Town of Cortland: Solar Farm Development Permit

Aspasia Solar Project, LLC.

Paul Bottum - Cultivate Power

March 2024

COMMUNITY SOLAR IN ILLINOIS

The Aspasia Solar Project will connect to the local distribution grid and provide power to customers within ComEd Illinois service territory.

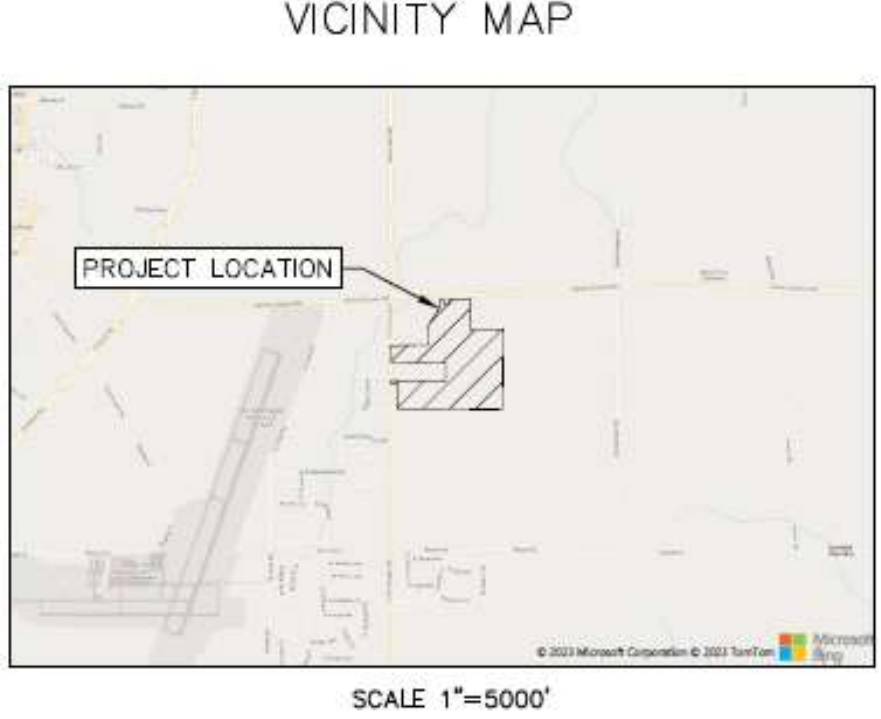
ComEd customers (including homeowners, renters, and businesses) can subscribe to receive a portion of the renewable energy produced.

Credits for ComEd customers are applied directly to the customer’s bill. There is no delay in the credit applied to the ComEd customer’s bill and no change to the customer's billing cycle.

community-solar-faq-2018.ashx

ASPASIA SOLAR PROJECT

- Proximity to relevant electrical and road infrastructure
- Topography of land and uplands
- Interest from our landowners
- Compliance with land use and surrounding uses
- Compliance with local ordinances



