LAKE COUNTY ZONING BOARD OF APPEALS

CONDITIONAL USE PERMIT APPLICATION

Applicant(s): Owner: Frank Ryser Trustee,
Applicant/Contractor: Zion Community Energy Initiative LLC
(please print) Owner(s)

Subject Property:

Present Zoning: AG - Agricultural
Present Use: Farm Land
Proposed Use: Solar Farm
PIN(s): 0311200013, 0311200014
Address: 14280 9th Street Zion, IL 60099

Legal description: (_x_ see deed)

Request: I/we request a conditional use permit be approved to allow:

ECA Solar LLC d/b/a Zion Community Energy Initiative LLC, is requesting approval for a Conditional Use Permit to allow the development of a 4.50MWac ground-mounted community solar photovoltaic system on 28.8 acres of a 70.99-acre parcel located off Kilbourne Road in Zion Illinois in accordance with Section 151 of the Lake County Zoning Ordinance.

Explain why this conditional use permit is justified:

The proposed community solar project complies with the standards listed in Section 151 of the Lake County Zoning Ordinance and is a net positive to the community.

A community solar project of this size can power up to approximately 900 ComEd homes on clean renewable power. Additionally, the Project will contribute to local economic development by spending approximately 12.0 million in the Illinois economy and creating up to 10 full time job equivalents during construction and 2 full time job equivalents during operations and maintenance. The project will also generate hundreds of thousands of dollars in tax revenue over 35 years which will be applied to all local tax districts without straining public resources like emergency services, sewers, or schools.

APPLICANT INFORMATION

Owner (include all fee owners listed on deed):		**Authorized Agent:** I/we hereby authorize this person to represent me/us in all matters related to this application:	
Name:	Frank Ryser as successor trustee under Trust Agreement dated July 11, 1993	Name:	Atwell, LLC (Keri Williams, PE)
Address:	14280 West 9th Street	Address:	[redacted]
State/Zip:	Zion, IL 60099	State/Zip:	
Daytime Phone:	[redacted]	Daytime Phone:	
Email:		Email:	

Applicant (if other than owner):		**Contract Purchaser** (if any):	
Name:	Zion Community Energy (Tiffany Grace)	Name:	Zion Community Energy
Address:	[redacted]	Address:	[redacted]
State/Zip:		State/Zip:	
Daytime Phone:		Daytime Phone:	
Email:		Email:	

I/[redacted]e is true and complete to the best of my/our kn[redacted]

C[redacted] Owner's Signature

Signature(s) of contract purchasers (If applicable)

I, Lisa Burmeister a Notary Public aforesaid, do hereby certify that Frank Ryser, trustee personally known to me is (are) the person(s) who executed the foregoing instrument bearing the date of _____ and appeared before me this day in person and acknowledged that he/she/they signed, sealed and delivered the same instrument for the uses and purposes therein set forth.
Given under my hand and Notarial Seal this 6th day of September, 2024.

(Seal)

OFFICIAL SEAL
LISA BURMEISTER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES: 01/08/2027

My Commission expires 1/8/27

OFFICIAL SEAL
LISA BURMEISTER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES: 01/08/2027

COURT REPORTER AGREEMENT

CHECK ONE OF THE FOLLOWING:

☒ I authorize the County to act on my behalf to retain a Certified Shorthand Reporter to transcribe the public hearing and provide a transcript to the Zoning Board of Appeals. I further agree to pay the Reporter reasonable fees for his/her services. If I do not pay the Reporter and the County is invoiced and pays the Reporter, I agree to reimburse the County. If the County sues to obtain reimbursement, I agree to pay the County its reasonable attorney's fees in bringing suit and obtaining a judgment.

☐ I will furnish a Certified Shorthand Reporter to transcribe the public hearing and provide a transcript to the Zoning Board of Appeals. I realize that the failure to do so may result in the continuation of the public hearing in which case I agree to reimburse the County for all additional expenses caused by such continuation.

[redacted]

Signature

Billing Contact Information:

Michael Mahoney

Print Name

[redacted]

Email

[redacted]

Phone Number

THIS SIGNED AGREEMENT MUST ACCOMPANY YOUR APPLICATION

COMMERCIAL SOLAR ENERGY SYSTEMS
APPROVAL CRITERIA

Describe how your application meets the following criteria:

1. *Fencing.* Commercial solar energy systems shall be enclosed with an approved fence that restricts access to the public. Such fencing shall, at a minimum, encompass the entire system's facility, contain a locking mechanism, and be subject to the fence regulations of Lake County Code Section 151.113(L)(1). The maximum height of fences surrounding commercial solar energy systems shall be eight feet.

   A fence surrounds the entirety of the solar farm and is accessible by a 20' double swing gate. The fence height will not exceed eight feet and meets Lake County Code Section 151.113(L)(1). See fence details in Appendix G, sheet C-600.

2. *Height*. The total height of the panels shall not exceed 20 feet, as measured from grade to the highest point of the solar arrays when the solar energy facility's arrays are at full tilt.

   The total height of the panels shall not exceed 20 feet. See details in Appendix G, Sheet C-600.

3. *Location and setbacks*. Commercial solar energy systems must meet the setback requirements for a principal structure in the underlying zoning district or be waived by the written consent of the owner(s) of each affected nonparticipating property.

   All proposed solar setbacks meet or exceed the required solar zoning setbacks as shown on sheet C-200 of the Conditional Use Permit Plans.

4. *Decommissioning plan and assurances.* Applicant (or owner, if different from applicant) must submit a decommissioning plan with cost estimation to the County as part of the siting application and provide testimony supporting the calculation of costs provided in said plan during the public hearing on the application.

   Decommissioning plan and cost estimate are attached as part of this submittal. See Appendix L.

APPENDIX A

Health and Safety Impacts of Solar Photovoltaics

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 (SO_2), 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.

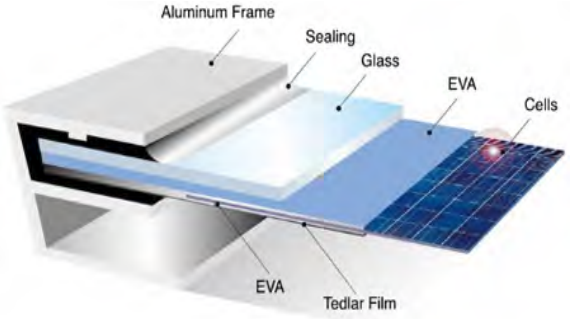

Figure 2: Components of crystalline silicon panels. The vast majority of silicon panels consist of a glass sheet on the topside with an aluminum frame providing structural support. Image Source: www.riteksolar.com.tw

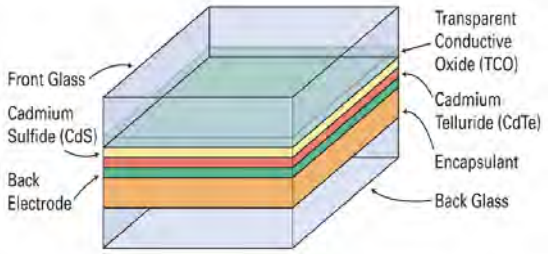

Figure 3: Layers of a common frameless thin-film panel (CdTe). Many thin film panels are frameless, including the most common thin-film panels, First Solar's CdTe. Frameless panels have protective glass on both the front and back of the panel. Layer thicknesses not to scale. Image Source: www.homepower.com

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 grass frit and the solder is the only part of silicon PV panels with a potential to create a negative health impact. However, as described below, the very limited amount of lead involved and its strong physical and chemical attachment to other components of the PV panel means that even in worst-case scenarios the health hazard it poses is insignificant.

As with many electronic industries, the solder in silicon PV panels has historically been a 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/panel[12], each panel contains one-half of the lead in a typical 12-gauge shotgun shell. This amount equates to roughly 1/750th of the lead in a single car battery. In a panel, it is all durably encapsulated from air or water for the full life of the panel.[14]

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

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

b. Cadmium Telluride (CdTe) PV Panels

This subsection examines the components of a cadmium telluride (CdTe) PV panel. Research demonstrates that they pose negligible toxicity risk to public health and safety while significantly reducing the public's exposure to cadmium by reducing coal emissions. As of mid-2016, a few hundred MWs of

cadmium telluride (CdTe) panels, all manufactured by the U.S. company First Solar, have been installed in North Carolina.

Questions about the potential health and environmental impacts from the use of this PV technology are related to the concern that these panels contain cadmium, a toxic heavy metal. However, scientific studies have shown that cadmium telluride differs from cadmium due to its high chemical and thermal stability.[19] Research has shown that the tiny amount of cadmium in these panels does not pose a health or safety risk.[20] Further, there are very compelling reasons to welcome its adoption due to reductions in unhealthy pollution associated with burning coal. Every GWh of electricity generated by burning coal produces about 4 grams of cadmium air emissions.[21] Even though North Carolina produces a significant fraction of our electricity from coal, electricity from solar offsets much more natural gas than coal due to natural gas plants being able to adjust their rate of production more easily and quickly. If solar electricity offsets 90% natural gas and 10% coal, each 5-megawatt (5 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 $1/100^{th}$ the toxicity of free cadmium.[25] Cadmium telluride is a very stable compound that is non-volatile and non-soluble in water. Even in the case of a fire, research shows that less than 0.1% of the cadmium is released when a CdTe panel is exposed to fire. The fire melts the glass and encapsulates over 99.9% of the cadmium in the molten glass.[27]

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

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

There is also concern of environmental impact resulting from potential catastrophic events involving CdTe PV panels. An analysis of worst-case scenarios for environmental impact from CdTe PV panels, including earthquakes, fires, and floods, was conducted by the University of Tokyo in 2013. After reviewing the extensive international body of research on CdTe PV technology, their report concluded, "Even in the worst-case scenarios, it is unlikely that the Cd concentrations in air and sea water will exceed the environmental regulation values."[35] In a worst-case scenario of damaged panels abandoned on the ground, insignificant amounts of cadmium will leach from the panels. This is because this scenario is

much less conducive (larger module pieces, less acidity) to leaching than the conditions of the EPA's TCLP test used to simulate landfill conditions, which CdTe panels pass.[36]

First Solar, a U.S. company, and the only significant supplier of CdTe panels, has a robust panel take-back and recycling program that has been operating commercially since 2005.[37] The company states that it is "committed to providing a commercially attractive recycling solution for photovoltaic (PV) power plant and module owners to help them meet their module (end of life) EOL obligation simply, 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 thought this directive exempts PV panels. The authors are unaware of any completed or proposed utility-scale system in North Carolina using CIS/CIGS panels.

