploration of Data and Information on Crop Seed Markets, Regulation, Industry Structure, and Research and Development*. USDA Economic Research Service. <https://www.ers.usda.gov/publications/pub-details?pubid=42531#overview>
- Garibaldi, L.A., Schulte, L.A., Nabaes Jodar, D.N., Gomez Carella, D.S., & Kremen, C. (2021). Time to Integrate Pollinator Science into Soybean Production. *Trends in Ecology & Evolution*, 36(7) 573-575. <https://doi.org/10.1016/j.tree.2021.03.013>
- Gazheli, A., & Corato, L. (2012, January 23). Land-Use Change and Solar Energy Production: A Real Option Approach. *FEEM Working Paper*, 90.2011. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1990148
- Graham, M., Ates, S., Melathopoulos, A.P., Moldenke, A.R., DeBano, S.J., Best, L.R., & Higgins, C.W. (2021). Partial shading by solar panels delays bloom, increases floral abundance during the late-season for pollinators in a dryland, agrivoltaic ecosystem. *Scientific Reports*, 11(7452). <https://doi.org/10.1038/s41598-021-86756-4>
- IMPLAN Group LLC. (2025). Huntersville, NC. implan.com
- Kozak, M., & Pudelfko, R. (2021). Impact Assessment of the Long-Term Fallowed Land on Agricultural Soils and the Possibility of Their Return to Agriculture. *Agriculture*, 11(2), 148. <https://doi.org/10.3390/agriculture11020148>
- National Renewable Energy Laboratory. (n.d.). *Solar Resource Glossary*. Grid Modernization. <https://www.nrel.gov/grid/solar-resource/solar-glossary.html#content>
- Office of the Federal Register, National Archives and Records Administration & U.S. Government Publishing. (1978, January 31). 7 CFR Part 657 - *Prime and Unique Farmlands*. <https://www.ecfr.gov/current/title-7/subtitle-B/chapter-VI/subchapter-F/part-657>
- Parker, G.E., & Green, L. (Eds.). (2014). Biodiversity Guidance for Solar Developments. *BRE National Solar Centre*. <https://www.bre.co.uk/filelibrary/nsc/Documents%20Library/NSC%20Publications/National-Solar-Centre---Biodiversity-Guidance-for-Solar-Developments--2014-.pdf>
- Sengupta, M., Xie, Y., Lopez, A., Habte, A., Maclaurin, G., & Shelby, J. (2018, March 19). The National Solar Radiation Data Base (NSRDB). *Renewable and Sustainable Energy Reviews*. <https://www.sciencedirect.com/science/article/pii/S136403211830087X?via%3Dihub>
- U.S. Department of Energy. (2022). *Farmer's Guide to Going Solar*. Office of Energy Efficiency & Renewable Energy. <https://www.energy.gov/eere/solar/farmers-guide-going-solar>
- U.S. Department of Homeland Security. (2024, March 10). *U.S. Electric Power Transmission Lines* [Data set]. GeoSpatial Management Office. <https://hifld-geoplatform.hub.arcgis.com/datasets/geoplatform::transmission-lines/about>
- U.S. Energy Information Administration (EIA). (2024, January). *Capital Cost and Performance Characteristics for Utility-Scale Electric Power Generating Technologies*. https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2025.pdf
- U.S. Energy Information Administration (EIA). (2024). *Monthly Generation Data by State, Producer Sector and Energy Source* [Data set]. Form EIA-923. <https://www.eia.gov/electricity/data/eia923/>
- United States Census Bureau. (2024). *QuickFacts*. <https://www.census.gov/>
- USDA Economic Research Service. (2025, January 28). *Oil Crops Yearbook*. <https://www.ers.usda.gov/data-products/oil-crops-yearbook>
- USDA Economic Research Service. (2025, March 12). *Feed Grains Database - Feed Grains Custom Query*. <https://data.ers.usda.gov/FEED-GRAINS-custom-query.aspx>
- USDA National Agricultural Statistics Service (NASS). (1994). *1992 Census of Agriculture*. https://agcensus.library.cornell.edu/census_year/1992-census/
- USDA National Agricultural Statistics Service (NASS). (1999). *1997 Census of Agriculture*. https://agcensus.library.cornell.edu/census_year/1997-census/
- USDA National Agricultural Statistics Service (NASS). (2004). *2002 Census of Agriculture*. https://agcensus.library.cornell.edu/census_year/2002-census/

USDA National Agricultural Statistics Service (NASS). (2009). *2007 Census of Agriculture*. https://agcensus.library.cornell.edu/census_year/2007-census/

USDA National Agricultural Statistics Service (NASS). (2014). *2012 Census of Agriculture*. https://agcensus.library.cornell.edu/census_year/2012-census/

USDA National Agricultural Statistics Service (NASS). (2019). *2017 Census of Agriculture*. <https://www.nass.usda.gov/Publications/AgCensus/2017/index.php>

USDA National Agricultural Statistics Service (NASS). (2024). *Quick Stats* [Data Set]. <https://quickstats.nass.usda.gov/>

USDA National Agricultural Statistics Service (NASS). (2024a). *Statistics by State* [Interactive Map]. https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/index.php

USDA National Agricultural Statistics Service (NASS). (2024b). *2022 Census of Agriculture*. <https://www.nass.usda.gov/Publications/AgCensus/2022/>

USDA National Agricultural Statistics Service (NASS). (2025). *Cropland Data Layer (CDL) - Spatial Agricultural Reference System (SARS)*. https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php

USDA National Agricultural Statistics Service (NASS). (2026). *Statistics by State* [Interactive Map]. https://www.nass.usda.gov/Statistics_by_State/index.php

USDA National Agricultural Statistics Service. (n.d.). *Field Crops. Charts and Maps*. https://www.nass.usda.gov/Charts_and_Maps/Field_Crops/index.php

USDA National Agricultural Statistics Service. (n.d.). *Soybeans Yield*. https://www.nass.usda.gov/Charts_and_Maps/graphics/soyyld.pdf

USDA Natural Resource Conservation Service & 2017 National Resources Inventory. (2021, February 24). *RCA Data Viewer | Natural Resources Conservation Service. Prime Farmland* [Data set]. https://publicdashboards.dl.usda.gov/t/FPAC_PUB/views/RCADVPrimeFarmlandNRI20171/StatePrimeFarmland?%3Adisplay_count=n&%3Aembed=y&%3AisGuestRedirectFromVizportal=y&%3Aorigin=viz_share_link&%3AshowAppBanner=false&%3AshowVizHome=n

USDA Natural Resources Conservation Service. (2020). *Summary Report: 2017 National Resources Inventory*. https://www.nrcs.usda.gov/sites/default/files/2022-10/2017NRI_Summary_Final.pdf

USDA Natural Resources Conservation Service. (2022). *User Guide for the National Commodity Crop Productivity Index (NCCPI) Version 3.0*. <https://www.nrcs.usda.gov/sites/default/files/2023-01/NCCPI-User-Guide.pdf>

USDA Natural Resources Conservation Service. (2025). *Web Soil Survey*. <https://websoilsurvey.sc.egov.usda.gov/app/>

USDA Natural Resources Conservation Service. (n.d.). *Web Soil Survey*. <https://www.nrcs.usda.gov/resources/data-and-reports/web-soil-survey>

USDA. (2024, November 21). *U.S. Electric Power Transmission Lines*. ArcGIS. <https://www.arcgis.com/home/item.html?id=d4090758322c4d32a4cd002ffaa0aa12#overview>

Walston, L.J., Mishra, S.K., Hartmann, H.M., Hlohowskyj, I., McCall, J., & Macknick, J. (2018, May 28). Examining the Potential for Agricultural Benefits from Pollinator Habitat at Solar Facilities in the United States. *Environmental Science & Technology*, 52(13). 7566-7576.

DAVID G. LOOMIS

Strategic Economic Research, LLC

*President***Education**

Doctor of Philosophy (PhD), Economics, Temple University, Philadelphia, Pennsylvania, May 1995

Bachelor of Arts (BA), Mathematics and Honors Economics, Temple University, Magna Cum Laude, May 1985

Experience

• **2011 – present, Strategic Economic Research, LLC**

- Supervises all aspects of analysis and report creation
- Performed over 500 economic impact analyses on policy initiatives and energy projects such as wind energy, solar energy, natural gas plants and transmission lines at the county and state level
- Provided expert testimony over 100 times in formal proceedings before state legislative bodies, state public utility commissions, and county boards regarding wind, solar and transmission projects
- Grew the company from a single employee to over 25 team members

• **1996 – 2023, Department of Economics at Illinois State University, Normal, IL**

Professor Emeritus – (2023 - present)

Full Professor – (2010 - 2023)

Associate Professor – (2002 - 2009)

Assistant Professor – (1996 - 2002)

- Taught Regulatory Economics; Telecommunications Economics and Public Policy; Industrial Organization and Pricing; Individual and Social Choice; Economics of Energy and Public Policy; and a Graduate Seminar Course in Electricity, Natural Gas, and Telecommunications Issues
- Supervised as many as five graduate students in research projects each semester
- Served on numerous departmental committees

• **1997 – 2023, Institute for Regulatory Policy Studies, Normal, IL**

Executive Director (2005 - 2023)

Co-Director (1997 - 2005)

- Grew contributing membership from five companies to 16 organizations
- Doubled the number of workshop/training events annually
- Supervised two directors, administrative staff and internship program
- Developed and implemented state-level workshops concerning regulatory issues related to the electric, natural gas, and telecommunications industries

• **2006 – 2018, Illinois Wind Working Group, Normal, IL**

Director

- Founded the organization and grew the organizing committee to over 200 key wind stakeholders
- Organized annual wind energy conference with over 400 attendees
- Organized strategic conferences to address critical wind energy issues
- Initiated monthly conference calls to stakeholders
- Devised organizational structure and bylaws

2007 – 2018, Center for Renewable Energy, Normal, IL

Director

- Created founding document approved by the Illinois State University Board of Trustees and Illinois Board of Higher Education
- Secured over \$150,000 in funding from private companies
- Hired and supervised four professional staff members and supervised three faculty members as Associate Directors
- Reviewed renewable energy manufacturing grant applications for Illinois Department of Commerce and Economic Opportunity for a \$30 million program
- Created technical “Due Diligence” documents for the Illinois Finance Authority loan program for wind farm projects in Illinois
- Published 40 articles in leading journals such as AIMS Energy, Renewable Energy, National Renewable Energy Laboratory Technical Report, Electricity Journal, Energy Economics, Energy Policy, and many others
- Raised over \$7.7 million in grants and over \$2.7 million in external funding

BRYAN A. LOOMIS

Strategic Economic Research, LLC
Vice President

Education

Master of Business Administration (MBA), Belmont University, Nashville, Tennessee, 2017

Experience

2019 – present, Strategic Economic Research, LLC

- Serves as lead analyst on economic impact reports, overseeing all aspects of analysis and report creation
- Communicates with developers about economic impact, property tax, and land use analyses
- Conducts non-standard analyses and memos for unique energy-related projects, such as statewide legislation, property tax impacts on school district state aid, and analyzing eligibility for energy community bonus adders to tax credits
- Oversees improvements to both reports and team processes