Aspasia Solar Project , LLC

Location: Barber Greene Rd, Cortland, IL 60112

Township: Cortland

Zoning District: AG Agricultural District

Total Parcels: 103 Acres

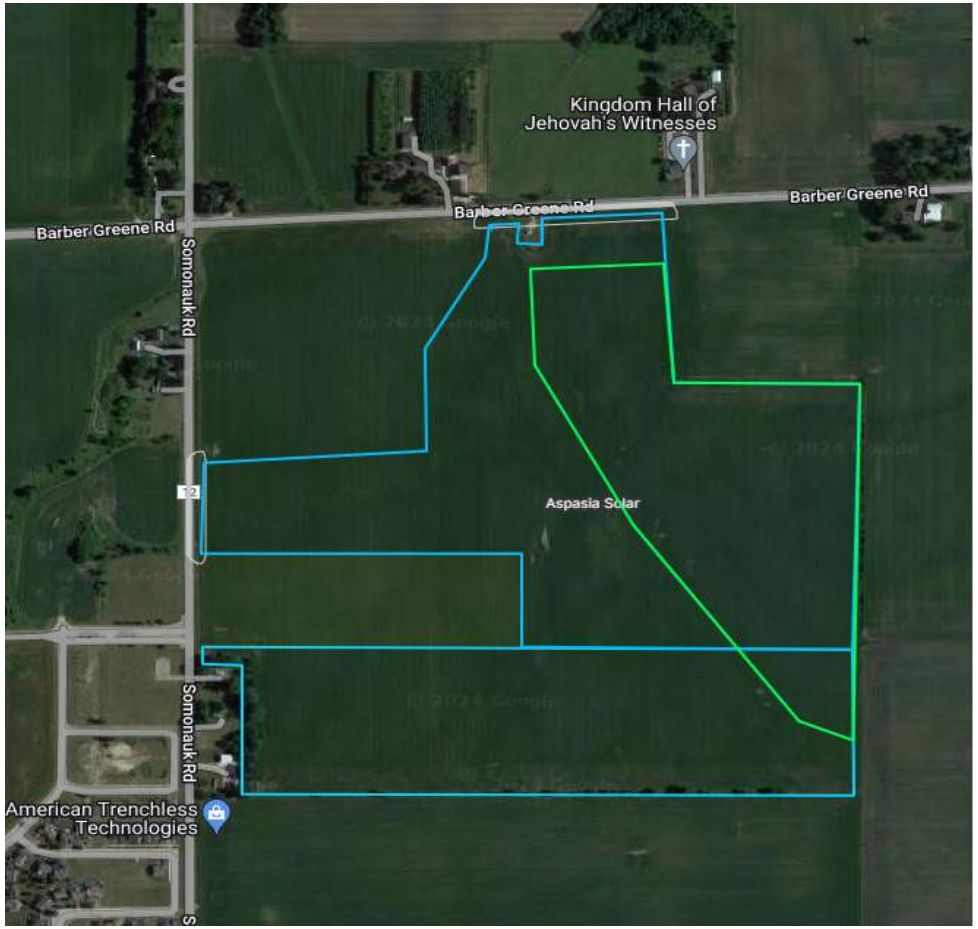
Proposed Project Area: 33 Acres

Interconnection Utility: ComEd

Project Size: 5 MWac

Power Output: ~8 million kWh/year, enough to provide electricity to 1,100 homes[1]

1 https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator



Blue: parcel boundaries

Green: project boundary

Aspasia Solar Project
SUP Application
Highlights

TOWN OF CORTLAND COMMERCIAL SOLAR FACILITY ORDINANCE REQUIREMENTS

Solar Farms and Solar Gardens that are the principal use on the property may only be located and permitted in an Agricultural (AG) district or a Light Industrial (I-1), but only when authorized and approved as a special use by the town board after public hearing and recommendation by the planning commission.

Such special use as may be allowed shall be subject to the following requirements, restrictions, and conditions:

1. ***Bulk regulations:***
    a. *Minimum Lot Area:* Five (5) Acres.
    b. *Front and Corner Side Yard:* Fifty feet (50').
    c. *Side Yard:* Fifty feet (50').
    d. *Rear Yard:* Fifty feet (50').
    e. *Height:* Ground or pole mounted solar energy system will not exceed ten feet (10') in height as measured when the system is oriented at its maximum tilt. All other equipment will not exceed fifteen feet (15') in height.
2. ***Off-Street Parking:*** There will be a minimum of two (2) parking spaces with minimum dimensions of ten by twenty feet (10' x 20'). Accessways will be a minimum of twelve feet (12') wide. Parking spaces and accessways will have a have a minimum of a seven inch (7") compacted stone base. Accessways located within the right-of-way shall meet standards set by the town engineer.
3. ***Signage:*** The project will have a sign posted at the entrance with the operator emergency contact information. There will be appropriate warning signs posted around the perimeter of the project.

TOWN OF CORTLAND COMMERCIAL SOLAR FACILITY ORDINANCE REQUIREMENTS

4. ***Power and Communication Lines:*** Power and communication lines running between banks of solar panels will be buried underground. Utility poles and a power line will be installed aboveground to interconnect to the existing overhead electrical infrastructure.

5. ***Batteries:*** There will be no battery storage(BESS) on the site.

6. ***Interconnection:*** An interconnection agreement has been completed with the ComEd electric utililty and an interconnection deposit has been submitted

7. ***Stormwater and NPDES:*** The facility will comply with all of the requirements of the Town of Cortland stormwater, erosion and sediment control provisions and NPDES permit requirements.