1.2.3 Panel End-of-Life Management

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

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

Although modern panels can generally be landfilled, they can also be recycled. Even though recent waste volume has not been adequate to support significant PV-specific recycling infrastructure, the existing recycling industry in North Carolina reports that it recycles much of the current small volume of broken PV panels. In an informal survey conducted by the NC Clean Energy Technology Center survey in early 2016, seven of the eight large active North Carolina utility-scale solar developers surveyed reported that they send damaged panels back to the manufacturer and/or to a local recycler. Only one developer reported sending damaged panels to the landfill.

The developers reported at that time that they are usually paid a small amount per panel by local recycling firms. In early 2017, a PV developer reported that a local recycler was charging a small fee per panel to recycle damaged PV panels. The local recycling firm known to authors to accept PV panels described their current PV panel recycling practice as of early 2016 as removing the aluminum frame for local recycling and removing the wire leads for local copper recycling. The remainder of the panel is sent to a facility for processing the non-metallic portions of crushed vehicles, referred to as "fluff" in the recycling industry.[52] This processing within existing general recycling plants allows for significant material recovery of major components, including glass which is 80% of the module weight, but at lower yields than PV-specific recycling plants. Notably almost half of the material value in a PV panel is in the few grams of silver contained in almost every PV panel produced today. In the long-term, dedicated PV panel recycling plants can increase treatment capacities and maximize revenues resulting in better output quality and the ability to recover a greater fraction of the useful materials.[53] PV-specific panel recycling technologies have been researched and implemented to some extent for the past decade, and have been shown to be able to recover over 95% of PV material (semiconductor) and over 90% of the glass in a PV panel.[54]

A look at global PV recycling trends hints at the future possibilities of the practice in our country. Europe installed MW-scale volumes of PV years before the U.S. In 2007, a public-private partnership between the European Union and the solar industry set up a voluntary collection and recycling system called PV CYCLE. This arrangement was later made mandatory under the EU's WEEE directive, a program for waste electrical and electronic equipment.[55] Its member companies (PV panel producers) fully finance the association. This makes it possible for end-users to return the member companies' defective panels for recycling at any of the over 300 collection points around Europe without added costs. Additionally, PV CYCLE will pick up batches of 40 or more used panels at no cost to the user. This arrangement has been very successful, collecting and recycling over 13,000 tons by the end of 2015.[56]

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

The success of the PV panel collection and recycling practices in Europe provides promise for the future of recycling in the U.S. In mid-2016, the US Solar Energy Industry Association (SEIA) announced that they are starting a national solar panel recycling program with the guidance and support of many

leading PV panel producers.[58] The program will aggregate the services offered by recycling vendors and PV manufacturers, which will make it easier for consumers to select a cost-effective and environmentally responsible end-of-life management solution for their PV products. According to SEIA, they are planning the program in an effort to make the entire industry landfill-free. In addition to the national recycling network program, the program will provide a portal for system owners and consumers with information on how to responsibly recycle their PV systems.

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

1.2.4 Non-Panel System Components (racking, wiring, inverter, transformer)

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

The electrical transformers (to boost the inverter output voltage to the voltage of the utility connection point) do contain a liquid cooling oil. However, the fluid used for that function is either a 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 μT, but can vary considerably depending on a person's exposure to EMF from electrical devices and wiring.[69] At times we are often exposed to much higher ELF magnetic fields, for example when standing three feet from a refrigerator the ELF magnetic field is 6 mG and when standing three feet from a microwave oven the field is about 50 mG.[70] The strength of these fields diminish quickly with distance from the source, but when surrounded by electricity in our homes and other buildings moving away from one source moves you closer to another. However, unless you are inside of the fence at a utility-scale solar facility or electrical substation it is impossible to get very close to the EMF sources. Because of this, EMF levels at the fence of electrical substations containing high voltages and currents are considered "generally negligible".[71, 72]

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

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

3. Electric Shock and Arc Flash Hazards

There is a real danger of electric shock to anyone entering any of the electrical cabinets such as combiner boxes, disconnect switches, inverters, or transformers; or otherwise coming in contact with voltages over 50 Volts.[79] Another electrical hazard is an arc flash, which is an explosion of energy that can occur in a short circuit situation. This explosive release of energy causes a flash of heat and a shockwave, both of which can cause serious injury or death. Properly trained and equipped technicians and electricians know how to safely install, test, and repair PV systems, but there is always some risk of

injury when hazardous voltages and/or currents are present. Untrained individuals should not attempt to inspect, test, or repair any aspect of a PV system due to the potential for injury or death due to electric shock and arc flash, The National Electric Code (NEC) requires appropriate levels of warning signs on all electrical components based on the level of danger determined by the voltages and current potentials. The national electric code also requires the site to be secured from unauthorized visitors with either a six-foot chain link fence with three strands of barbed wire or an eight-foot fence, both with adequate hazard warning signs.

4. Fire Safety

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

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

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

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

- The International Association of Fire Fighters (IAFF) and International Renewable Energy Council (IREC) partnered to create an online training course that is far beyond the PowerPoint click-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.

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APPENDIX B

Real Estate Adjacent Property Value Impact Report

CohnReznick

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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:

Colin Walker
Project Development Manager
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[redacted]

Submitted By:

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Valuation Advisory Services
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Andrew R. Lines, MAI, CRE
Erin C. Bowen, MAI

July 12, 2024

LETTER OF TRANSMITTAL

July 12, 2024

Colin Walker
P[redacted]ger
[redacted]
[redacted]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 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 ECA Solar. Additional intended users of our findings include Monee Community Energy Initiative LLC and the client's legal and site development professionals. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP ("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:

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FINDINGS

I. Academic Studies *(pages 19-23):* 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 [redacted] ctions, and opinion surveys, for both residential homes ar[redacted], the majority of the [redacted]arious studies indica[redacted]asurable impact to [redacted]ery small impact to [redacted]ons, at[redacted]are not necessarily [redacted]

[redacted]dies: CohnReznick als[redacted]al 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 24-101)*: Further, CohnReznick has performed studies in 21 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 10 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	Power Output (MW AC)	Site Area (Acres)
1	2662 Freeport Solar CSG	Stephenson	IL	2.00	18
2	Grand Ridge Solar	LaSalle	IL	20.00	158
3	Spring Mill Solar	Lawrence	IN	1.10	9
4	Jefferson County Solar	Jefferson	CO	1.20	13.63
5	DTE Lapeer	LaPeer	MI	48.28	±365
6	Dominion Indy Solar III	Marion	IN	8.60	129
7	Sunfish Farm	Wake	NC	5.00	50
8	Portage Solar	Porter	IN	2.00	56
9	IMPA Frankton Solar	Madison	IN	1.40	13
10	Valparaiso Solar	Porter	IN	1.00	28

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

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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 102-104)*: Our conclusions also consider interviews with over 75 County and Township Assessors, [redacted] jurisdiction, and in which they have determined that solar [redacted] nt property values.

[redacted] uch, the Township [redacted] who she said that *th* *alues due to their* [redacted] *the* ***Grand Ridge So*** *Farm*.

- 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, where the **University of Illinois Solar Farm** is located, and he noted *there appears to have been no impact on property values as a result of proximity to the solar farm*.
- Cindi Lotz of Fayette County, Illinois did indicate that the **Dressor Plains Solar** project *has not had any impact whatsoever on adjacent property values.*

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 105-113)*: 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 reviewed does not indicate a negative impact on adjacent property based on proximity to a solar farm.

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If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Very truly yours,

CohnReznick LLP

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SCOPE OF WORK

CLIENT AND INTENDED USERS

The client and intended user of this report is ECA[redacted]Monee Community Energy Initiative LLC and the client's legal and sit[redacted]

INTENDED USE

[redacted]l concerns and to [redacted]odies are required to [redacted]t use applications. [redacted]lue any specific prope[redacted]t may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP ("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]

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EFFECTIVE DATE & DATE OF REPORT

July 12, 2024 (Paired sale analyses contained within each study are periodically updated.

PRIOR SERVICES

[redacted]

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.