Expert Testimony

- Provides third-party expert testimony on behalf of developers for special-use permitting hearings, county board proceedings, and boards of zoning appeals (in seven states thus far)

Property Tax Analysis and Land Use Director (2019 - 2021)

- Directed the property tax analysis by training other associates on the methodology and overseeing the process for over twenty states
- Improved the property tax analysis methodology by researching various state taxing laws and implementing depreciation, taxing jurisdiction millage rates, and other factors into the tax analysis tool
- Executed land use analyses by running Monte Carlo simulations of expected future profits from farming and comparing that to the solar lease
- Performed economic impact modeling using JEDI and IMPLAN tools
- Improved workflow processes by capturing all tasks associated with economic modeling and report-writing, and created automated templates in Asana workplace management software

2019 – 2021, Viral Healthcare Founders LLC, Nashville, TN CEO and Founder

SAWYER KEITHLEY

Strategic Economic Research, LLC
Manager of Research & Analysis
Front Matter Team Lead

Education

Master of Science (MS) in Applied Economics, Sequence in Electricity, Natural Gas, and Telecommunications, Illinois State University, Normal, IL, 2024

Bachelor of Science (BS) in Managerial Economics, Minor in Business Administration, Magna Cum Laude, Illinois State University, Normal, IL, 2022

Experience

2021 – present Strategic Economic Research, LLC

- Use cost inputs from customers to forecast potential new employment, output, and earnings impacts created by the proposed energy project
- Lead a team to gather data, write, and edit narratives for county- or state-specific tables and graphs
- Compile project-specific information and research property tax information for the county of interest
- Designed and implemented a standardized land use reporting framework for project analysis, successfully quantifying and highlighting the net land use impacts of solar projects across agricultural and forestry sectors (cropland, pastureland, and timberland)

Expert Testimony

- Provided expert testimony in formal proceedings before county board and board of zoning appeals in Iroquois County, Illinois (July 2025)

June 2023 – August 2023, Nicor Gas, Rates Department

Rates Intern

- Conducted independent research to update the cost factors used by the company for feasibility studies and wrote a summary report for project findings
- Gathered historical and current information about the natural gas industry and analyzed patterns in legislation surrounding the future of natural gas



Strategic
Economic
Research, LLC

1604 Visa Drive Suite #1
Normal, IL 61761

strategiceconomic.com

815-905-2750

Economic Impact Analysis for the Mackinaw Solar Project

August 2026

Doral is developing the Mackinaw Solar Project (the Project) in Tazewell County, Illinois. The Mackinaw Solar Project is a 500-megawatt alternating current (MWac) utility-scale solar-powered electric generation facility that will utilize photovoltaic (PV) panels installed on a single-axis tracking system. The Project represents an investment of over \$600 million. The total development is anticipated to result in the following:

JOBS¹

-  610 new local jobs during construction for Tazewell County
-  1,313 new local jobs during construction for the State of Illinois
-  48.0 new local long-term jobs for Tazewell County
-  72.3 new local long-term jobs for the State of Illinois

EARNINGS²

-  Over \$67.0 million in new local earnings during construction for Tazewell County
-  Over \$142 million in new local earnings during construction for the State of Illinois
-  Over \$3.2 million in new local long-term earnings for Tazewell County annually
-  Over \$5.2 million in new local long-term earnings for the State of Illinois annually

OUTPUT³

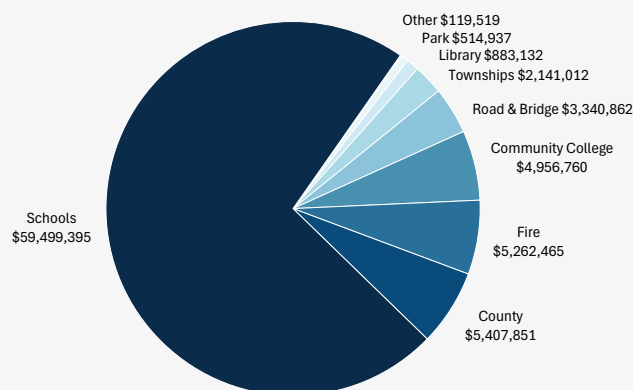
-  Over \$134 million in new local output during construction for Tazewell County
-  Over \$296 million in new local output during construction for the State of Illinois
-  Over \$8.4 million in new local long-term output for Tazewell County annually
-  Over \$14.4 million in new local long-term output for the State of Illinois annually

LOCAL TAXES

-  Over \$82.1 million in total local taxes for all taxing districts over the life of the Project



Total Local Taxes Paid by the Mackinaw Solar Project



¹ All job values are full-time equivalents (FTEs) and are the sum of the direct, indirect, and induced jobs during construction and annual operations which can be found in the first table.

² Earnings are a measurement in dollars of the total wages and benefits produced by the jobs found by the analysis. These earnings are categorized by construction impacts and operations impacts.

³ Output refers to economic activity or the value of production in the state or local economy. It is an equivalent measure to the Gross Domestic Product (GDP), which measures output on a national basis.

TOTALS

Total Employment Impacts from the Mackinaw Solar Project

	Tazewell County Jobs	State of Illinois Jobs
Construction		
Direct Impacts	305	564
Indirect Impacts	150	283
Induced Impacts	155	466
<i>Local Jobs during Construction</i>	610	1,313
Operations (Annual/Ongoing)		
Onsite Direct Impacts	3.9	7.9
Indirect Impacts	29.0	35.8
Induced Impacts	15.1	28.6
<i>Local Long-Term Jobs</i>	48.0	72.3

Total Earnings Impacts from the Mackinaw Solar Project

	Tazewell County	State of Illinois
Construction		
Direct Impacts	\$46,666,222	\$85,414,058
Indirect Impacts	\$12,923,174	\$27,667,523
Induced Impacts	\$7,463,406	\$29,882,681
<i>Local Earnings during Construction</i>	\$67,052,802	\$142,964,262
Operations (Annual/Ongoing)		
Onsite Direct Impacts	\$494,153	\$988,306
Indirect Impacts	\$1,982,173	\$2,579,896
Induced Impacts	\$739,904	\$1,715,567
<i>Local Long-Term Earnings</i>	\$3,216,230	\$5,283,769

Total Output Impacts from the Mackinaw Solar Project

	Tazewell County	State of Illinois
Construction		
Direct Impacts	\$74,210,906	\$138,516,436
Indirect Impacts	\$31,891,885	\$62,953,897
Induced Impacts	\$27,941,494	\$94,871,313
<i>Local Output during Construction</i>	\$134,044,285	\$296,341,646
Operations (Annual/Ongoing)		
Onsite Direct Impacts	\$2,099,754	\$3,665,703
Indirect Impacts	\$3,590,756	\$5,083,999
Induced Impacts	\$2,749,151	\$5,678,107
<i>Local Long-Term Output</i>	\$8,439,661	\$14,427,809

The property tax analysis below was based on the expected Project nameplate capacity, as well as the tax rates for Tazewell County. All tax rates are assumed to stay constant, with an assumed project life of 30 years. Fair cash value, trending factors, and depreciation were calculated in accordance with Illinois law. No comprehensive tax payment was calculated, and these calculations are only to be used to illustrate the potential economic impact of the Project.

Total Local Taxes Paid by the Mackinaw Solar Project

Tax Year	Total Local Taxes
2030	\$4,028,634
2031	\$3,960,308
2032	\$3,886,383
2033	\$3,806,627
2034	\$3,720,805
2035	\$3,628,671
2036	\$3,529,971
2037	\$3,424,444
2038	\$3,311,817
2039	\$3,191,813
2040	\$3,064,140
2041	\$2,928,501
2042	\$2,784,586
2043	\$2,632,076
2044	\$2,470,642
2045	\$2,299,944
2046	\$2,119,628
2047	\$1,929,332
2048	\$1,852,159
2049	\$1,896,611
2050	\$1,942,130
2051	\$1,988,741
2052	\$2,036,471
2053	\$2,085,346
2054	\$2,135,394
2055	\$2,186,644
2056	\$2,239,123
2057	\$2,292,862
2058	\$2,347,891
2059	\$2,404,240
TOTAL	\$82,125,935
AVG ANNUAL	\$2,737,531

Exhibit X
Avoided Pollution Report



MACKINAW SOLAR
500 MW SOLAR PROJECT
TAZEWELL COUNTY, ILLINOIS

Avoided Pollution, Public Health, Ecosystem and Economic Impact Report

August 2026

Dr. Daniel Howard
Matt Maher Peterson



Authors



Dr. Daniel Howard

Dr. Daniel Howard is a seasoned energy analyst with extensive experience in environmental impact assessment and energy systems modeling. As the lead researcher at Quantum Energy, he has directed numerous projects on the integration of renewable energy sources into existing grids. Daniel holds a Ph.D. in Environmental Engineering, and his work focuses on leveraging advanced simulation platforms to evaluate the public health and ecosystem benefits of sustainable energy projects. Daniel has been a research fellow for the National Science Foundation, United States Environmental Protection Agency, and United States Agency for International Development. His work has been instrumental in informing policy and guiding the development of sustainable energy infrastructure.



Matt Maher Peterson

Matt Maher Peterson is the Chief Technology Officer at Quantum Energy where he leads the software development of innovative energy analysis tools. Matt has 10+ years of experience leading the development of sustainability-focused analytics platforms and is the named inventor for three patents in the energy and resource management space, including U.S. Patent Numbers 11595076, 10564802, and 11169657. He has a strong background in physics and mathematics, with degrees from Western Washington University. His dedication to advancing sustainable energy solutions is reflected in his leadership and numerous successful projects in the field.

Table of Contents

04	Executive Summary
04	Overview of Quantum Energy and TotalView Impact Analytics
05	Overview of Mackinaw Solar Project Impact Analytics Assessment
06	Introduction
08	Methodology
09	Analysis Scope: Operational Impacts
10	Step 1: Grid Simulation
11	Step 2: Emissions Inventory
12	Emissions to Air
13	Emissions to Water
13	Emissions to Soil
13	Resource Use
14	Step 3: Impact Assessment
15	Impact Pathway Descriptions
16	Project: Mackinaw Solar
17	Results
17	Generation Changes
18	Avoided Emissions
21	Public Health Impacts
22	Ecosystem Impacts
23	Economic Impacts
24	Lifetime Projections
25	Conclusion
27	Glossary & Methodology Notes
28	Data Sources & Key Assumptions



EXECUTIVE SUMMARY

Expected Impacts from Integrating Mackinaw Solar into the PJM Balancing Authority

Mackinaw Solar LLC, a subsidiary of Doral Renewables LLC (“Doral”), is developing the Mackinaw Solar Project (“Project”) in Tazewell County, Illinois and engaged Quantum Energy (“Quantum”) to evaluate the potential grid-level emissions reductions and corresponding public health, ecosystem, and economic impacts to aid decision-makers and stakeholders in their evaluation of the environmental and other merits of the proposed Project. This report is a comprehensive assessment of the expected impacts from integrating Mackinaw Solar into the PJM balancing authority.