8. ***Ground Cover and Buffer Areas:*** Aspasia Solar project will have ground cover and pollinator friendly seed mix as recommended. The ground cover pollinator mix will help prevent soil erosion and mitigate stormwater run off.

9. ***Foundation:*** A qualified engineer will certify that the foundation and design of the solar panel's racking and support is within accepted professional standards

10. ***Other Standards and Codes****:* Aspasia Solar Project will be in compliance with all applicable local, state and federal regulatory codes

TOWN OF CORTLAND COMMERCIAL SOLAR FACILITY ORDINANCE REQUIREMENTS

11. ***Site Plan Required:*** A detailed site plan showing both existing and proposed conditions has been submitted, showing location of all solar arrays, other structures, property lines, rights-of-way, easements, service roads, floodplains, wetlands and other protected natural resources, topography, electric equipment, and all other characteristics requested by the Town.

12. ***FAA Compliance:*** The project has consulted with the local airport authority and an FAA study has been completed. The project has received a determination of "no hazard to air navigation".

13. ***Endangered Species and Wetlands:*** An EcoCAT report was submitted as part of the application. The consultation has been terminated. We will also complete a USFWS study for this Aspasia Solar project as part of our due diligence process.

14. Upon request from the town, the owner or operator of a solar farm or solar garden must submit, within fourteen (14) calendar days, a current operation and maintenance report to the town.

Compliance with Town of Cortland Requirements for Solar Ene Systems

SPECIAL USE STANDARDS 9-10-3 and SOLAR ENERGY FACILITY SECTION 9- 4-34

Aspasia Solar Project complies with Town of Cortland Requirements and Standards for a Solar Energy Facility. Please see Project Narrative or attached Appendices for more detail on our compliance. Highlights of our project include:

- ✓ The project contributes to the general welfare of the neighborhood or community with clean reliable energy, increased tax revenue and subscriptions for discounted energy.
- ✓ The project is self-contained and does not produce pollution, noise, or significant traffic.
- ✓ The project exceeds setback restrictions to accommodate community and neighbor concerns.
- ✓ The project complies with groundcover and buffer areas to prevent soil erosion and the management of stormwater run-off.
- ✓ Decommissioning Planning: Aspasia Solar Project has submitted a Decommissioning Plan per the requirements of the ordinance. The Decommissioning Plan complies with the code and outlines details such as decommissioning steps and financial assurance.