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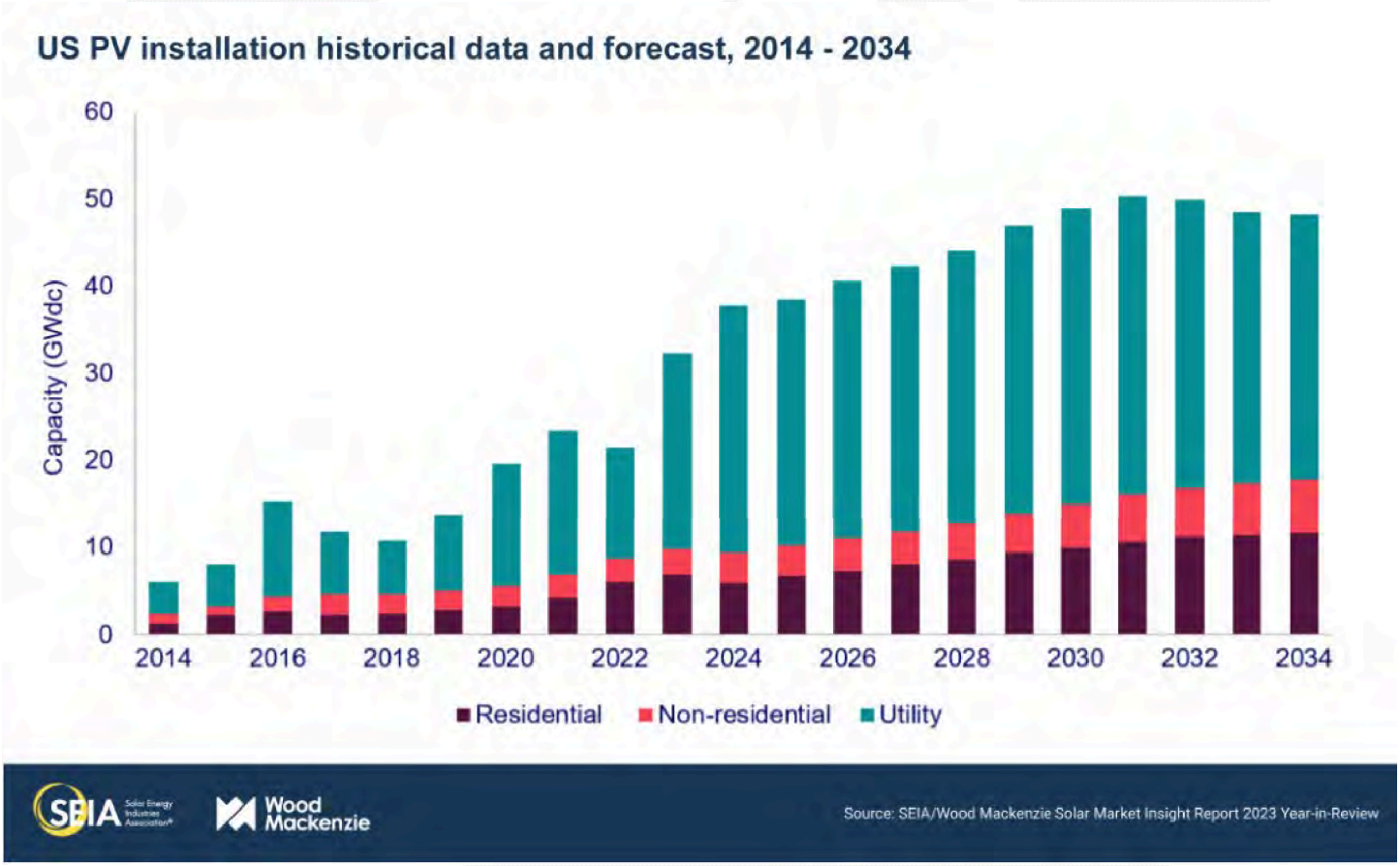
OVERVIEW OF SOLAR DEVELOPMENT IN THE UNITED STATES

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 percent 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 five years through 2028, with the largest percentage of installations attributed to utility-scale projects.



The U.S. installed 32.4 gigawatts (GWdc) of solar PV capacity in 2023, exceeding 30 GWdc of capacity for the first time. Solar has accounted for 53% of all new electricity-generating capacity added in the U.S. in 2023. Residential solar had another record year with 6.8 GWdc installed, a 13% increase from 2022. Utility-scale solar installations reached 22.5 GWdc, a 77% increase from 2022. Supply chain constraints are still present, but many delayed projects came online in 2023 as module shipments make their way to project sites.

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 will provide funds to states,

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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.

In response to the Inflation Reduction Act (IRA), [redacted] newly announced module manufacturing facilities in the US. As of th[redacted]cking 52 GW of new f[redacted] online by 2026, at lea[redacted]

[redacted]size. Between 2023 [redacted]ch stronger in the [redacted] technology of the [redacted] to the long-term polic[redacted]

Wood Mackenzie expects the industry to remain supply-constrained through at least the second half of this year. Equipment importers are still contending with detainments as they seek to provide the documentation needed for compliance with the Uyghur Forced Labor Prevention Act (UFLPA).

Once supply chain relief arrives, the true impacts of the Inflation Reduction Act will manifest in rapid development. Beginning in 2024, annual installations of solar will consistently reach 30-40 GWdc.

On December 2nd, 2022, the Department of Commerce issued a preliminary affirmative ruling in the anticircumvention case initiated earlier this year. While the ruling was not issued in time to allow for incorporation into our forecasts, new tariffs present a downside risk to our outlook.

As of August 12, 2022, the Inflation Reduction Act was passed in the Senate and The House of Representatives, which includes 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 remains present, the passage of the Inflation Reduction Act gives the solar industry long-term market certainty.

Recent articles show that over the past decade, the solar industry has experienced unprecedented growth. Among the factors contributing to its growth were government incentives, significant capacity additions from existing and new entrants and continual innovation. 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.[2] One of the bigger factors contributing to growth is the retirements of the existing fossil fleet driven by age and economics. and the more recent increase in demand for electricity driven by data centers, AI, and EVs and economic growth.

[2] "Electromagnetic Field and Public Health." Media Centre (2013): 1-4. World Health Organization.

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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 [redacted] tion of the system's life, the solar energy use does not burden schoo[redacted]e as it is a passive u[redacted] population as say a re[redacted] benefi[redacted] of the community. [redacted] turally. In the long [redacted] since the soil is allo[redacted] ghed and fertilized [redacted] an offer some financia[redacted] to 25 years. Once solar panel racking systems are removed, the land can revert to its original use.[3]

NATIONAL COMMUNITY SOLAR ENERGY PRODUCTION

As of May 2024, the U.S. produces over 1.294 million megawatts (MW) of power each year, according to the U.S. Energy Information Administration (EIA) in ±26,230 unique power generation facilities. Of that power produced, approximately 7.8 percent is generated from solar facilities, or 101,241.5 MW AC, at 6,568 solar facilities across the country, reflecting an average facility size of 15.40 MW AC. For community scale solar production, the number of facilities that generate 5 MW or less of power accounts for 64.0 percent of all solar facilities, nationwide, although only 7.8 percent of solar power generated in the country comes from community scale facilities, overall, totaling 7,897.6 MW. The community solar industry had a slow start to 2024 with 279 MW installed through Q1, an increase of one percent from Q1 2023 and a decrease of 32.0 percent from the previous quarter, according to SEIA data.

Community solar refers to local solar facilities shared by multiple community subscribers who receive credit on their electricity bills for their share of the power produced. There are 41 states, plus D.C., with at least one community solar project on-line, the next five years will see the U.S. community solar market is expected to remain positive with 5 percent average annual growth from 2024 to 2026 before contracting by 11 percent annually on average through 2029.

[3] NC State Extension. (May 2016). Landowner Solar Leasing: Contract Terms Explained. Retrieved from: https://content.ces.ncsu.edu/landowner-solar-leasing-contract-terms-explained

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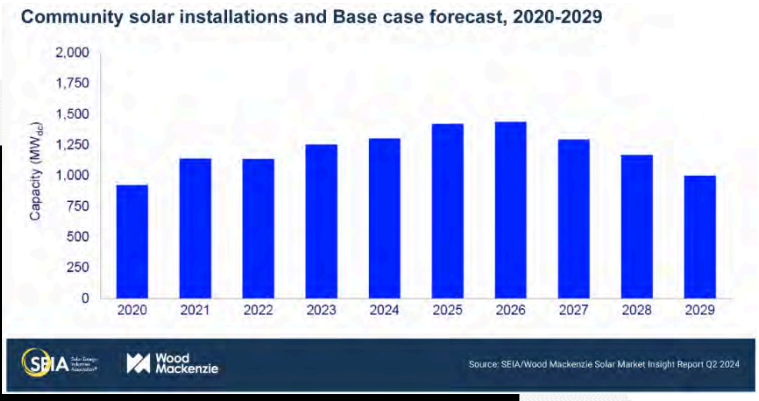
Community solar installations increased 1 percent year-over-year as of first quarter 2024, and installations are down from the fourth quarter 2023. Due to uncertainty around the anti-circumvention investigation, supply chain issues, and lon timelines for new community solar policie c s growth is expected 2029.



unity solar installatio kets - New York, Minnesota, and Massachusetts - a growing list of states with community solar programs have helped diversify the market, creating large pipelines set to come to fruition over the next several years.

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ENERGY PRODUCTION IN ILLINOIS

As of the end of Q1 2024, Illinois has 2,948 MW of solar installed, ranking 14th 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 7,948 MW of solar proposed to be installed over the next five years.

On January 27, 2023, Illinois Governor JB Pritzker signed a new law, Public Act 102-1123, which refines county governments' ability to regulate new commercial wind and solar energy facilities. Specifically, PA 102-1123 prohibits counties from banning or establishing moratoriums on wind and solar development. The law also establishes siting and zoning standards, which county ordinances may not be more stringent than, and standardizes procedures for counties' review and approval of wind and solar siting or special use permits.

Illinois is a growing solar market that has benefited from a strong renewable portfolio standard that requires Illinois generates 25% of their energy from renewable sources by 2025. The amount of solar capacity installed in Illinois is expected to grow by more than 269% over the next five years with a total of 7,948 MW planned over that time period. The largest new solar facility in Illinois will be a 1,200 MW AC utility scale installation projected to become operational in December 2027 in Lee County, that is being developed by Steward Creek Solar.

Illinois has several utility scale solar facilities in operation, one of which, the Grand Ridge Solar Farm that we have studied and included in our report. The remaining utility scale solar facilities include:

- The 9 MW Exelon Solar Chicago, completed in December 2009
- The 10 MW Northern Cardinal Solar Project, completed in February 2021
- The 9.9 MW AES Belleville Solar Project, completed in September 2021
- The 200 MW Prairie Wolf Solar, completed in November 2021
- The 149 MW Big River Solar, completed in August 2022
- The 99 MW Prairie State Solar Project, completed in July 2021
- The 99 MW Dressor Plains Solar projects, completed in September 2021

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- The 70 MW Mulligan Solar Project, completed in July 2022
- The 20 MW DePue Holdings Solar Project, completed in February 2023
- The 100 MW High Point Solar, completed in November 2023
- The 30 MW Prairie Creek Solar, completed in November 2023
- The 165.3 MW River Ferry Solar 1 Projec

[redacted] of Assessments for [redacted] en any transactions [redacted] s indicated that the [redacted] in wh [redacted] Illinois did indicate [redacted] y values. We have [redacted] g each of these newly [redacted] date, there are not [redacted] 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 148 existing solar projects in Illinois, 11 were completed between 2009 and 2019. A further 46 solar projects were completed in 2020 alone, followed by 64 in 2021, 13 in 2022, 13 in 2023 and one through May 2024. The solar projects completed in the last five years account for 94% of the total solar projects in the state and 62% since 2021. Nevertheless, we were able to study two existing solar projects in Illinois that had transactions after the completion of the solar project.