Overview of Quantum Energy and TotalView Impact Analytics

The TotalView Energy Platform™ (“TotalView”) is a new impact analytics platform developed by Quantum Energy, an energy analytics software firm, and funded by the National Science Foundation. TotalView is compliant

with ISO 14040 and 14044 principles, and is a novel automated quantification tool that can provide a suite of comprehensive impact analytics for

utility-scale energy projects to enable optimized decision-making for project siting, procurement, and investment decisions as well as for other portfolio management purposes, such as voluntary or compliance-based ESG reporting.

The platform quantifies the avoided grid-level emissions and public health, ecosystem and economic benefits caused by an existing or proposed renewable energy project. It is the world's first analytics platform to integrate energy system optimization and life cycle assessments and is differentiated from other carbon accounting platforms by considering many other avoided externalities (e.g. particulate matter emissions) beyond carbon emissions.

The simulation model is technology, megawattage and locationally specific and is compliant with ISO 14040 and 14044 principles. The platform also includes an automated data integration pipeline that retrieves all required data for electric grid simulations from data reported to the U.S. Energy Information Administration databases, checks this data for completeness and consistency, and then stores it in a data warehouse. The impact analytics directly map to leading sustainability reporting regulations such as the Corporate Sustainability Reporting Directive section ESRS E2.

Overview of Mackinaw Solar Project Impact Analytics Assessment

Using the TotalView Energy Platform, Quantum Energy's analysis simulates hourly grid-level changes in generation and air pollutant emissions. These simulations were validated against data from the U.S. Energy Information Administration to ensure accuracy. Public health, ecosystem, and economic impacts were estimated using reliable life cycle impact assessment methodologies and datasets.

In its first year of operation, Mackinaw Solar is projected to generate approximately 1,080 GWh of electricity.

This will lead to significant emissions reductions in Year 1, estimated to save 943 disability-adjusted life years and preserve over 2.11 potentially disappeared fractions of species, resulting in approximately \$257 million in economic gains in addition to the direct, indirect, and induced economic benefits.

The Project has an estimated 30-year operational lifetime, of which TotalView conservatively modeled the first 25 years. Over this 25-year modeling period, Mackinaw Solar is projected to save approximately 22,200 disability-adjusted life years, preserve 49.7 potentially disappeared fractions of species, and deliver approximately \$4.38 billion in cumulative economic benefits (NPV).

This report presents results using an Operational analysis scope compliant with ISO 14040 and 14044 principles, quantifying the hourly displacement of fossil fuel generation within the PJM balancing authority and the pollution, public health, ecosystem, and economic consequences of that displacement. Quantum also performed a companion cradle-to-grave analysis of the Project, which additionally includes manufacturing, construction, and end-of-life impacts; those results are available upon request. The operational scope is presented here because it isolates the local and regional impacts most relevant to the communities and regulators evaluating the Project. Impacts are quantified using the ReCiPe 2016 impact assessment method. Lifetime projections cover the first 25 years of the Project's estimated 30-year lifetime, with technology-specific annual degradation of 0.5%. Economic lifetime values are discounted at a 3% social discount rate (NPV).

The scope of this report evaluates the broader impacts and benefits of the project and does not address site specific mitigation

or adaptation efforts. Doral's evaluation of and plans for vegetative and ecosystem management efforts are additive to the broader benefits assessed herein.

The analysis shows that the solar project will lead to substantial reductions in both local and global air pollutants. Local benefits include reductions in particulate matter, human toxicity emissions, and photochemical oxidants, which will improve air quality and health outcomes for communities surrounding Mackinaw Solar and within the PJM balancing authority. Global benefits primarily stem from reductions in carbon emissions. While there is not a coal or natural gas plant immediately adjacent to the Project, the region has a substantial fossil fuel generation fleet. Cumulatively, fossil fuel combustion accounts for approximately 31.8% of Illinois's total electricity generation,¹ and coal and natural gas together represent approximately 58.7% of the generation mix in the PJM balancing authority. Therefore, there is substantial potential for the reduction in air pollutants as a result of Mackinaw Solar becoming operational.

In conclusion, the Mackinaw Solar project offers a substantial net positive outcome for public health, ecosystem quality, and the economy in year one and cumulatively through the project's life span, benefiting Tazewell County, the State of Illinois, and beyond.

1 U.S. Energy Information Administration <https://www.eia.gov/state/?sid=IL>



INTRODUCTION

A Broader Picture of Clean Energy Impacts

As environmental challenges intensify and the need for sustainable energy solutions grows, the development of renewable energy projects plays a central role in addressing these issues. However, the development of renewable energy projects is difficult, with over 80% facing significant delays or outright failure.² Despite these challenges, the transition to safe, affordable and reliable renewable energy is essential, especially for mitigating grid-level emissions and their associated impacts on public health, ecosystems, and the economy.

² Susskind, L., Chun, J., Gant, A., Hodgkins, C., Cohen, J., & Lohmar, S. (2022). Sources of opposition to renewable energy projects in the United States. *Energy Policy*, 165, 112922.

Environmental Impact Statements (EISs) for renewable energy projects typically focus on site-specific impacts like land use changes and effects on wildlife habitats. While these assessments are important, they often overlook the broader implications of integrating renewable energy into the grid. This oversight can obscure the significant public health and ecosystem benefits that arise from emissions reductions at a regional and national scale.

For Mackinaw Solar, potential site-specific impacts include temporary disturbances to local ecosystems and visual changes to the landscape. These concerns must be reasonably addressed, but it is also vital to consider the substantial public health and ecosystem benefits caused by emissions reductions. By displacing fossil fuel-based electricity generation, solar energy can significantly reduce greenhouse gas and air pollutant emissions, leading to measurable positive impacts on public health and ecosystem resilience.

Illinois presents a particularly relevant context for this assessment. While nuclear generation supplies over half of the state's electricity, the state retains a substantial fossil fuel fleet: fossil fuel-fired power plants collectively account for approximately 31.8% of Illinois's total electricity generation.³ As these combustion-based generators are displaced by Mackinaw Solar on an hourly basis, the resulting reductions in air pollutant emissions—including particulate matter, human toxicity, photochemical oxidants, and CO₂—translate directly into measurable public health and ecosystem benefits for communities across the state and the broader PJM balancing authority.

Fossil fuel combustion for electricity generation emits pollutants that contribute to serious health issues, including respiratory diseases, cardiovascular ailments, cancer, and premature mortality. A recent Harvard study highlighted that particulate matter emissions from fossil fuel combustion cause approxi-

mately 355,000 deaths annually in the U.S., which is approximately 1 in 8 deaths nationwide.⁴

The adoption of solar energy through projects like Mackinaw Solar has the potential to significantly improve air quality and public health outcomes by reducing harmful greenhouse gas and air pollutant emissions. The health benefits of improved air quality extend far beyond the immediate vicinity of the project, providing substantial gains to the region and society at large.

Additionally, the ecological benefits of reduced emissions are substantial. Emissions from fossil fuels contribute to acid deposition and eutrophication, which degrade soil quality and aquatic ecosystems, leading to biodiversity loss and impaired ecosystem services. The shift to clean energy sources, which have negligible operational emissions, helps mitigate these stressors, supporting ecosystem resilience and preserving natural habitats over the lifespan of the project.

This report expands conventional EISs by examining the potential grid-level emissions reductions attributable to Mackinaw Solar. Through highly accurate simulations and comprehensive impact assessments, this study quantifies the anticipated emissions reductions and evaluates their impacts on public health, ecosystems, and the economy.

This Report is Organized into Five Sections for Clarity and Coherence

1. The **Introduction** offers an overview of the current state of renewable energy projects and their impacts.
2. The **Methodology** section details the modeling platform, the analytical approaches used, and the operational analysis scope applied in this report.
3. The **Project** section provides a concise overview of Mackinaw Solar, including its objectives and scope.

4. The **Results** section presents the forecasted avoided emissions and the public health, ecosystem, and economic benefits of Mackinaw Solar.

5. The **Conclusions** section summarizes the key findings and discusses the significant takeaways from the analysis.

While recognizing the importance of site-specific environmental assessments, this report emphasizes the broader benefits of renewable energy initiatives. It advocates for a more holistic approach to environmental impact assessments in the renewable energy sector.

By integrating these broader considerations, this report aims to provide a balanced and comprehensive perspective that assesses the value of renewable energy projects like Mackinaw Solar in achieving a sustainable and healthier future.

³ U.S. Energy Information Administration <https://www.eia.gov/state/?sid=IL>

⁴ Vohra, K., Vodonos, A., Schwartz, J., Marais, E. A., Sulprizio, M. P., & Mickley, L. J. (2021). Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem. *Environmental Research*, 195, 110754.

METHODOLOGY

Energy System Optimization and Impact Assessment

TOTALVIEW ENERGY PLATFORM

Three-module Architecture



Grid Simulation

FUNCTION

Simulates hourly generation

OUTPUT

Changes to hourly generation



Emissions Inventory

FUNCTION

Quantifies emissions to air, soil, and water

OUTPUT

Changes to hourly emissions by impact category



Impact Assessment

FUNCTION

Calculates impacts

OUTPUT

Changes to public health, ecosystem and economic impacts

The platform utilized for this analysis is Quantum’s TotalView Energy Platform (TotalView), funded by the National Science Foundation Energy Technologies Portfolio, under Award Number 2230578. TotalView is an electricity grid simulation and life cycle impact assessment platform. The model simulates hourly electricity grid interaction on an hourly basis using historical operation data, as well as grid-level emissions and corresponding public health, ecosystem and economic impacts of those grid-level emissions. This analysis uses the industry-standard ReCiPe 2016 LCIA methodology, one of the most widely adopted life cycle impact assessment methods globally and recommended by multiple governmental and international bodies for comprehensive environmental impact assessment.

METHODOLOGY

Analysis Scope: Operational Impacts

This report presents an **Operational** analysis scope. The operational scope quantifies the impacts of the operating electricity system: the hourly displacement of fossil fuel generation within the PJM balancing authority caused by the Project, and the avoided pollution, public health, ecosystem, and economic damages associated with that displaced generation. Manufacturing, construction, and end-of-life impacts—which occur predominantly outside the region, across global supply chains—are excluded from the results presented in this report.

Quantum also performed a full Cradle-to-Grave (CTG) analysis of the Project, covering raw material extraction, manufacturing, transportation, installation, operation, and end-of-life of both the renewable energy

system and the displaced fossil fuel generation. That companion analysis, which likewise shows substantial net benefits, is available from Quantum Energy upon request. Both analyses are quantified using assessment methodology compliant with ISO 14040 and 14044 principles, which require the system boundary to be defined consistent with the goal of the study.