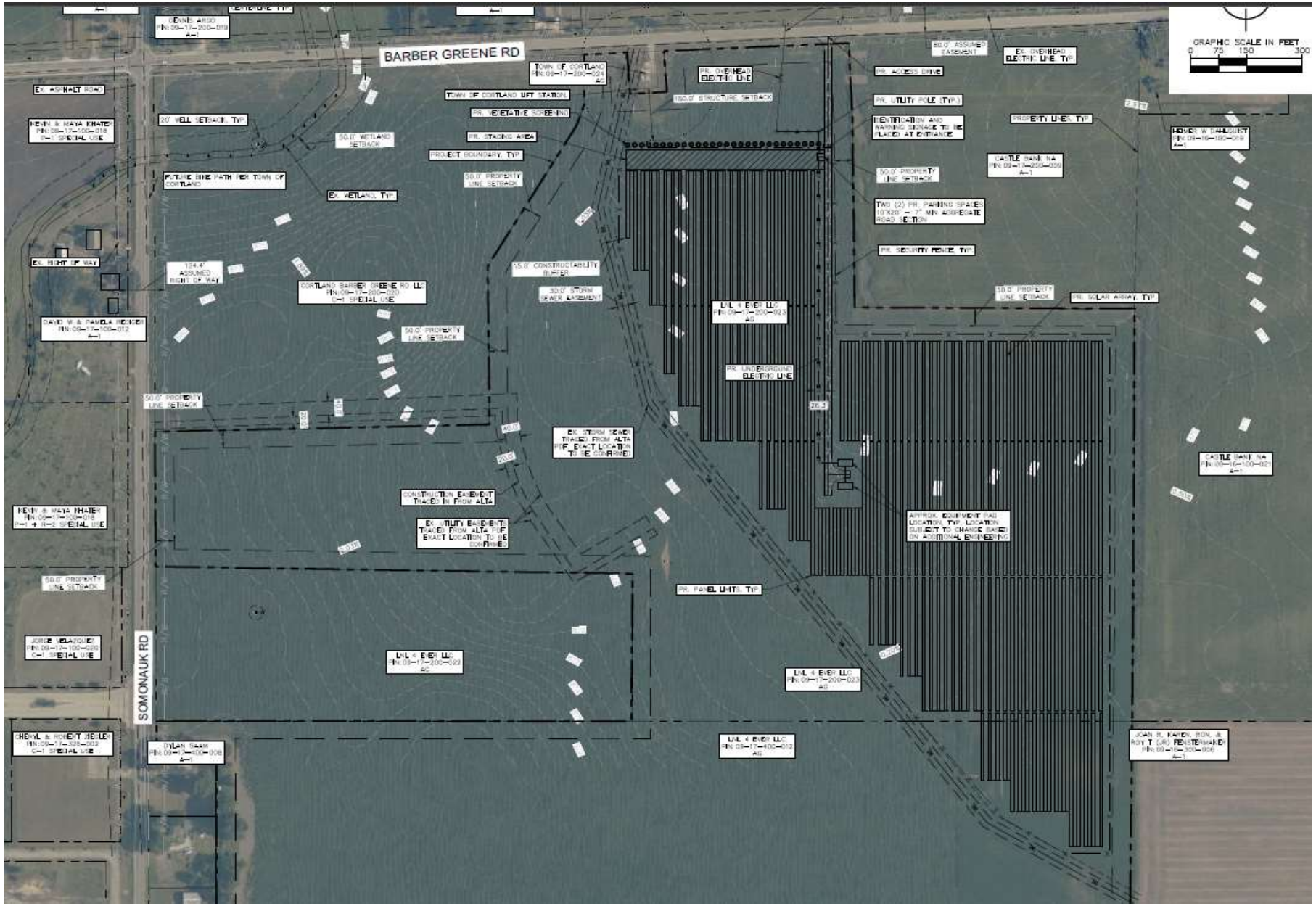
Updates since November 2, 2023 Planning Commission Meeting

We have incorporated changes based on discussion with Town of Corland staff.

Changes based on feedback include:

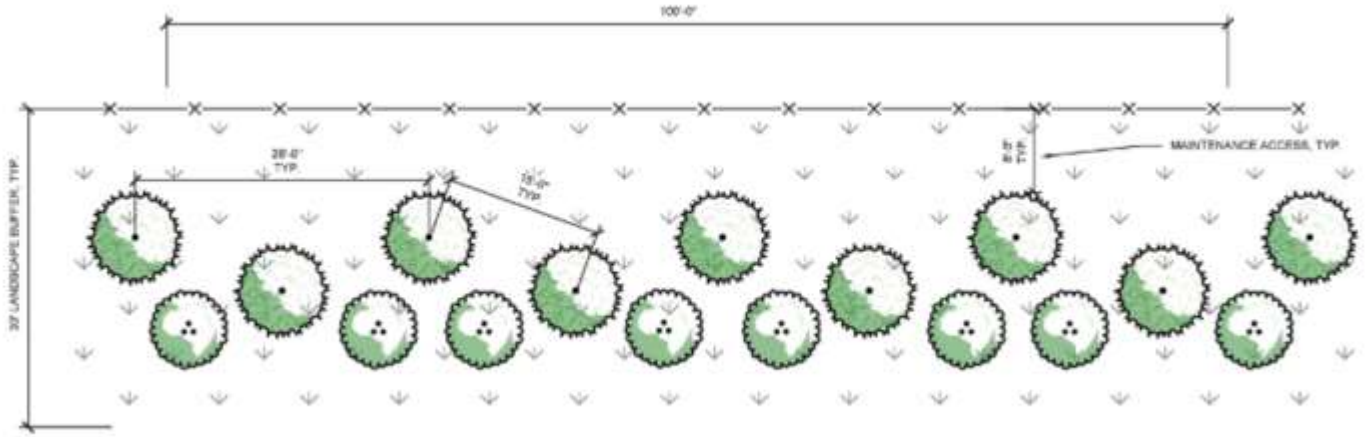
- The siting of the solar energy system has been revised and is now located on the eastern side of the parcel, east of the storm sewer easement. This move addressed the concern of the system being located close to the main thoroughfare of Somonauk Road.
- An extensive vegetative buffer along the north aligns with the Town's aesthetic preferences.
- We reached out to the DeKalb Airport Manager, Renee Riani to discuss the project and have received confirmation from the Federal Aviation Administration ("FAA") that the Project will not pose as a hazard to air navigation.
- The DeKalb Engineer, DSATS Director Nathan F. Schwartz, P.E. was contacted and reviewed the project and its driveway access location. Mr. Schwartz has stated that Barber Greene Rd is within The Town of Cortland's jurisdiction.