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APPRAISAL THEORY – ADAJCENT 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 [redacted] ement of value has occurred.[4] According to Dr. Bell:

> *[redacted] ally have a [redacted] a property's [redacted] operty, that [redacted] d sellers to [redacted] on pricing relative to [redacted] ributes that influence the value of that particular property."*[5]

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.[6] CohnReznick implemented the scientific method[7] to determine if a detrimental condition of proximity to a solar farm exists, further described in the next section.

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[4] Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Pages 1-2)
[5] Ibid, Page 314
[6] Ibid, Pages 7-8
[7] 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)

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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 [redacted]

[redacted] studies;

[redacted] may include repeat

[redacted] effective method of [redacted] 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."*[8]

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."[9] 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,[10] to determine if a detrimental impact has occurred.

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[8] Bell, Randall, PhD, MAI. *Real Estate Damages. Third ed.* Chicago, IL: Appraisal Institute, 2016. (Page 33)
[9] *The Appraisal of Real Estate 14th Edition.* Chicago, IL: Appraisal Institute, 2013.
[10] 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)

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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 [redacted]
   2.1. [redacted]sting solar farms com[redacted]
   [redacted] Con[redacted]
   [redacted] Sales;
   [redacted] of market value;
   [redacted] justing for market
   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

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methodology remains objective, and the only adjustment required is for market conditions;[11] 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")[12] 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.

[redacted] pric[redacted] market conditions [redacted] Area Sale(s). After [redacted] of a possible price [redacted]

- 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.

[11] 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."

[12] 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.

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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

[redacted] es due to proximity [redacted] ed in May 2018.[13] [redacted] y focusing on property [redacted] ssors with no sales data or evidence included in the survey. The opinion survey was sent to 400 accessors 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 statistic hedonic regression model may better identify impacts. It should be noted that the type of statistical analysis that the author states is required to determine "*actual property value impacts*' was completed two years later by the following Academic Studies.

ii. The second report 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*."[14] 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

[13] 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.lbl.gov/sites/default/files/property-value_impacts_near_utility-scale_solar_installations.pdf.

[14] 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/.

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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 [redacted] ***zero*** (a statistically insignificant 0.1%), and that the negative [redacted] curring in non-rural [redacted] study tested to dete [redacted] d values, and found [redacted] out any differences [redacted]

iii. The third report is a published 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 land owners 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."

iv. 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. We are still reviewing this article although it does note 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.

[15] The U of RI 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.

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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 que[redacted]y of the study as a whole:

[redacted]data [redacted] and whether those [redacted]consis[redacted]ties greater than 18 [redacted]s would show the [redacted]t. Moreover, this is not [redacted]er, our own studies [redacted]cilities in Minnesota (t[redacted]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.

v. In April 2024 **Lawrence Berkeley National Lab**, published a report titled Perceptions of Large-Scale Solar Project Neighbors: Results From a National Survey.[16] 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

[16] 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).

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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% re[redacted]de. 42% report that they would support additional LSS in t[redacted] would oppose it." [redacted]ort noted that "Rough[redacted]SS projects did not [redacted] around the largest [redacted] tende[redacted] some respondents [redacted]o unaware."

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."[17]

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

[17] Chisago County Press: County Board Real Estate Update Shows No "Solar Effects" (11/03/2017)

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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.*

CONCLUSION

[redacted] impact to property [redacted] conclu [redacted] udies utilizing large [redacted] ty values. Further, [redacted] irmed by county asse [redacted] adjacent land use' [redacted] alues.

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TECHNIQUE 2: PAIRED SALE ANALYSIS SOLAR FARM

SOLAR FARM 1: 2662 FREEPORT SOLAR CSG, STEPHENSON COUNTY, IL

Coordinates: Latitude 42.33941447101255, Longitude -89.6394781667045

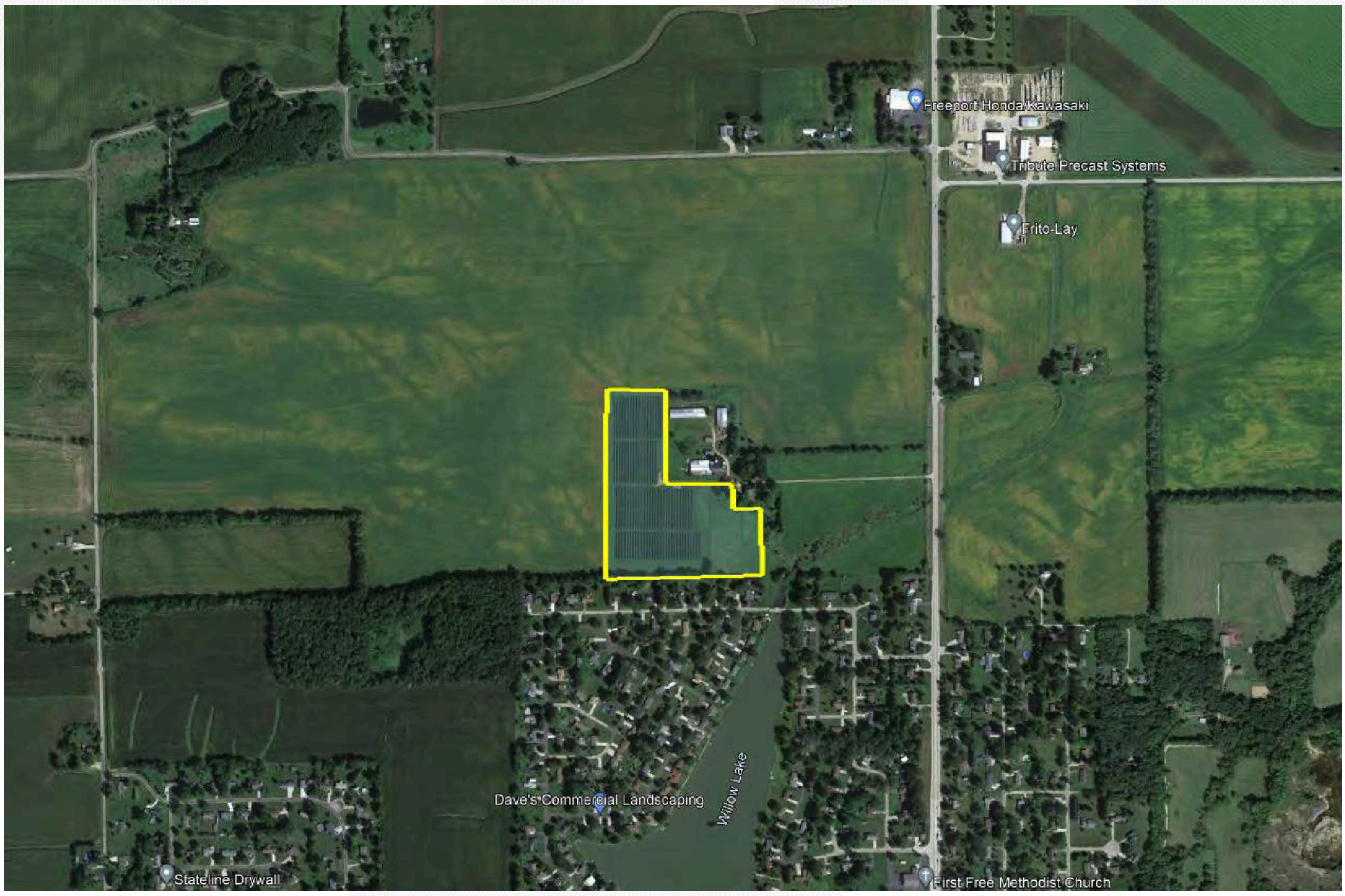
PIN: 08-00-13-800-001

Total Land Size: 17.84 acres

Date Project Announced: N/A

Date Project Completed: December 2020

Output: 2.0 MW AC



Approximate 2662 Freeport Solar CSG boundaries outlined in yellow, aerial imagery provided by Google Earth

2662 Freeport Solar CSG is located in Stephenson County, Illinois and is accessible via Illinois Route 26 N. The solar farm was developed by Borrego Solar Systems, Inc. and RECON Corporation and the improvements are owned by 2662 Freeport Solar I LLC. The solar farm went into operation in December 2020 with a total of 140,438

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square feet of solar panels. The 17.84-acre solar farm was located on a larger 45-acre parcel that was replatted in January 2021. The underlying land of the solar farm sold in May 2022 for $200,000, with a 20-year ground lease for the solar panels. The remaining portion of the parcel – 27.16 acres – includes a single-family home, farm buildings, and farmland and has an easement for access to the solar site.

The Surrounding Area: The 2662 Freeport Sol [redacted] on County, directly n[redacted]t. Stephenson County [redacted]ate of Illinois, along [redacted]port and 100 miles [redacted] project is one of 34[redacted]olar farms located [redacted]e 2662 Freeport Solar [redacted]existing solar farms in Illinois with the exception of seven that are significantly larger and have output ranging from 10 to 200 MW. All of the solar farms in Stephenson County have capacity of 2.0 MW, similar to 2662 Freeport Solar CSG.

The Immediate Area: The solar farm is located in between W. Winneshiek Road to the north, Jay Street to the south, Blumenthal Road to the west, and Route 26 N to the east. The solar site is surrounded by farmland to the north and west, farmland and farmhouse buildings to the east, and single-family homes in a community surrounding Willow Lake to the south. The parcel lines of the single-family homes to the south are lined with mature trees. The single-family home located adjacent to the east of the solar site is surrounded by mature trees while the farm buildings have direct views of the solar site.