The operational scope is presented here because the question before the communities, regulators, and decision-makers evaluating the Project is what changes in their region when the Project operates: the air quality of the regional airshed, the health of local and regional populations, the condition of local ecosystems, and the economic value of those changes. A cradle-to-grave boundary

aggregates these regional operational impacts with impacts from mining and manufacturing that occur largely in other states and countries. Those global supply-chain impacts are real and are appropriately captured in corporate footprinting and product-level accounting, but combining them with regional operational impacts obscures the local and regional picture that communities and regulators are most interested in. The operational scope isolates the impacts that occur because of the Project's interaction with the regional grid, so that every avoided tonne of pollution presented in this report is attributable to displaced combustion within the PJM balancing authority and its fuel supply.





METHODOLOGY
STEP 1

Grid Simulation

The Grid Simulation module simulates hourly generation for a given balancing authority using data from the U.S. Energy Information Administration (EIA) 930 database for the most recent complete year. The results are then checked for congruency with the reported generation in the EIA database.

After the TotalView simulation results have been checked for congruency, the counterfactual scenario is modeled. The new energy project under consideration is added into the

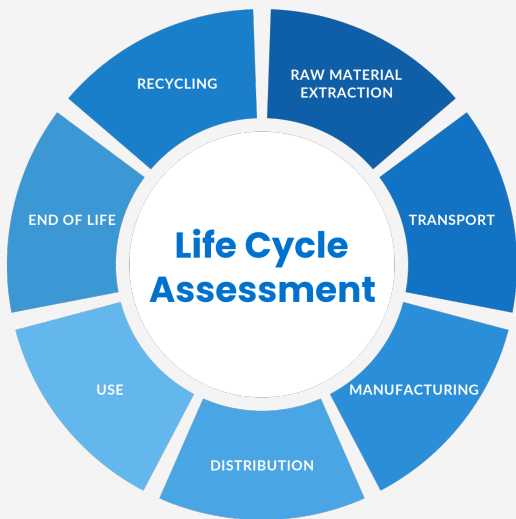
grid mix and the model is re-run to analyze the changes in generation and grid dynamics each hour based on the hourly forecasted generation of the project, known as the

8760 profile, provided by the project developer.

METHODOLOGY
STEP 2

Emissions Inventory

As the generation changes are being quantified, the emissions module performs an emissions inventory to simulate system-level changes to emissions and resource use. The emissions inventory draws on the life cycle impact assessment framework, which can evaluate emissions and resource use across the entire life cycle of a technology. Consistent with the operational analysis scope of this report, the inventory presented herein is bounded to the operational phase of the electricity system: the operation of the Project and the displaced fossil fuel generation, including the fuel supply of that displaced generation.



The industry leading life cycle impact assessment method for electricity production, ReCiPe 2016,⁵ is utilized in the TotalView Energy Platform. In the first step, a baseline grid-level emissions inventory is assessed, and then in the second step the changes to grid-level emissions and resource depletion are assessed due to a new project being added to the grid. The changes in emissions and resource use are then quantified in each of the standard impact categories and grouped into emissions to air, water, and soil. The full life cycle stages shown in the figure are evaluated in Quantum’s companion cradle-to-grave analysis, available upon request; the results in this report reflect the use stage of the electricity system.

5 Rybaczewska-Błażejowska, M., & Jezierski, D. (2024). Comparison of ReCiPe 2016, ILCD 2011, CML-IA baseline and IMPACT 2002+ LCIA methods: a case study based on the electricity consumption mix in Europe. The International Journal of Life Cycle Assessment, 29(10), 1799-1817.

STANDARD REPORTING METRICS

Avoided Emissions and Resource Use



Emissions to Air

Air pollutants that increase air quality concentrations, leading to human exposure and public health impacts



Emissions to Water

Pollutants that increase freshwater or marine pollutant concentrations, leading to freshwater or marine ecosystem quality impacts



Emissions to Soil

Pollutants that increase soil pollutant concentrations, leading to terrestrial ecosystem impacts



Resource Use

Metals, minerals, land, and water used in the operation of the electricity system

Emissions to Air

The emissions to air include the following impact categories.

Climate Change

Emissions of greenhouse gasses (GHGs) that lead to an increased atmospheric concentration of GHGs.

Particulate Matter

A complex mixture of organic and inorganic substances with a diameter of less than 2.5 µm. This includes primary PM2.5 aerosols as well as secondary PM2.5 aerosols formed from emissions of sulfur dioxide (SO₂), ammonia (NH₃), nitrogen oxides (NO_x) and other elements.

Human Toxicity

Carcinogenic and non-carcinogenic substances that have human toxicological effects via human exposure by air, drinking water or accumulation in the human food chain. These substances include benzene emissions, which cause blood disorders, neurological issues, reproductive issues, immune system disorders, leukemia and other cancers.⁶

⁶ United States Environmental Protection Agency, 2012. <https://www.epa.gov/sites/default/files/2016-09/documents/benzene.pdf>

Photochemical Oxidants

Primary and secondary aerosols formed as a result of photochemical reactions of NO_x and non-methane volatile organic compounds (NMVOCs) that cause respiratory illness and even death.

Ionizing Radiation

Radionuclides emitted into the air that cause ionizing radiation, leading to damaged DNA molecules.

Ozone Depletion

Ozone depleting substances that have chlorine or bromine groups in their molecules that interact with ozone in the stratosphere, leading to damage to human health as a result of increased UVB-radiation.

Emissions to Water

The emissions to water include the following impact categories:

Freshwater Ecotoxicity

Chemicals emitted into the environment that have ecotoxicological effects and are transported to freshwater ecosystems.

Marine Ecotoxicity

Chemicals emitted into the environment that have ecotoxicological effects and are transported to marine ecosystems.

Freshwater Eutrophication

Nutrient emissions, such as phosphorus and nitrogen, transported to freshwater ecosystems that increase nutrient uptake by organisms and species and lead to relative loss of species.

Marine Eutrophication

Nutrient emissions, such as phosphorus and nitrogen, transported to marine ecosystems that increase nutrient uptake by organisms and species and lead to relative loss of species.

Emissions to Soil

The emissions to soil include the following impact categories:

Terrestrial Acidification

Inorganic substances, nitrogen oxides (NO_x), ammonia (NH₃) and sulfur dioxide (SO₂), that are transported to soil and cause a change in acidity and affect terrestrial species.

Terrestrial Ecotoxicity

Chemicals emitted into the environment that have ecotoxicological effects and are transported to terrestrial ecosystems.

Resource Use

Resource use is also typically considered in impact assessment, including the following impact categories:

Non-renewable Energy Resources

Assessment of increases in fossil fuel extraction causing increases in extraction costs due to a change in production technique or to sourcing from a costlier location.

Land Use

Assessment of relative species impact, whether loss or avoided loss, due to land use locally and globally including land transformation, land occupation and land relaxation based on change of land cover and the new use of the land.

Material Resources

Assessment of increases in extraction of a mineral resource leading to an overall decrease in ore grade, causing an increase in ore production costs for mineral extraction.

METHODOLOGY
STEP 3

Impact Assessment

After the changes to emissions are quantified in each impact category, the changes to emissions are mapped down epidemiological and ecosystem impact pathways to assess impacts to human health as well as ecosystem quality and biodiversity. These impacts are assessed using the widely accepted ReCiPe 2016 methodology.

Public health impacts are quantified in terms of disability-adjusted life years (DALYs). A DALY is a time-based measure and standard metric used by the World Health Organization to assess the overall burden of disease borne by individuals in different populations. “One DALY represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost due to premature mortality (YLLs) and the years lived with a disability (YLDs) due to prevalent cases of the disease or health condition in a population.”⁷

Ecosystem impacts are quantified in terms of potentially disappeared fraction of species (PDF). A PDF is the standard unit of measurement in life cycle impact assessment for measuring ecosystem quality impacts. A PDF “reflects the potential extinction of species, within a specific time associated with resource uses or emissions, which are leading to habitat losses or degradation.”⁸

As a final step, health economics, and natural resource economics are applied to financially value the costs or benefits of these changes to emissions and impacts on the economy.⁹ The economic impacts presented in this study are in addition to the direct, indirect and induced economic benefits that the project is expected to achieve through construction spending, local employment, and tax revenues.

Impact Pathway Descriptions

Particulate matter has been traced to 355,000 deaths per year in the United States, which equates to approximately 1 in 8 deaths in the U.S. The following section describes the steps involved with the particulate matter impact pathway in language that is intended for a general audience.

Let’s consider a clean energy project that is developed in Illinois. Each hour that the project produces electricity, the electricity will be delivered to the PJM balancing authority. That clean electricity will offset electricity that would have otherwise been needed from other generators in the PJM balancing authority, such as from natural gas or coal generators. This, in turn, reduces emissions each hour that combustion-based electricity sources are offset.

The TotalView Energy Platform simulates these hourly changes to the grid-level generation, including taking into account patterns of curtailment, and uses highly accurate predictive analytics to determine the reduction in emissions caused by the clean energy project. Then, using the industry standard life cycle impact assessment methodologies, the following steps are performed:

Step 1

The reductions in emissions are mapped to reductions in air quality concentrations of air pollutants.

Step 2

The reductions in air quality concentrations are mapped to reductions in human exposure.

Steps 3 & 4

The reductions in human exposure are then mapped to changes in disease incidence using epidemiological exposure-response functions,¹⁰ including asthma, lower respiratory infections, lung cancer, ischemic heart disease, cerebrovascular disease and cardiopulmonary disease, which result in lower hospital admissions and premature mortality.

Step 5

Industry-standard health economics and natural resource economics are applied to financially value the changes in disease incidence.

7 World Health Organization, Global Health Observatory, 2024. <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/158>

8 International Corporate Governance Framework Biodiversity Action Toolkit, 2023.

9 United States Environmental Protection Agency, 2024. <https://www.epa.gov/environmental-economics/mortality-risk-valuation>

10 Cohen, A. J., Brauer, M., et al. (2017). Estimates and 25-year trends of the global burden of disease attributable to ambient air pollution. *The Lancet*, 389(10082), 1907-1918.

EMISSIONS TO AIR

Particulate Matter Impacts

Reductions in Emissions
NO_x, NH₃, SO₂, or PM

Atmospheric Fate and Chemistry

Reduced Human PM Intake

Exposure-Response Functions

Reduced Hospital Admissions

Reduced Premature Deaths

Public Health Savings

EMISSIONS TO SOIL

Terrestrial Acidification Impacts

Changes in Emissions
NO_x, NH₃, or SO₂

Atmospheric Fate and Chemistry

Atmospheric Deposition

Changes in Soil Concentration of H⁺

Changes in Plant Species Extirpation

Impacts to Terrestrial Ecosystems

EMISSIONS TO WATER

Freshwater Ecotoxicity Impacts

Changes in Emission of a Chemical

Atmospheric Fate and Chemistry

Changes in Chemical Composition in Environment

Changes in Species Exposure to Chemical

Changes in Freshwater Species Extirpation

Impacts to Freshwater Ecosystems

RESOURCE USE

Land Use

Land Use

Change of Land Cover

Loss of Habitat

Changes in Terrestrial Species Extirpation

Impacts to Terrestrial Ecosystems

Land Use Intensification

Soil Disturbance

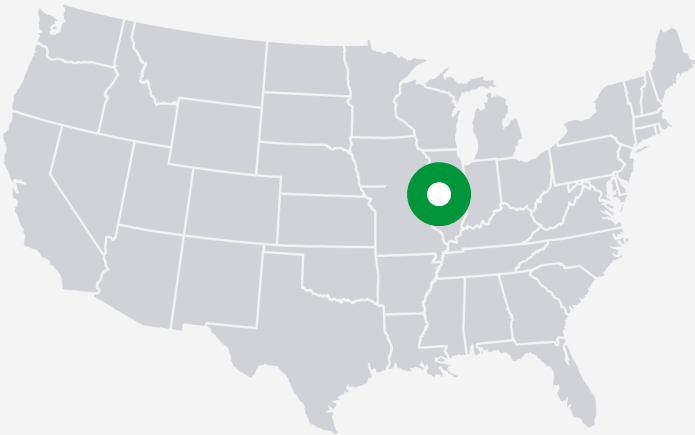
PROJECT

Mackinaw Solar

The proposed Mackinaw Solar project is a 500 MW ground-mount solar installation located in Tazewell County, Illinois. The project is set to interconnect with the PJM balancing authority.