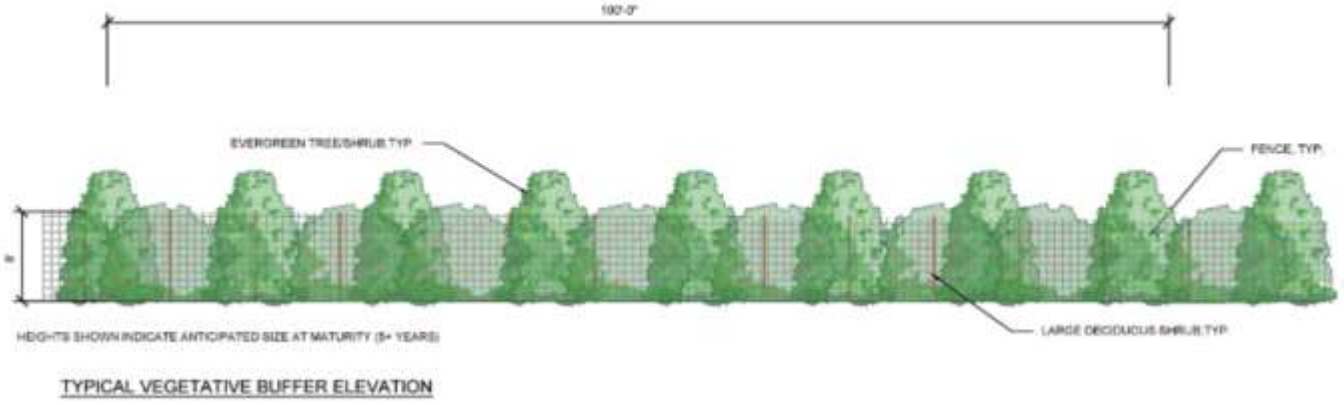
Aspasia Solar Project - Site Plan



Proposed Vegetative Buffer

- Vegetative screening will consist of a combination of native evergreen trees and large deciduous shrubs in alternate rows, which are suitable for screening and the site-specific soil type. Anticipated height at maturity (5+ years) is approximately 8 ft.
- All screening will be installed prior to operation of the project and will be maintained for the project's lifetime.





REAL ESTATE ADJACENT PROPERTY VALUE IMPACT

FINDINGS:

Academic Studies – 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, which concluded existing solar facilities have had no negative impact on adjacent property values

Interviews with Assessors in Illinois:

- In Otter Creek Township, in LaSalle County, Illinois, Viki Crouch, the Township Assessor, said that there has been no impact on property values due to their proximity to the **Grand Ridge Solar Farm**
- In Winnebago County, Illinois, Ken Crowley, Rockford Township Assessor stated that he has seen no impact on property values in his township as an effect of proximity to the **Rockford Solar Farm.**
- In Champaign County, Illinois, James Weisiger noted that there appears to have been no impact on property values as a result of proximity to the **University of Illinois Solar Farm**.

CONCLUSION:

Considering the preceding, the data indicates that solar facilities do not have a negative impact on adjacent property values

SOLAR FARMS – AGRICULTURAL PRESERVATION

Solar Overview

Maintains permeable nature of the land due to limited concrete

Field tiles located prior to construction, designed around, and repaired/replaced when needed

Land is seeded with native Illinois vegetation and maintained as Pollinator Friendly, and re-seeded post deconstruction

Agricultural land lies fallow allowing natural biological process to rejuvenate the soil

Agricultural Impact Mitigation Agreement

Sets standards for construction and deconstruction including:

- Support Structures
- Cabling depth
- Drain Tiles
- Topsoil
- Construction timing
- Decommissioning

STORMWATER/SWPPP/DRAINAGE

- The American Society of Civil Engineers issued an Abstract titled Hydrologic Response of Solar Farms.
- The report analyzed the affects of solar panels over vegetated ground cover.
- The report concluded “Solar panels over a grassy field does not have much of an effect on the volume of runoff, the peak discharge, nor the time to peak.”