Real Estate Tax Info: In 2021 (payable 2022), the assessed value of the improvements was $145,333 and the owner paid $16,038 in real estate taxes. The 2021 assessed value of the underlying land was $2,404 and the participating the landowner paid $265 in real estate taxes. Prior assessment and tax information was unavailable given the split of the parcels, and the previous assessment and taxes included the larger 45-acre site and structures.

Adjoining Parcels: The following map displays the parcel in the solar farm site (outlined in red). Properties adjoining the solar parcels are numbered for subsequent analysis.

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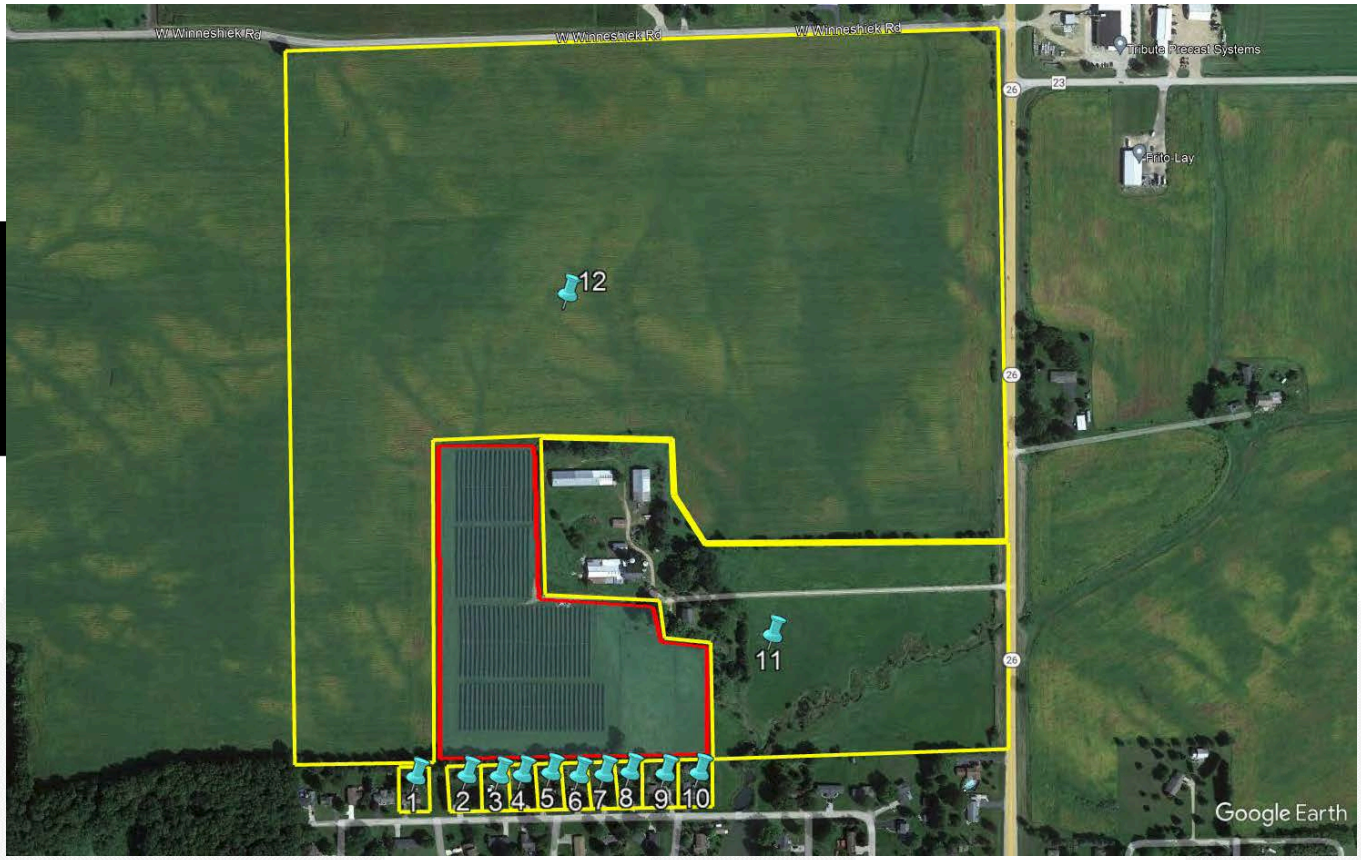

2662 Freeport Solar CSG - Adjoining Properties

The surrounding area is primarily populated with agricultural uses to the north, east, and west, and a single-family home residential community to the south. Some of the agricultural parcels contain homesteads on the site and others are fully unimproved.

Adjoining Properties 4, 6, 8, and 9 have no sales data. Therefore, Adjoining Properties 4, 6, 8, and 9 are excluded from further analysis.

Recall, the solar farm under analysis began operations in December 2020. Adjoining Properties 1, 3, 5, 7, and 12 were sold in 2003, 2019, 2002, 2012, and 2008, respectively. These sales did not occur within a reasonable time period prior to /completion. Therefore, Adjoining Properties 1, 3, 5, 7, and 12 were excluded from further analysis.

Adjoining Property 11 sold in December 2021 and is comprised of 27 acres. Adjoining Property 11 consists of the remaining portion of the solar farm's parcel that was subdivided in 2020. Adjoining Property 11 includes a farmhouse, farm buildings, farmland, and an easement for access to the solar farm. We searched Stephenson County for sales of similar properties to Sale 3 with large areas of farmland and farm buildings and only found two comparables sales more than 15 acres. We excluded Adjoining Property 11 as a Test Area Sale given the easement and limited comparable Control Area Sales.

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Therefore, we have only considered Adjoining Properties 2 and 10 for paired sales analysis (identified as Test Area Sales 1 and 2 going forward).

PAIRED SALES ANALYSIS

We considered only one type of paired sales anaylsis, 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). Test Area Sales 1 and 2 are located in the single-family residential subdivision ajdacent to the south of the solar farm and have been utilized as a group of test sales.

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 the 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. Additionally, these Control Area Sales are all located within a one mile radius of the 2662 Freeport Solar CSG project.

Test Area Sale 1 sold in November 2020 for $140,000 after being on the market for 40 days. The property is a single-story 1,750 square foot home with a 2-car attached garage, located on a 0.5-acre lot. The improvements on this property are located approximately 230 feet to the nearest solar panel while the property line is approximately 100 feet to the nearest solar panel. Test Area Sale 2 sold in January 2021 for $150,000 after being on the market for 51 days. The property is a one- to two-story 2,009 square foot home with a 2-car attached garage and 2.5-stall detached garage, located on a 0.5-acre lot. The improvements on this property are located approximately 330 feet to the nearest solar panel while the property line is approximately 280 feet to the nearest solar panel.

The table on the following page outlines the characteristics of the Test Area Sales.

Test Area Sale 1

Test Area Sale 2

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2662 Freeport Solar 1 CSG Test Area Sales										
Sale #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price/ SF	Sale Date
1	1424 Jay St. Freeport, IL 61032	$140,000	3	2.0 (1 full, 2 half)	1979	1,750	1-story SFH with 2-car attached garage	0.5	$80.00	Nov-20
2	1226 Jay St. Freeport, IL 61032	$150,000	3	2.5	1977	2,009	1-2 story SFH with 2-car attached garage and detached 2.5 stall garage	0.5	$74.66	Jan-21

[redacted] use that were not [redacted] e solar farm, that so [redacted] e date of the Test Area Sales. The Control Area Sales are single-family homes with three to four bedrooms and 2 to 2.5 baths, consist of between 1,200 square feet and 2,300 square feet of gross living area, and built between 1957 and 1993. The Control Area Sales have a partial unfinished basement or finished basement, and are located on lots between 0.3 and 0.6 acres in size.

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 2662 Freeport Solar CSG project is presented below.

CohnReznick Paired Sales Anaysis 2662 Freeport Solar 1 CSG		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (2)	Yes: Adjoining solar farm	$77.33
Control Area Sales (14)	No: Not adjoining solar farm	$76.08
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		1.65%

The marketing time (from list date to closing date) for Control Area Sales ranged from 16 to 87 days on market with a median of 61 days. The marketing time for to Test Area Sales ranged from 40 to 51 days, which is within the range of the Control Area Sales and below the median, ***and we note no substantial 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 2662 Freeport Solar CSG installation impacted the sale price of the Test Area Sales.

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We contacted the selling broker of Test Area Sale 2, Julie Wenzel of RE/MAX Town Lake & Country, who indicated that proximity to the solar farm did not impact the sale of the property.

Additionally, we spoke with Cami Grossenbacher, Stephenson County Deputy Assessor, who stated that there has been *no impact on property values due to the* [redacted] ***SG*** *project.*

[redacted]

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SOLAR FARM 2: 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

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 20 individual 1-MW solar inverters and over 155,000 photovoltaic solar panels 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%**

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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

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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, 6, 7, 13, and 14 have no sales data, therefore, those properties djoining Properties have been excluded from further analysis.

[redacted] announced on Decer[redacted]uly 2012. Adjoining [redacted]96, re[redacted]n a reasonable time [redacted]cluded from further [redacted]arch 2011 while const[redacted]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 the Bedeker Family Gift Trust. John and Susan Bedeker are owners of the Adjoining Property 1. 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 now known as Adjoining Propeprty 12, and the 35.07 acre farm, that was retained by the seller. 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, we have compared sales of similar properties not proximate to the solar farm (Control Area Sales) to the sales of the adjoining property (Test Area Sale), after the completion of the solar farm project.

Adjoining Property 12 (Test Area Sale) was considered for a paired sales analysis, and we analyzed this property as a single-family home use, 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 table on the following page 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

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We have found five Control Area Sales using data from 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 are com[redacted]d bracket Adjoining Property 12 reasonably [redacted]

Grand Ridge Solar: Test Area Sale Map

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, neither the announcement nor the completion of the solar farm use could 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 the Test Area Sale which was on the market for 169 days. This is an indication that the marketability of the Test Area Sale was not negatively influenced by proximity to the solar farm.

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We analyzed the five Control Area Sales and adjusted for market conditions using a regression analysis to identity the appropriate monthly market conditions adjustment. The results of the paired sales analysis for the Grand Ridge Solar Farm are presented below.