500 MW SOLAR SYSTEM

Mackinaw Solar



Project Detail	Value
Technology	Ground-mount Solar PV
Capacity	500 MW
Annual Generation (Year 1)	1,080 GWh
Capacity Factor	24.6%
Location	Tazewell County, Illinois
Coordinates	40.5414, -89.6780
Balancing Authority	PJM
Estimated Project Lifetime	30 years (25 years modeled)
Analysis Scope	Operational
Generation Profile Source	Developer Supplied

The TotalView Energy Platform was utilized to simulate the forecasted generation changes, emissions changes and corresponding public health, ecosystem and economic impact estimated to be achieved by the first year of operation of Mackinaw Solar. Year 1 results are based on the most recent complete year of EIA grid data.

The Project has an estimated operational lifetime of 30 years, of which TotalView conservatively modeled the first 25 years. Projections over this 25-year modeling period are derived by applying a technology-specific annual degradation rate of 0.5% to account for the gradual decline in solar panel efficiency over time. Economic lifetime values are discounted at a 3% social discount rate to calculate net present value (NPV), consistent with standard practice for social cost-benefit analysis of infrastructure projects. As the PJM grid mix of generation sources evolves, the specific generators displaced by Mackinaw Solar may change, but the project's continued displacement of fossil fuel generation ensures substantial net benefits for public health, ecosystem health and economic impacts throughout its operational life.

RESULTS

Mackinaw Solar First Year Avoided Pollution and Impacts

The forecasted generation changes, avoided emissions and corresponding public health, ecosystem and economic impacts caused by the first year of operation of Mackinaw Solar are presented below.

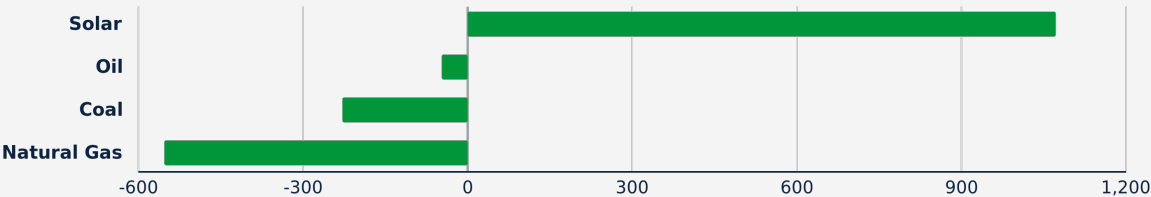
Generation Changes

In its first year, the Mackinaw Solar project is projected to generate approximately 1,080 GWh. The following table presents the forecasted first year changes to the PJM power system caused by Mackinaw Solar.

Solar generation increases with Mackinaw Solar, resulting in an estimated reduction of **552 GWh** in natural gas generation, a reduction of **228 GWh** in coal generation, and a reduction of **47 GWh** in oil-fired generation.

PJM POWER SYSTEM

Annual Changes with Mackinaw Solar



Generation Fuel Type	Historical PJM Generation (GWh)	Net Change with Mackinaw (GWh)
Natural Gas	365,580	(552)
Nuclear	270,085	0
Coal	145,346	(228)
Wind	31,972	0
Solar	24,643	1,072
Hydro	15,470	0
Other	12,597	0
Oil	5,333	(47)

Displaced generation values are rounded down to the nearest GWh.



RESULTS

Avoided Emissions

The avoided emissions across the impact categories for the first year are summarized below. The integration of Mackinaw Solar into the PJM power system is expected to reduce reliance on coal, natural gas, and oil generation, leading to substantial greenhouse gas and air pollutant emissions reductions.

It is important to note that two of the impact categories are related to global air pollutants, climate change and ozone depletion. The other six impact categories are related to local air pollutants.

The Mackinaw Solar project is primarily offsetting natural gas and coal generation because natural gas and coal make up a large portion of the PJM generation mix, with additional displacement of oil-fired peaking generation. There is very little renewable energy curtailment in PJM because wind and solar energy is currently a small portion of the PJM grid mix, so it is not likely that Mackinaw Solar will offset wind or solar generation. Nuclear generation is a substantial portion of the PJM grid mix, but nuclear energy is not cycled in response to variable renewable output, so there are no expected changes to nuclear energy. Bioenergy is lim-

ited and expensive, and currently a very small portion of the PJM grid mix, so no significant changes are expected there as well.

By modeling the hourly grid generation changes based on the forecasted hourly Mackinaw Solar production, we can see with more granularity the expected generation that will be displaced, and thus have a much more accurate assessment of the amount of greenhouse gas and air pollutant emissions that will be reduced. The emissions inventory utilized in TotalView considers all greenhouse gasses emitted by the displaced generation and its fuel supply, rather than just CO₂, which makes for a more accurate and more comprehensive CO₂-eq reduction assessment.

Under the operational analysis scope of this report, every impact category shows a net reduction, because the results isolate the

avoided pollution from displaced fossil fuel combustion and its fuel supply within the region. Impacts associated with manufacturing the project infrastructure—such as the ecotoxicity burdens of solar panel production, which occur predominantly outside the region—are excluded from this scope and are quantified in Quantum's companion cradle-to-grave analysis, available upon request.

Further, this assessment does not evaluate site-specific land use practices or local hydrological changes at the project site. The avoided land use presented in the resource use results reflects reductions in the land disturbance associated with coal and natural gas extraction as fossil generation is displaced. The developer's site-specific ecosystem management and mitigation planning is additive to the broader benefits assessed herein.

YEAR ONE & 25-YEAR

Avoided Emissions to Air

Area of Impact	Units	Year 1	25-yr
Climate Change	Tonnes CO ₂ -Eq	570,000	13,400,000
Human Toxicity (Cancerous)	Tonnes 1,4-DCB-Eq	26,100	614,000
Human Toxicity (Non-cancerous)	Tonnes 1,4-DCB-Eq	271,000	6,380,000
Ionising Radiation	MBq Co-60-Eq	145	3,420
Ozone Depletion	Tonnes CFC-11-Eq	0.147	3.46
Particulate Matter	Tonnes PM _{2.5} -Eq	417	9,820
Photochemical Oxidants (Public Health)	Tonnes NO _x -Eq	747	17,600
Photochemical Oxidants (Ecosystems)	Tonnes NO _x -Eq	789	18,600

Positive numbers are emissions reductions. All values reflect the operational analysis scope. 25-yr values reflect the 25-year modeling period of the Project's estimated 30-year lifetime.

YEAR ONE & 25-YEAR

Avoided Emissions to Water

Area of Impact	Units	Year 1	25-yr
Freshwater Ecotoxicity	Tonnes 1,4-DCB-Eq	7,060	166,000
Marine Ecotoxicity	Tonnes 1,4-DCB-Eq	9,710	229,000
Freshwater Eutrophication	Tonnes P-Eq	124	2,920
Marine Eutrophication	Tonnes N-Eq	11	259

YEAR ONE & 25-YEAR

Avoided Emissions to Soil

Area of Impact	Units	Year 1	25-yr
Terrestrial Acidification	Tonnes SO ₂ -Eq	1,310	30,900
Terrestrial Ecotoxicity	Tonnes 1,4-DCB-Eq	322,000	7,580,000

YEAR ONE & 25-YEAR

Avoided Resource Use

Area of Impact	Units	Year 1	25-yr
Land Use	Annual m ² crop-Eq	2,930,000	69,000,000
Water Use	Cubic Meters	1,050,000	24,700,000
Energy Resources: Non-Renewable, Fossil	Tonnes Oil-Eq	164,000	3,860,000
Material Resources: Metals/Minerals	Tonnes Cu-Eq	494	11,600

Positive numbers are emissions and resource use reductions. Under the operational analysis scope all impact categories show net reductions; manufacturing-phase impacts are excluded from this scope and are quantified in the companion cradle-to-grave analysis, available upon request. 25-yr values reflect the 25-year modeling period of the Project's estimated 30-year lifetime.

RESULTS

Public Health Impacts

The following figure presents the public health impacts forecasted to be caused by the emissions reductions that Mackinaw Solar is expected to achieve in Year 1. It is estimated that in the first year of Mackinaw Solar operation, **943 disability-adjusted life years will be saved** due to the reductions of global air pollutants like CO₂ as well as local air pollutants like particulate matter and human toxicity emissions. This is equivalent to approximately 470 people getting an extra two years of healthy life with their families.

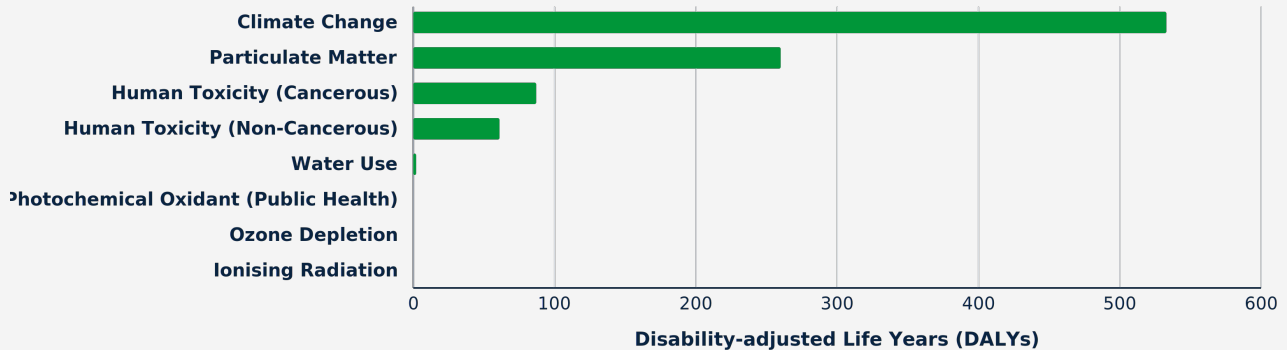
Note that the greatest benefits come from reductions of GHG emissions, which are global air pollutants and thus the impacts are globally distributed. However, there are also

substantial impacts from the reductions in local air pollutants, including particulate matter, cancerous human toxicity emissions and non-cancerous human toxicity emis-

sions, that will provide substantial local public health benefits for Tazewell County and the State of Illinois.