Hydrologic Response of Solar Farms

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

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

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

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

Introduction

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

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

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

Model Development

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

To determine the effects that the solar panels have on runoff characteristics, a model of a solar farm was developed. Runoff in the form of sheet flow without the addition of the solar panels served as the preparceled condition. The parceled condition assumed a downgradient series of cells with one solar panel per ground cell. Each cell was separated into three sections: wet, dry, and space. The dry section is that portion directly underneath the solar panel, unexposed directly to the rainfall. As the angle of the panel from the horizontal increases, more of the rain will fall directly onto

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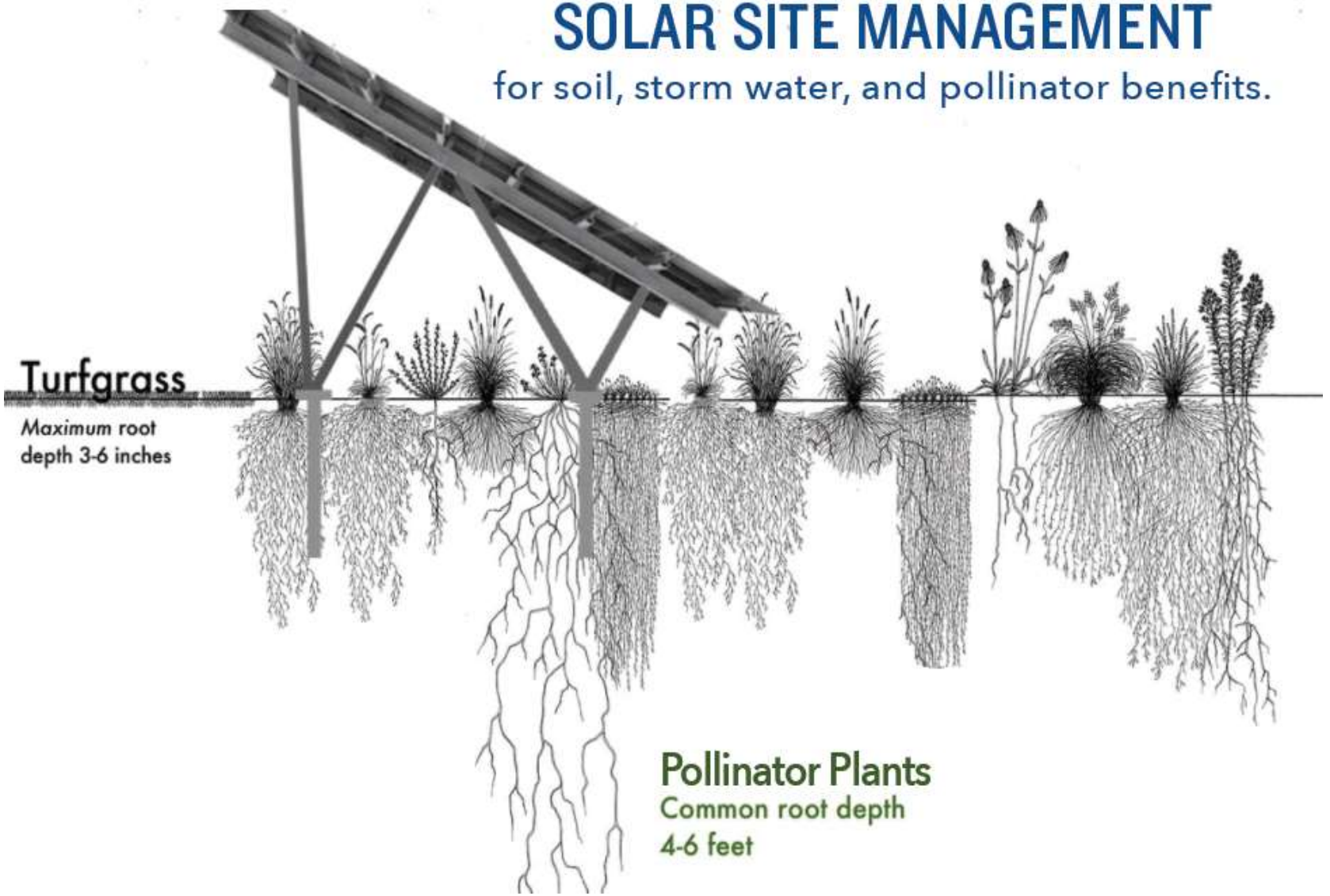
Note: This manuscript was submitted on August 12, 2010; approved on October 20, 2011; published online on October 24, 2011. Discussion period open until October 1, 2013; separate discussions must be submitted for individual papers. This paper is part of the *Journal of Hydrologic Engineering*, Vol. 18, No. 5, May 1, 2013. © ASCE, ISSN 1084-0699/2013/5-536-543/$25.00.