CohnReznick Paired Sales Anaysis Grand Ridge Solar Farm Adjoining Property 12		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sale (1)	[redacted]	
Control Area Sales (5)	[redacted]	
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 somewhat 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 days on market (5 – 6 months) compared to the Control Area Sales, which sold between 10 471 days on market (0 and 16 months).

Noting no negative price differential, it does not appear that the Grand Ridge Solar Farm impacted the sales price of the Test Area Sale, Adjoining Property 12. This was confirmed by the real estate agent who marketed and sold this home.

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SOLAR FARM 3: STOCKTON DG CSG SOLAR FARM, JO DAVIESS COUNTY, IL

Coordinates: Latitude 42.348183, Longitude -90.01124

PINs: 17-002-111-10, 17-002-111-20

Total Land Size: Approximately 23 Acres

[redacted]

Approximate Stockton DG CSG Solar boundaries outlined in yellow, aerial imagery provided by Google Earth dated May 2023

The Stockton Distributed Generation Community Solar Garden ("Stockton DG CSG" or "Stockton Solar") use is located in Jo Daviess County, Illinois. The solar farm is located in between Front Avenue to the north, Eugene Street to the south, S. Golf Road to the west and Ward Street to the east.

The current owner of the solar farm is IGS Stockton DG, LLC, who leases the land from Brewster Cheese Company operates a production facility on the same parcel as the Stockton Solar project, while IGS Energy

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developed the solar facility. The solar farm went into operation in December 2020 and provides energy for customers of Commonwealth Edison Co (Comed).

The Surrounding Area: The Stockton Solar installation is located in eastern Jo Daviess County, Illinois, in the southwest portion of the Village of Stockton, and [redacted] City of Rockford, in the northern portion of Ohio. The solar site is ap[redacted] of Dubuque, Iowa, a[redacted]he City of Rockford. T[redacted]st of the Iowa state [redacted] s located within Jo [redacted] unty with the Apple [redacted]h produces an output [redacted] farm in Jo Daviess County.

The Immediate Area: The solar farm spans over 22 acres in Jo Daviess County and is immediately surrounded by primarily agricultural land with residential homestead properties interspersed throughout the surrounding Project area. The solar farm is situated on a parcel owned by Brewster Cheese Company, who operates a cheese production facility on the site.

To the northeast lies more densely concentrated residential properties in the Village of Stockton, within one-mile from the Project site.

Real Estate Tax Info: Prior to the development of the solar farm two "child" parcels were created, from the "parent" parcel owned by Brewster Cheese Company, to assess the Stockton Solar project. The parcels on which the Stockton Solar project is located were not created until the solar farm was constructed and no taxes were paid for the 2020 tax year. In 2021, after the completion of the solar farm, the assessed value of the participating parcels increased to $296,800 and real estate taxes increased to $26,874.

Pin	Acres
Jo Daviess County, IL	
17-002-111-10	11.3
17-002-111-20	11.3
Total	22.7

2020 Taxes Paid	2021 Taxes Paid	Tax Increase
$0	$13,437	-
$0	$13,437	-
$0	$26,874	-

2020 Assessed Value	2021 Assessed Value	Value Increase
$0	$148,400	-
$0	$148,400	-
$0	$296,800	-

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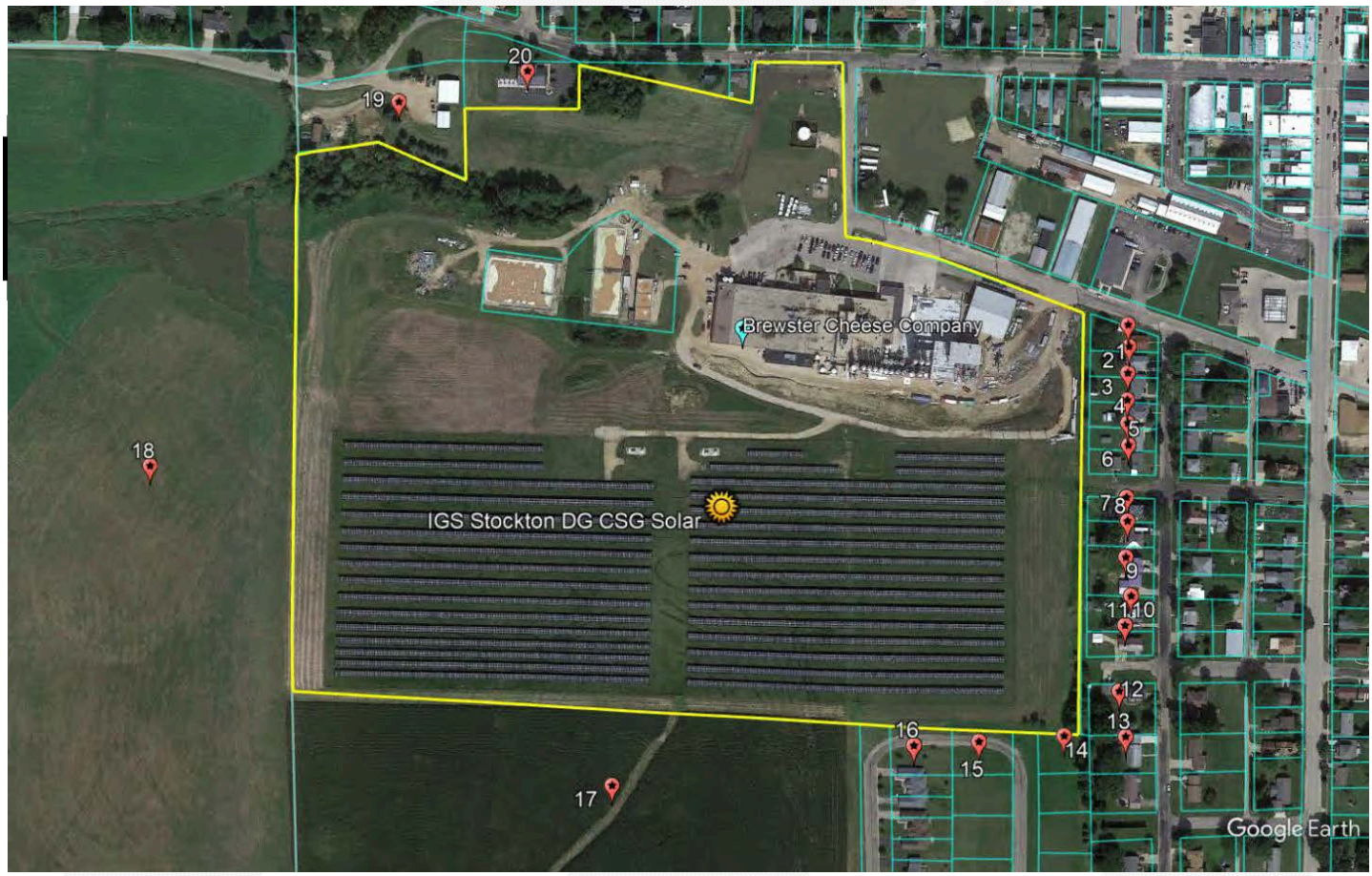
The following maps display the parcels developed with the solar farm (outlined in yellow). Properties immediately adjoining the solar parcels (outlined in blue) are numbered for subsequent analysis. It is noted that the aerial imagery provided by Google Earth is dated May 2023.



Stockton DG CSG Solar – Adjoining Properties

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 9 was sold on June 1, 2023 for $110,000 or $45.83 per square foot of living area, after being on the market. Adjoining Property 9 consisted of a 2-Story SFH with a 3-car attached garage built in 1954 on a 0.44-acre lot. We have not included the sale of Adjoining Property 9 as the transaction was non-arm's length.

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 6 to the Stockton DG CSG Solar Project was considered for a paired sales anaylsis, and we have anaylzed this property as a single-family home use in Group 1. The property is a single-story 960 sqaure foot home with a two car detached garage and a storage shed, located on a 0.22-acre lot that sold in July 2021.

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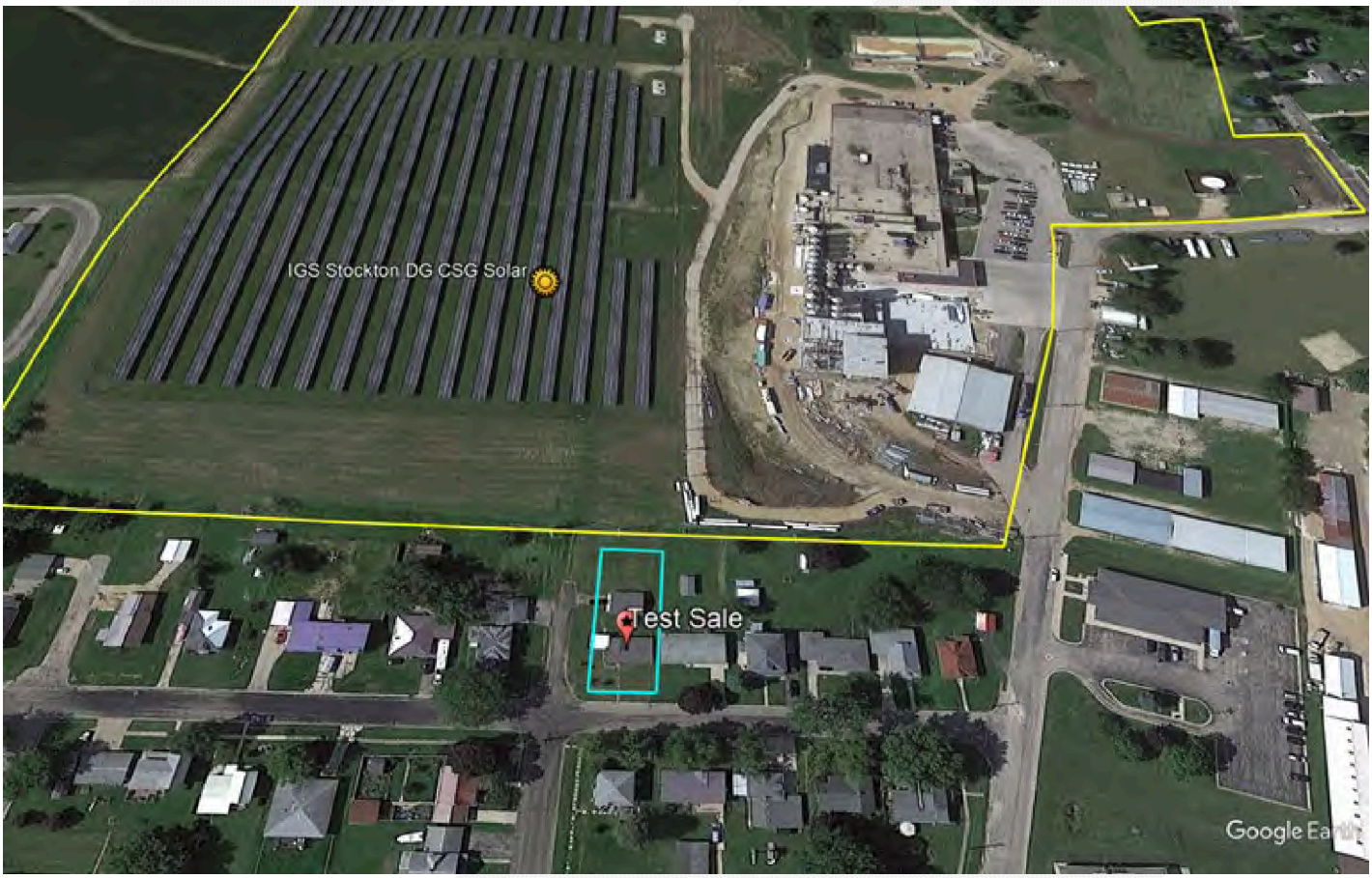
This property line is approximately 200 feet from the closest solar panel, and the improvements are approximately 250 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 6.