YEAR ONE

Human Health Benefits



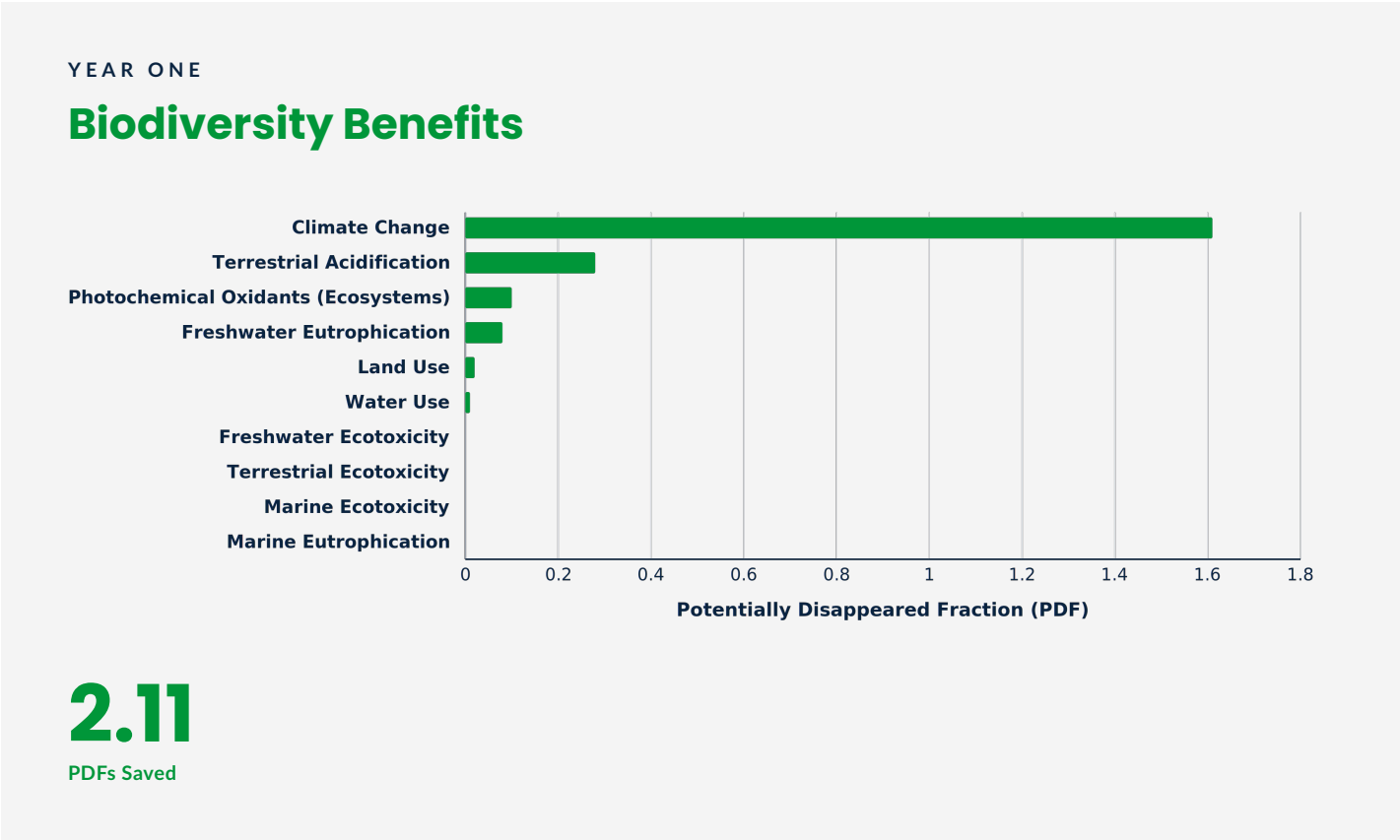
943

Disability-adjusted
Life Years Saved

RESULTS

Ecosystem Impacts

The following figure presents ecosystem quality impacts estimated to be caused by the emissions reductions that Mackinaw Solar will yield in Year 1. It is estimated that in the first year of Mackinaw Solar operation, over **2.11 potentially disappeared fraction of species will be protected** due to the reductions of global air pollutants like CO2 as well as local terrestrial acidification and freshwater eutrophication air pollutants.



RESULTS

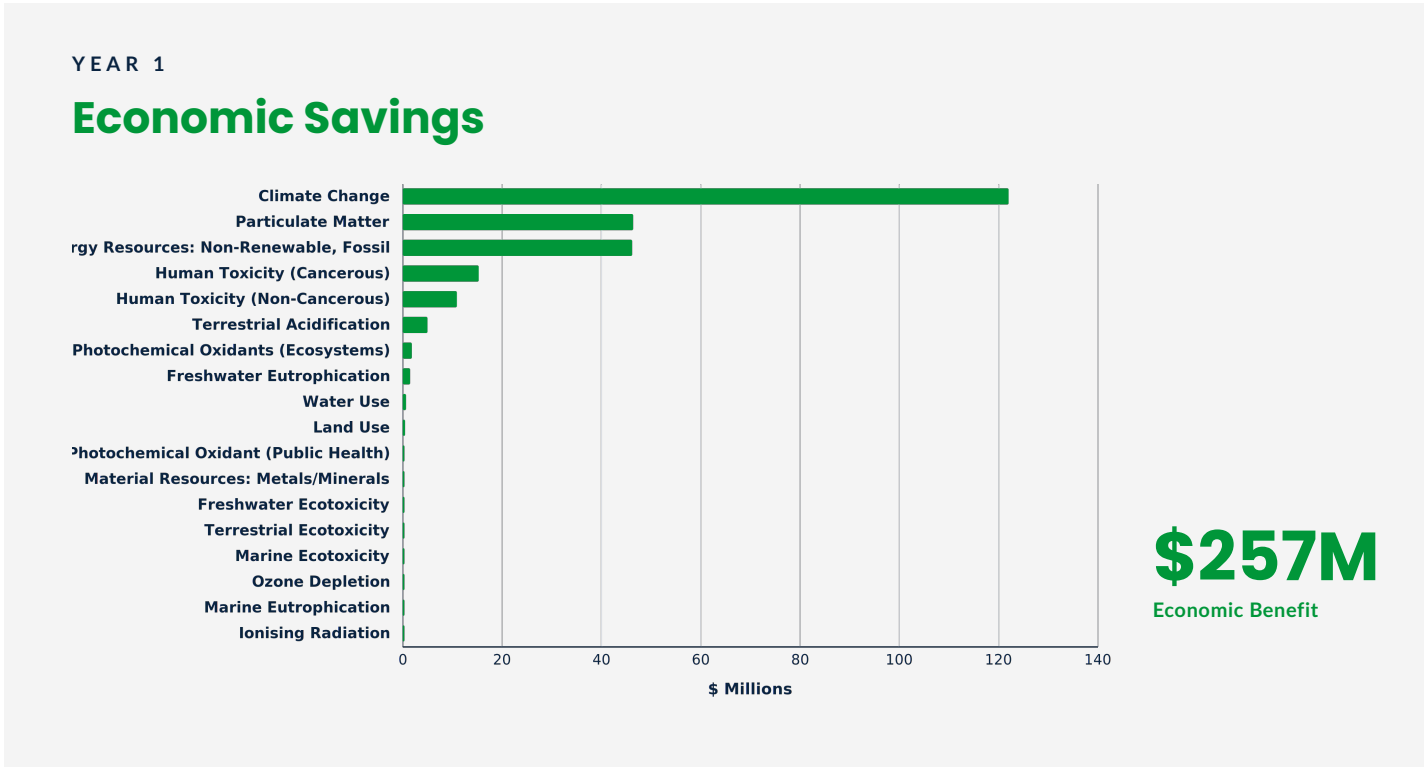
Economic Impacts

The combined public health and ecosystem benefits are projected to yield approximately **\$257 million in economic gains** in the first year. These savings are primarily attributed to the reduction in healthcare costs and the preservation of ecosystem services. Financial valuation methods are from the U.S. EPA Mortality Risk Valuation principles.

Note that the largest benefits come from GHG emissions, which are global pollutants. However, there are also large economic benefits caused by the reduction of numerous local air pollutants, including particulate matter, cancerous human toxicity emissions, non-cancerous human toxicity emissions, terrestrial acidification, freshwater eutrophication and photochemical oxidant emissions, which will be enjoyed by local and regional communities.

Economic values represent the monetized externalities—the real costs to society from health care, lost productivity, ecosystem service degradation, and resource depletion that are avoided by this renewable energy project. These economic impacts are in addition to the direct, indirect and induced economic benefits that the project is expected to achieve through construction spending, local employment, and tax revenues.

Under the operational analysis scope, every impact category yields a positive economic benefit, because the results reflect the avoided damages from displaced fossil fuel combustion and its fuel supply. Manufacturing-phase costs are quantified in the companion cradle-to-grave analysis, available upon request.



RESULTS

Lifetime Projections

The following table presents the cumulative 25-year projections for Mackinaw Solar. The Project has an expected operational lifetime of 30 years; TotalView conservatively modeled the first 25 years of operation. Projections apply a technology-specific annual degradation rate of 0.5%, which accounts for the gradual decline in solar panel efficiency over time. Economic values are discounted at a 3% social discount rate to calculate net present value (NPV), consistent with standard practice for social cost-benefit analysis of infrastructure projects. Over the 25-year modeling period, Mackinaw Solar is projected to generate approximately **25,400 GWh of clean electricity** and **avoid approximately 13,400,000 tonnes of CO2-equivalent emissions**.

PUBLIC HEALTH

22,200

Disability-adjusted Life Years Saved (25-yr)

ECOSYSTEMS

49.7

Potentially Disappeared Fraction of Species Saved (25-yr)

ECONOMY

\$4.38B

Economic Benefit (25-yr NPV)

25-YEAR GWH

25,400

Generation Over Modeling Period

25-YEAR PROJECTIONS

Mackinaw Solar

Metric	25-year Value
Generation (25-yr)	25,400 GWh
Avoided CO2-Eq (25-yr)	13,400,000 tonnes
Disability-adjusted Life Years Saved (25-yr)	22,200
PDFs of Species Protected (25-yr)	49.7
Economic Benefit (25-yr NPV)	\$4.38 billion
Estimated Project Lifetime	30 years
Modeled Period	25 years
Annual Degradation	0.5%
Discount Rate	3%
Capacity Factor	24.6%

A conservative basis. Because the projections cover only the first 25 years of the Project's expected 30-year operational life, the cumulative public health, ecosystem, and economic benefits realized over the full life of Mackinaw Solar are expected to exceed the values presented in this report.