SOLAR SITE MANAGEMENT

for soil, storm water, and pollinator benefits.



- Improve Water Quality
- Reduce Soil Erosion
- Resist Climate Conditions
- Increase Organic Content
- Increase Topsoil Depth
- Provide Native Habitat
- Provide Weed Resistance
- Reduce Ambient Temperature
- Resist Invasive Species

SOLAR FARMS – PROPERTY TAX BENEFITS – ASPASIA SOLAR PROJECT

Solar farms are taxed according to their MW size, per Public Act 100-0781.

District	Tax Rate
SCHOOL DISTRICT 427	5.89365
COUNTY	0.96766
TOWN OF CORTLAND	0.89173
CC 523 KISHWAUKEE	0.60874
SYCAMORE FIRE	0.32101
CORTLAND LIBRARY	0.31183
CORTLAND ROAD AND BRIDGE	0.14698
CORTLAND TOWNSHIP	0.07566
FOREST PRESERVE	0.06915
TOTAL	9.286410%

	Ag Lands 2022	Solar Farms Y1
Assessed Value Y1	$45,271	$418,560
%	9.286410%	9.286410%
Taxes Year 1	$2102	$40,165
Lifetime project revenue		$851,960

Aspasia Solar Project Year 1 tax benefits:

School District 427 - $25,504

County - $4,177

Town of Cortland - $3,856

CC 523 Kishwaukee - $2,611

Sycamore Fire - $1,366

Cortland Library, Road and Bridge, Township, FP - $2,651

SOLAR FARMS – DECOMMISSIONING

Town of Cortland Requirements

- Decommissioned within six months of the end of the project life
- Adjustments to the financial assurance amount shall be resubmitted every five (5) years and shall be adjusted for inflation and other factors
- Remove all above ground and below ground facilities of the approved SUP
- Restoration of soil and vegetation
- Decommissioning cost estimate: $344,558.12

Agricultural Impact Mitigation Agreement

Deconstruction within 6 months.

Removal of all racking systems, equipment and materials buried 5 feet or less (Transformer/Inverter pads, wires, cables, access roads).

Financial Assurance- reclamation/surety bond or other form.

Updated deconstruction plan to be provided at end of 10th year.

Summary of Solar Project Benefits

- Clean and reliable energy locally produced in Illinois
- Subscriptions to electricity at or below market rates
- Partner with workforce development organizations
- Provide support for training centers to create jobs
- Quiet and low-maintenance development
- Environmentally safe and pollution-free
- Significant property tax revenue for the community
- Economic benefits for our landowner and their family

Workforce Development and Solar Training for formerly impacted citizens

- A portion of the revenue from our projects goes toward workforce development programs. We work with partners to train and prepare citizens towards a career in the solar industry

Scholarships

- We have created scholarship funds for seniors from local communities in various counties around Illinois:
  - Illinois Valley Community College (Oglesby, IL)
  - Black Hawk College (Moline, IL)
  - Sherrard High School (Sherrard, IL)

Engagement with Community-Focused Organizations

- We work with local organizations to provide resources depending on the needs of the communities:
  - Northern Illinois Food Bank
  - Future Farmers of America
  - environmental groups such as Living Lands and Waters and Western Illinois Beekeepers