SUMMARY OF TEST AREA SALE Group 1 - Stockton DG CSG Solar										
Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
1	228 S. Ward Street, Stockton	$48,500	2	1.0	1923	960	1-Story SFH with 2-Car Detached Garage and Storage Shed	0.22	$50.52	Jul-21



Test Area Sale 1, aerial imagery provided by Google Earth, dated September 2022

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Test Area Sale 1, Red Arrow indicating location of Stockton DG CSG Solar Farm

We analyzed ten Control Area Sales of single-family homes with similar construction and use that were located within the Village of Stockton, 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 0.09 and 0.26-acres in size with one to three bedrooms and one to two baths, consisting of between 736 square feet and 1,416 square feet of gross living area, and built between 1910 and 1940.

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 Stockton DG CSG Solar Project – Group 1 is presented below.

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CohnReznick Paired Sale Analysis IGS Stockton DG CSG		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price PSF**
Test Area Sale (1)	Adjoining solar farm	$50.52
Control Area Sales (10)	No: Not adjoining solar farm	$52.20
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**-3.33%**

Noting no negative marketing time differential, Test Area Sale 1 sold in 74 days, while the Control Area Sales sold between 48 and 683 days, with a median time on market of 116 days.

The small differential between the Test Area Sale and Control Area Sales is within the range of normal market variace, and therefore it does not appear that the Stockton DG CSG installation impacted the sale price of the Test Area Sale.

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SOLAR FARM 4: SPRING MILL SOLAR, LAWRENCE COUNTY, IN

Coordinates: Latitude 38.709545, Longitude -89.46968

PINs: 47-14-12-800-078.019-004

Population Density, Lawrence County (2023): [redacted]

[redacted]tember 2017

Output: 1.1 MW AC

Approximate Spring Mill Solar boundaries outlined in yellow, aerial imagery provided by Google Earth dated October 2019

The Spring Mill Solar project is located in Lawrence County, Indiana and is in between Parks Implement Road to the north, Indiana State Road 37 to the east and is bisected by Clover Lane.

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The current owner of the solar farm is Hoosier Energy Rural Electric Cooperative, Inc., an electric cooperative with ten solar installations, including Spring Mill Solar, within the States of Indiana and Illinois. Hoosier Energy REC, Inc. only serves its' members as a cooperative and is not for-profit, like a majority of major electrical utilities. The solar farm went into operation in September 2017 and is comprised of nearly 4,000 panels.

The Surrounding Area: The Spring Mill Solar [redacted] ce County, Indiana, a[redacted]uth of the City of Bedf[redacted]. Lawrence County [redacted] in the world located [redacted] a pros[redacted]one Mining Industry [redacted] s northwest of the [redacted]nwest of the City of Inc[redacted]e City of Cincinnati.

The Spring Mill Solar project is one of the 92 solar farms in Indiana and is the sole solar farm located within Lawrence County, Indiana. The Spring Mill Solar project is one of the smaller solar farms in Indiana, with the largest solar farms in the state being the 265 MW Dunn's Bridge Solar farm in Jasper County, the Riverstart Solar Park in Randolph County and the Indiana Crossroads Solar Park in White County, which both produce an output of 200 MW.

The Immediate Area: The solar farm is bisected by Clover Lane and is located along Indiana-37 to the east. The solar farm is immediately surrounded by primarily vacant agricultural land with residential homestead properties interspersed to the east and west. Approximately one and a half miles to the north lies more densely concentrated residential and commercial properties in the City of Mitchell.

Real Estate Tax Info: In Lawrence County, Indiana, real property is assessed on annual basis as of January 1 each year. The Notice of Assessment is typically sent out to property owners in April of each year and Property tax bills are then due the following May 10th and November 13th for the preceding tax year. In the State of Indiana, land utilized for solar projects have an additional increase to the assessed land value or, "Solar Base Rate", which is set by the State and ranged from $5,000 to $13,000 per acre in 2022.

Prior to the development of the solar farm, the underlying land was part of a larger parent parcel (47-14-12-800-033.000-004*) that is 55.67-acres in size and was split to create a new parcel on which the Spring Mill Solar facility was constructed (47-14-12-800-078.019-004).

In 2017, prior to the property being assessed as a solar farm, the assessed value of the land was $79,500 and ownership paid $2,251 in real estate taxes. In 2018, the assessed value increased 131.57 percent to $184,100 and the real estate tax increased to $3,459, an increase in tax revenue of 53.71 percent.

Pin	Acres
47-14-12-800-078.019-004	8.56
47-14-12-800-033.000-004*	55.67*
Total	8.56

2017 Taxes Paid	2018 Taxes Paid	Tax Increase
-	$3,459	53.71%
$2,251	-	-
$2,251	$3,459	53.71%

2017 Assessed Value	2018 Assessed Value	Value Increase
-	$184,100	131.57%
$79,500	-	-
$79,500	$184,100	131.57%

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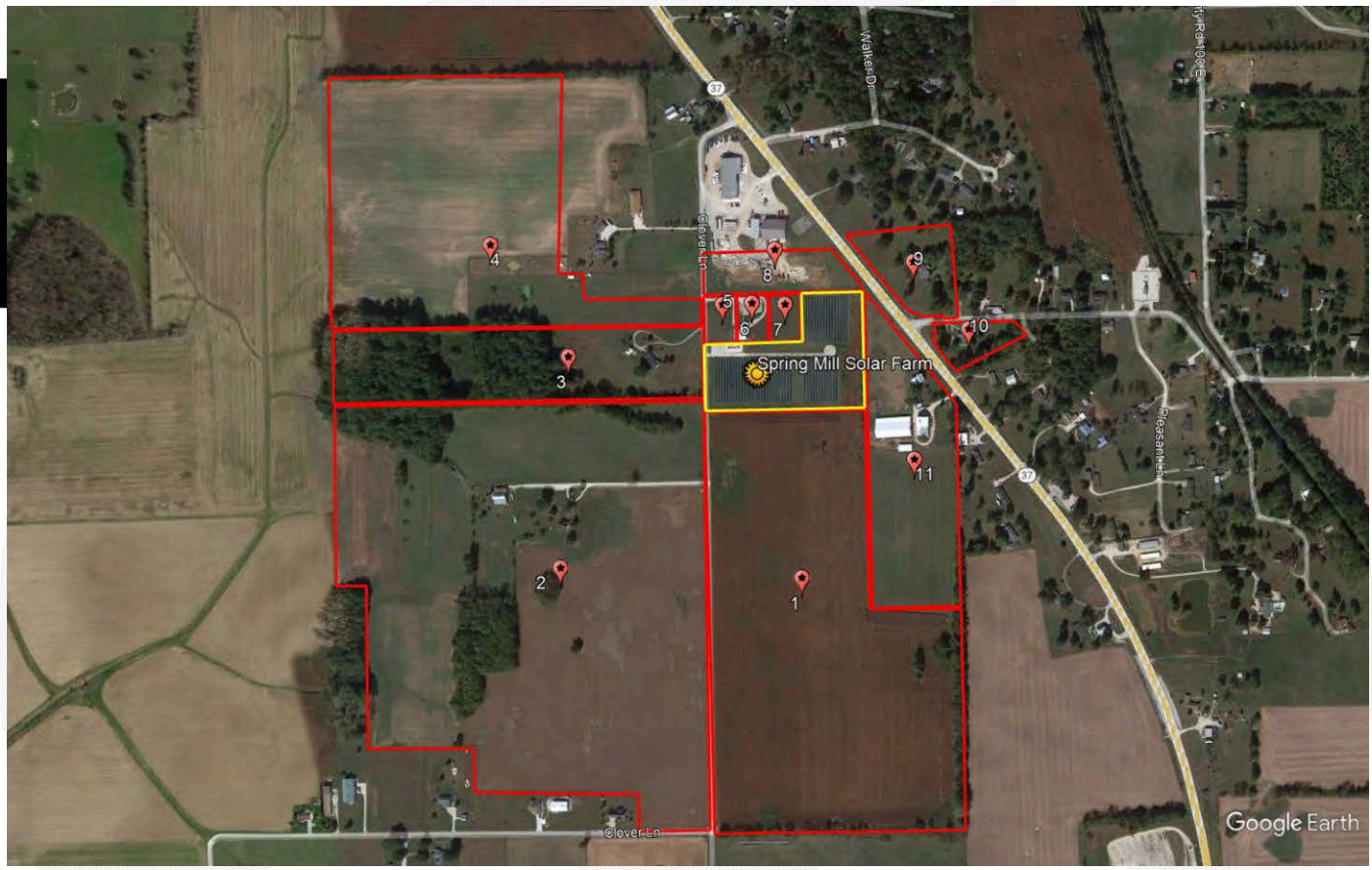
The following maps display the parcels developed with the solar farm (outlined in yellow). Properties immediately adjoining the solar parcels (outlined in red) are numbered for subsequent analysis. It is noted that the most recent and available aerial imagery provided by Google Earth is dated October 2019.