CONCLUSION

Mackinaw Solar Net Benefits for Public Health, Ecosystems, and Economy

The proposed Mackinaw Solar project stands out as a substantial initiative with the potential to protect and enhance public health, improve ecosystem quality, and deliver meaningful economic benefits. By reducing harmful greenhouse gas and air pollutant emissions, the project will contribute to a decrease in respiratory and cardiovascular diseases, benefiting community health and increasing the quality of life and life expectancy in the populations surrounding Mackinaw Solar and the PJM balancing authority. Additionally, the improvement in air quality will bolster local ecosystems, fostering biodiversity and resilience against climate change and other environmental stressors.

In its first year alone, Mackinaw Solar is projected to generate approximately 1,080 GWh of clean energy, leading to substantial reductions in air, water, and soil pollutants. These reductions are expected to save approximately 943 disability-adjusted life years (DALYs) and preserve over 2.11 potentially disappeared fractions (PDFs) of species, yielding approximately \$257 million in economic gains through avoiding these damages.

Over the 25-year modeled period of its expected 30-year operational life, Mackinaw Solar is projected to generate approximately 25,400 GWh of clean electricity, save approximately 22,200 DALYs, preserve 49.7 PDFs of species, and deliver approximately \$4.38 billion in cumulative economic benefits (NPV). These net gains are in addition to the direct, indirect and induced economic benefits that the project is expected to achieve, and benefits realized over the full 30-year life of the Project are expected to exceed these modeled values.

This report presents the Project's operational impacts: the avoided pollution and corresponding public health, ecosystem, and economic benefits caused by the displacement of fossil fuel generation within the PJM balancing authority. This scope isolates the

local and regional changes that communities and regulators evaluating the Project are most interested in. Quantum's companion cradle-to-grave analysis, which additionally accounts for manufacturing, construction, and end-of-life impacts across global supply chains and likewise shows substantial net benefits, is available upon request.

Considering Site-Specific Impacts and Broader Benefits

The scope of this analysis includes quantifying the avoided operational emissions that Mackinaw Solar is expected to achieve in its first year of operation and over the 25-year modeling period. Outside the scope of this report are how Doral's site-specific ecosystem management and mitigation plans will address local considerations, and in some cases potentially improve site-specific land use impacts. These plans, along with other information provided by the developer, are expected to be addressed in other project filings and demonstrate additional local benefits that are not quantified in this report.

It is important to note that the public health, ecosystem and economic benefits account for both local and global air pollutants.

Reducing global air pollutants, such as CO₂ and ozone depleting substances, leads to benefits at a global scale. Reducing local air pollutants, such as particulate matter, human toxicity emissions and photochemical oxidants, produce health benefits that will be enjoyed by local and regional communities, leading to:

Improved Public Health

Reduced emissions of particulate matter, toxic substances, and other pollutants will lower the incidence of respiratory and cardiovascular diseases, enhancing the quality of life and life expectancy for local and regional populations.

Enhanced Ecosystem Quality

Lower emissions will mitigate acidification, eutrophication, and other stressors on ecosystems, supporting biodiversity and resilience.

Economic Gains

The public health and ecosystem benefits will yield substantial economic savings, reinforcing the project's value as a sustainable energy solution.

A Holistic Perspective

In conclusion, the Mackinaw Solar project offers a substantial positive outcome by significantly enhancing public health, ecosystem quality, and economic well-being. Recognizing and mitigating site-specific impacts is essential, but the broader benefits of emissions reductions and clean energy generation underscore the local and regional benefits of advancing renewable energy initiatives. By embracing a balanced and comprehensive view, stakeholders can appreciate the substantial contributions of the Mackinaw Solar project to a healthier, more sustainable future for all.

REFERENCE

Glossary & Methodology Notes

DALYs (Disability-Adjusted Life Years)

A measure of disease burden expressed as the number of years of healthy life lost due to illness, disability, or premature death. One DALY equals one year of full health lost. In TotalView, DALYs quantify the human health benefits of displacing fossil fuel pollution with renewable energy.

PDFs (Potentially Disappeared Fraction of Species)

A biodiversity impact metric measuring the fraction of species potentially lost from an ecosystem over a given area and time. PDFs integrate the effects of acidification, ecotoxicity, eutrophication, and land use changes. Higher avoided PDFs indicate greater biodiversity protection.

ReCiPe 2016

A life cycle impact assessment method that quantifies emissions and resource use and maps impacts to a limited number of environmental impact categories.

Life Cycle Assessment (LCA)

A systematic methodology (ISO 14040/14044) for evaluating the environmental impacts of a product or system throughout its entire life cycle, from raw material extraction through manufacturing, use, and end-of-life disposal.

Operational Scope

The analysis boundary applied in this report. It covers the operational phase of the electricity system: the operation of the Project and the displaced fossil fuel generation, including the fuel supply of that displaced generation. Manufacturing, construction, and end-of-life impacts are excluded and are quantified in the companion cradle-to-grave analysis, available upon request.

Cradle-to-Grave (CTG)

An LCA boundary that covers the full life cycle: manufacturing, transportation, installation, operation, and decommissioning of the renewable energy system and its displaced fossil fuel generation. Quantum

performed a companion CTG analysis of the Project; those results are available upon request.

Net Present Value (NPV)

The present-day value of future economic benefits, discounted at a 3% social discount rate. Used for lifetime economic projections to account for the time value of money.

Capacity Factor

The ratio of actual energy output to the theoretical maximum output if the plant operated at full capacity 24/7. Varies by technology, location, and weather conditions.

Grid Baseline

The average environmental impact rate per MWh of electricity generated on the grid, computed from hourly grid impact analysis over a 30-day rolling period. Used as a comparison anchor for project-level results.

Displacement Multiplier

The ratio of a project's avoided impact rate to the grid baseline rate. A multiplier greater than 1.0x indicates the project displaces generation with above-average environmental impact, delivering disproportionate benefit per MWh.

Planned Capacity

Generators reported to the EIA as planned or under construction (status codes P, L, T, U, V, TS). These have been approved or are being built but are not yet generating electricity.

8760 Profile

An hourly generation forecast covering all 8,760 hours of a year, supplied by the project developer and used as the input to the hourly grid simulation.

Modeled Period

The portion of the Project's estimated operational lifetime simulated by TotalView. For Mackinaw Solar, TotalView conservatively modeled the first 25 years of the estimated 30-year lifetime.

REFERENCE

Data Sources & Key Assumptions

Data Sources

- EIA Hourly Electric Grid Monitor (real-time generation data)
- ecoinvent Life Cycle Inventory Database
- ReCiPe 2016 Impact Assessment Method
- Developer supplied 8760 expected generation profile

Key Assumptions

- Marginal dispatch methodology: renewable generation displaces the most expensive (marginal) fossil generation in the balancing authority while adhering to technical and environmental constraints. Quantum Energy's methodology is documented at <https://quantum-ec.com/methodology>.
- Economic benefits represent monetized public health and ecosystem impacts that are in addition to the direct, indirect and induced economic benefits from investment and tax revenue, job creation, etc.
- Projections use technology-specific annual degradation rates (0.5% solar).
- Social discount rate of 3% applied to NPV calculations.
- This report presents an Operational analysis scope: manufacturing, construction, and decommissioning impacts are excluded from the results presented herein and are quantified in Quantum Energy's companion cradle-to-grave analysis of the Project, which is available upon request.
- The Project's estimated operational lifetime is 30 years; TotalView conservatively modeled the first 25 years of operation. Displaced generation values are rounded down to the nearest GWh.



**Making a quantum leap
in energy decision-
making for the health of
our **economy**, **people**,
and **planet**.**

Quantum Energy

10 E Yanonali St

Santa Barbara, CA 93101

contact@quantum-ec.com

quantum-ec.com

Exhibit Y
Catastrophic Incident Coordination and Recovery Plan

Catastrophic Incident Coordination and Recovery

This document lays out a framework and guidance for response and recovery from a catastrophic incident the impacting Mackinaw Solar Project in Tazewell County, IL

Date:

August 17, 2026

Prepared for:

Mackinaw Solar

Prepared by:

Stantec Consulting, Inc.

Project/File:

190319031



Revision Record

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date

Disclaimer

The conclusions in the Report titled Catastrophic Incident Coordination and Recovery are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Mackinaw Solar (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Prepared by:

Signature

Zach Baker, CEM®, PMP

Reviewed by:

Signature

Tony Parker, PMP

Approved by:

Signature

Elizabeth Corrigan, PMP, LEED AP

Table of Contents

1	Purpose	1
2	Scope.....	1
3	Hazard Identification and Risk Assessment	1
4	Pre-Incident Coordination with Tazewell County EMA	2
5	Incident Coordination	4
6	Emergency Notification and Coordination	5
7	Resource Coordination	5
8	Damage Assessment.....	6
9	Debris Management and Environmental Protection	6
10	Recovery Coordination.....	7
11	Mutual Aid and External Assistance	7
12	Post-Incident Review and Improvement.....	8
13	Facility Ownership	8



Executive Summary

This Catastrophic Incident Coordination and Recovery Annex provides a framework for Mackinaw Solar to coordinate with local emergency responders, Tazewell County Emergency Management Agency (EMA), utility providers, contractors, and regulatory agencies before, during, and after a catastrophic incident affecting the facility or surrounding community. The Annex supplements the Emergency Response Plan by addressing emergency coordination, recovery operations, debris management, damage assessment, and public information activities.

The Annex identifies the natural, technological, and human-caused hazards most likely to affect the facility, including tornadoes, severe thunderstorms, flooding, winter storms, fires, hazardous material releases, utility outages, cyber incidents, and intentional damage. It establishes a Project Emergency Liaison to serve as the primary point of contact between Mackinaw Solar and responding agencies, providing facility information, technical support, access to site documentation, and coordination of recovery resources.

A key component of the Annex is ongoing coordination with Tazewell County EMA to ensure emergency management personnel have current information regarding facility operations, emergency contacts, site access, hazardous materials, waste management procedures, and debris disposal practices. This information can be used to support response planning, debris management efforts, and public communications following a major incident.

The Annex also establishes procedures for emergency notification, resource coordination, damage assessment, debris removal, environmental protection, mutual aid support, and phased recovery activities. By formalizing pre-incident coordination and post-incident recovery expectations, the Annex helps ensure an organized response while providing local officials and the public with accurate information regarding cleanup, restoration, and facility recovery activities.



1 Purpose

This Annex establishes procedures for coordination between Mackinaw Solar, responding emergency agencies, Tazewell County Emergency Management Agency (EMA), public utilities, regulatory agencies, contractors, and other stakeholders following a catastrophic incident that significantly impacts facility operations, public safety, the environment, or surrounding communities. This Annex supplements the Emergency Response Plan and outlines how Mackinaw Solar will coordinate with local jurisdictions during response, recovery, debris management, and public information activities.

The objectives of this Annex are to:

- Protect life, public safety, property, and the environment.
- Support local emergency response activities.
- Establish a framework for incident coordination.
- Facilitate resource requests and mutual aid support.
- Support damage assessment and recovery operations.
- Restore facility infrastructure and operations following a catastrophic incident.
- Ensure local emergency management agencies have information necessary to support public communications, debris management, and recovery operations.

2 Scope

This Annex applies to catastrophic incidents that exceed normal facility emergency response capabilities and require coordination with external response agencies, utility providers, emergency management personnel, contractors, or governmental entities.

A catastrophic incident may include:

- Fatalities or serious injuries.
- Significant damage to facility infrastructure.
- Off-site impacts to neighboring properties or public infrastructure.
- Significant environmental impacts.
- Multi-agency emergency responses.
- County, state, or federally declared emergencies.

3 Hazard Identification and Risk Assessment

The following hazards have been identified based on the Tazewell County Multi-Hazard Mitigation Plan, Illinois Emergency Operations Plan, Illinois Emergency Management Agency Act, and the operational characteristics of the Mackinaw Solar Facility.



Catastrophic Incident Coordination and Recovery

Hazard Type	Potential Incident	Potential Project Impacts	External Coordination
Tornado	Direct strike or near miss	Structural damage, tracker damage, module destruction, debris field, access restrictions	Fire Department, EMA, Law Enforcement, Utility Provider
Severe Thunderstorm	High winds, hail, lightning, heavy rainfall	Equipment damage, flooding, debris generation, road access impacts	Fire Department, EMA, Utility Provider
Lightning	Direct strike to facility equipment	Fire, inverter damage, transformer damage, electrical faults	Fire Department, Utility Provider
Flooding	Flash flooding or prolonged inundation	Access limitations, erosion, equipment damage, drainage impacts	EMA, Road Authorities, Utility Provider
Winter Storm	Snow, ice, freezing rain	Access limitations, structural impacts, utility disruptions	Road Authorities, Utility Provider
Earthquake	Seismic event	Structural damage, electrical equipment impacts, limited site access	EMA, Fire Department, Utility Provider
Regional Catastrophic Event	Multi-jurisdiction disaster affecting Tazewell County	Prolonged outage, major damage, resource shortages	EMA, Mutual Aid Organizations, Utility Providers

Catastrophic Incident Threshold

For purposes of this Annex, a catastrophic incident includes any event that includes any of the following:

- Results in loss of life or serious injury.
- Requires multi-agency emergency response.
- Causes significant damage to facility infrastructure.
- Creates off-site public safety or environmental impacts.
- Requires mutual aid resources.
- Impacts utility transmission infrastructure.
- Results in prolonged loss of facility operations.
- Requires county, state, or federal emergency management support.

4 Pre-Incident Coordination with Tazewell County EMA

Mackinaw Solar shall maintain ongoing coordination with the Tazewell County Emergency Management Agency (EMA) to ensure local emergency management personnel have information necessary to support emergency response, debris management, public information efforts, and recovery planning following a catastrophic incident. Local governments are identified as the primary response and recovery entities within Illinois emergency management planning.



Catastrophic Incident Coordination and Recovery

Information Maintained for Emergency Planning

Upon request from Tazewell EMA, the Project Emergency Liaison shall periodically provide or make available the following information for emergency planning purposes:

- Emergency contact information.
- Site access maps and emergency access routes.
- Facility layout drawings.
- Electrical isolation and shutdown procedures.
- Emergency Response Plan updates.
- Hazardous material inventories and Safety Data Sheets (SDS).
- Waste Management Plan updates.
- Contractor and specialized response resource information.
- Debris management procedures for damaged solar facility components.

Details about designation of Project Emergency Liaison can be found in Section 5.

Waste Management and Debris Coordination

To facilitate disaster recovery operations, Mackinaw Solar shall coordinate with Tazewell County EMA regarding anticipated waste streams and debris management procedures associated with damage to solar facility infrastructure.

Information provided may include:

- General descriptions of photovoltaic modules and related equipment.
- Potential waste streams generated following a catastrophic incident.
- Procedures for segregation, handling, transportation, recycling, and disposal of damaged facility components.
- Identification of qualified waste management, recycling, and disposal contractors.
- Environmental protection measures associated with cleanup activities.
- Regulatory requirements applicable to debris management and disposal activities.

The purpose of this coordination is to ensure Tazewell County EMA possesses accurate information that can be utilized during recovery operations and shared with local residents who may have questions regarding damaged project infrastructure, debris, environmental concerns, cleanup activities, or disposal practices following a catastrophic event.

Public Information Support

Following a catastrophic incident, the Project Emergency Liaison shall support Tazewell County EMA by providing information suitable for public distribution regarding:



Catastrophic Incident Coordination and Recovery

- Debris cleanup activities.
- Public safety precautions.
- Environmental protection measures.
- Procedures for reporting debris located outside project boundaries.
- Recovery status updates.
- Community contact information for questions regarding cleanup and restoration activities.

All public communications shall be coordinated with responding agencies and governmental authorities to ensure consistency and accuracy.

Annual Review

Mackinaw Solar shall review the Catastrophic Incident and Recovery Annex (this document) at least annually and whenever significant changes occur to facility operations, emergency procedures, or waste management practices.

5 Incident Coordination

During a catastrophic incident, Mackinaw Solar personnel shall support emergency response activities through coordination with responding agencies while recognizing that emergency operations remain under the authority of the responding jurisdiction and governmental agencies.

Mackinaw Solar shall designate a Project Emergency Liaison to serve as the primary point of contact between the facility and responding agencies throughout response and recovery activities.

The Project Emergency Liaison shall:

- Provide site-specific information and technical support.
- Answer questions from responding agencies regarding facility equipment and operations.
- Facilitate access to relevant facility records, maps, drawings, and operating information.
- Coordinate communications between responding agencies and facility ownership.
- Coordinate information requests for contractors, vendors, engineers, and technical specialists.
- Provide relevant information regarding equipment status, shutdown procedures, and operational limitations.
- Assist with damage assessment efforts.

Coordinate recovery planning activities with respect to the Mackinaw Solar facilities. The Project Emergency Liaison shall not direct emergency response activities and shall not interfere with operations conducted by emergency responders, unless safety concerns would prevent those operations.

Potential agencies participating in incident coordination may include:

- Local Fire Protection District.
- Emergency Medical Services (EMS).
- Local Law Enforcement.



- Tazewell County EMA.
- Utility Operators.
- Township Road Authorities.
- Tazewell County Community Development Department.
- Illinois Emergency Management Agency and Office of Homeland Security (IEMA-OHS).
- Mutual Aid Organizations and Specialized Response Teams, if deployed.

6 Emergency Notification and Coordination

Upon identification of a catastrophic incident:

1. Contact 911.
2. Notify the Mackinaw Solar 24-hour emergency contact.
3. Notify facility management personnel.
4. Notify the interconnecting utility, if applicable.
5. Notify Tazewell County EMA when:
 - Public safety impacts exist;
 - Off-site impacts occur;
 - Hazardous materials are involved;
 - Significant facility damage occurs;
 - Mutual aid support may be necessary.

The Project Emergency Liaison shall serve as the primary point of contact throughout response and recovery activities.

7 Resource Coordination

Mackinaw Solar shall support response activities by providing resources and information available to assist emergency responders.

Available resources may include:

- Civil or Electrical Engineering drawings.
- Emergency response maps.
- Access route information.
- Temporary staging areas.
- Heavy equipment contractors.
- Electrical contractors.
- Environmental consultants.
- Vegetation management contractors.
- Debris removal contractors.



8 Damage Assessment

Following stabilization of incident conditions, Mackinaw Solar shall coordinate damage assessment activities that may include:

- Solar module inspections.
- Tracker system evaluations.
- Inverter inspections.
- Collection system inspections.
- Substation inspections.
- Road and access evaluations.
- Drainage assessments.
- Environmental impact assessments.
- Security and fencing assessments.

Assessment results may be shared with:

- Tazewell County EMA.
- Responding Fire Department.
- Community Development Department.
- Utility Operators.
- Insurance Representatives.
- Regulatory Agencies, as required.

9 Debris Management and Environmental Protection

Catastrophic incidents may generate substantial debris requiring coordinated removal and disposal.

Component	Typical Damage Scenario	Waste Stream	Example Recovery Action
Photovoltaic Modules	Tornado, hail, fire, wind damage	Solar panel debris	Segregate, containerize, and recycle where feasible
Steel Racking	Structural damage	Scrap metal	Recycle through approved facilities
Conductors and Wiring	Fire or storm damage	Electrical equipment waste	Segregate and recycle
Inverters	Electrical failure or fire	Electrical equipment waste	Contractor removal and recycling
Transformers	Fire or impact damage	Equipment debris and potentially regulated waste	Environmental assessment and contractor removal
Fencing	Wind or impact damage	Construction debris	Remove and recycle when practical



Vegetative Debris	Storm damage	Organic debris	Dispose or recycle in accordance with local requirements
--------------------------	--------------	----------------	--

Debris removal priorities shall include:

1. Protection of life and public safety.
2. Emergency access restoration.
3. Environmental protection.
4. Utility restoration.
5. Long-term facility recovery.

10 Recovery Coordination

Recovery activities shall generally occur in three phases.

Short-Term Recovery

- Secure the site.
- Restore emergency access.
- Stabilize damaged infrastructure.
- Remove immediate hazards.

Intermediate Recovery

- Complete assessments.
- Repair critical infrastructure.
- Restore portions of facility operations.
- Complete environmental remediation activities.

Long-Term Recovery

- Complete permanent repairs.
- Restore full facility operations.
- Implement corrective actions.
- Update planning and response documentation.

11 Mutual Aid and External Assistance

When local resources become overwhelmed, Tazewell County EMA and responding agencies may coordinate additional support resources through existing emergency management systems.

Potential support organizations may include:

- Mutual Aid Box Alarm System (MABAS).
- Hazardous Materials Response Teams.
- Technical Rescue Teams.



- Illinois Emergency Services Management Association (IESMA).
- Illinois Incident Management Team Resources.
- Illinois Public Works Mutual Aid Network (IPWMAN).
- Illinois Emergency Management Agency Resources.
- Utility Emergency Restoration Resources.

12 Post-Incident Review and Improvement

Following any catastrophic incident, Mackinaw Solar shall conduct a post-incident review to evaluate emergency response effectiveness and identify opportunities for improvement.

The review may evaluate:

- Agency coordination.
- Emergency communications.
- Resource management.
- Recovery performance.
- Public information effectiveness.
- Debris management activities.
- Lessons learned.
- Corrective actions.

Corrective actions shall be documented and incorporated into future revisions of the Emergency Response Plan, training programs, emergency coordination procedures, and supporting recovery documentation.

13 Facility Ownership

If ownership of the Project is transferred, the new Facility Owner shall notify applicable emergency response agencies and local jurisdictions, including the local fire department, law enforcement agencies, 911 dispatch center, and the Tazewell County Emergency Management Agency. Updated emergency contact information, including the 24-hour emergency contact and operations and maintenance contact, shall be provided to ensure emergency response agencies maintain current Project contact information.





Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.



Stantec Consulting Services Inc.
350 North Orleans Street, Suite 8000N
Chicago IL 60654-1610
stantec.com

Exhibit Z
Stormwater Management Plan

***** Items not include in the ZBA Packet due to space restrictions. Do not hesitate to contact the office if this you wish to review this item.**