Spring Mill Solar – Adjoining Properties

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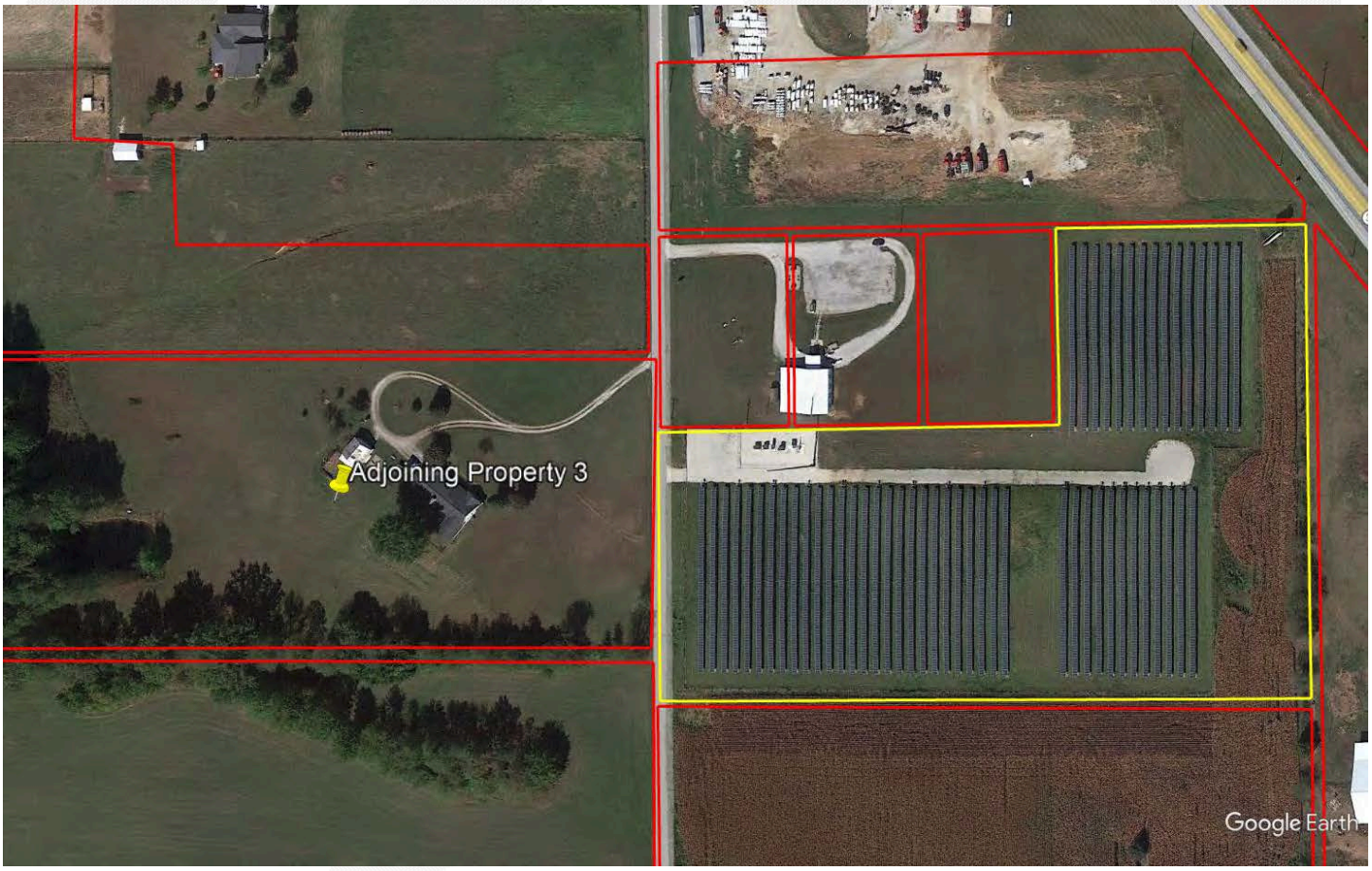
PAIRED SALES ANALYSIS

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 3 to the Spring Mill Solar Project was considered for a paired sales anaylsis, and we have anaylzed this property as a single-family home u[redacted], 2,710 sqaure foot h[redacted]age and a pole barn ([redacted] sale), located on a [redacted] prope[redacted] closest solar panel, [redacted] g table outlines the

SUMMARY OF TEST AREA SALE Group 1 - Spring Mill Solar										
Adj .Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
3	1933 Clover Lane, Mitchell	$265,000	3	2.5	1972	2,710	1-Story SFH with Attached Garage and Pole Barn (in need of roof replacement)	17.50	$97.79	Jun-21



Spring Mill Solar Farm – Test Area Sale Map, Group 1

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We analyzed seven Control Area Sales of single-family homes with similar construction and use that were located within Lawrence, Orange, Washington, Martin and Jackson Counties, that were not located in close proximity to Spring Mill Solar, 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 between 5.5- and 17.25-acres in size with three to four bedrooms and tw[redacted]05 square feet and 3,016 square feet of gross living area, and built be[redacted]ales also have two-c[redacted]ajority of the Control A[redacted]e barns, workshops [redacted]ce Agency's House [redacted], repeated-sales inde[redacted] in repeat sales or [redacted]erties. The result of [redacted]arm – Group 1 is presented below.

CohnReznick Paired Sale Analysis Spring Mill Solar Group 1		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sale (1)	Adjoining solar farm	$97.79
Control Area Sales (7)	No: Not adjoining solar farm	$100.84
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**-3.03%**

We spoke with Christina Root, listing agent for 1933 Clover Lane, who stated that the buyers were very familiar with the area and *were not concerned about the adjacent* ***Spring Mill Solar Farm***. Additionally, Ms. Root indicated that the Spring Mill Solar Farm had *no impact on the final sale price* as the property sold for its' listed price after just over one month on the market.

We note that the Test Area Sale in Group 1 included a pole barn with a roof needing replacement at the time of sale and none of the control sales indicated having deferred maintenance when sold.

Noting no negative marketing time differential, Test Area Sale 1 sold in 55 days, while the Control Area Sales sold between 34 and 68 days, with a median time on market of 43 days. Additionally, the Control Area Sales sold between 2.87 percent below to 1.89 percent above their listing price while Test Area Sale 1 sold at its' listing price, which is within the range of the Control Area Sales.

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 Spring Mill Solar Farm impacted the sale price of the Test Area Sale. We note that the control data had a higher median year built, representing more recently constructed residences, which likely explains the relative difference in adjusted median price per square foot.

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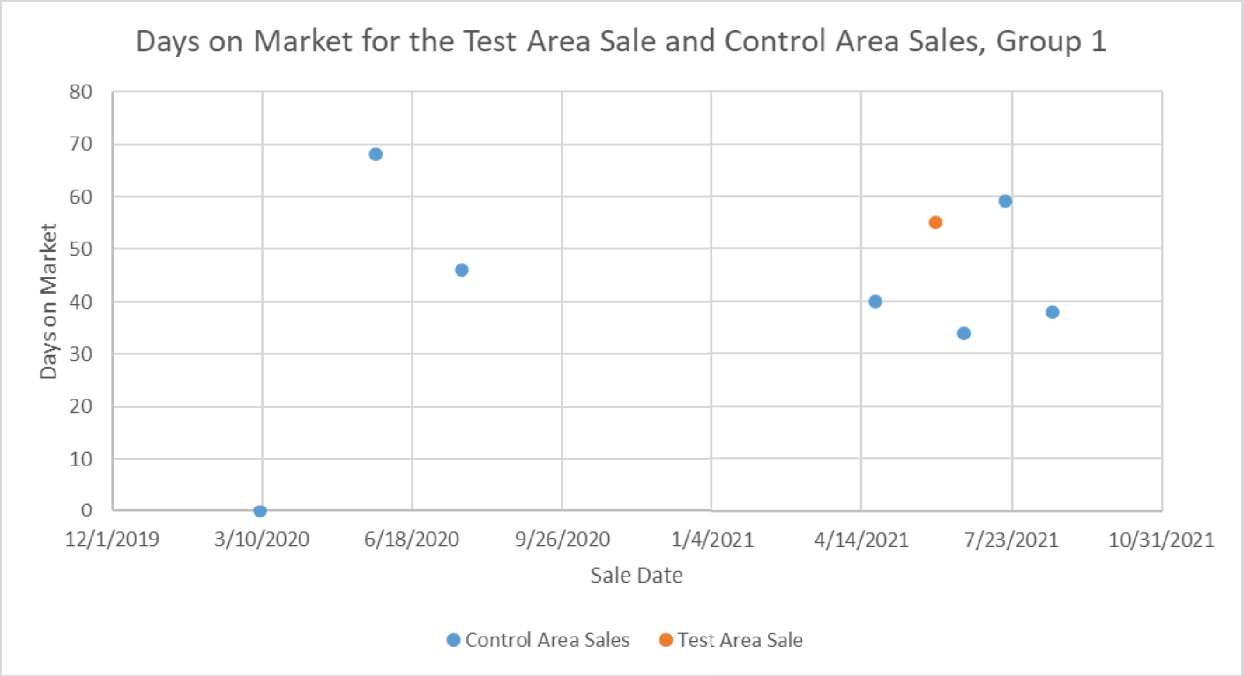

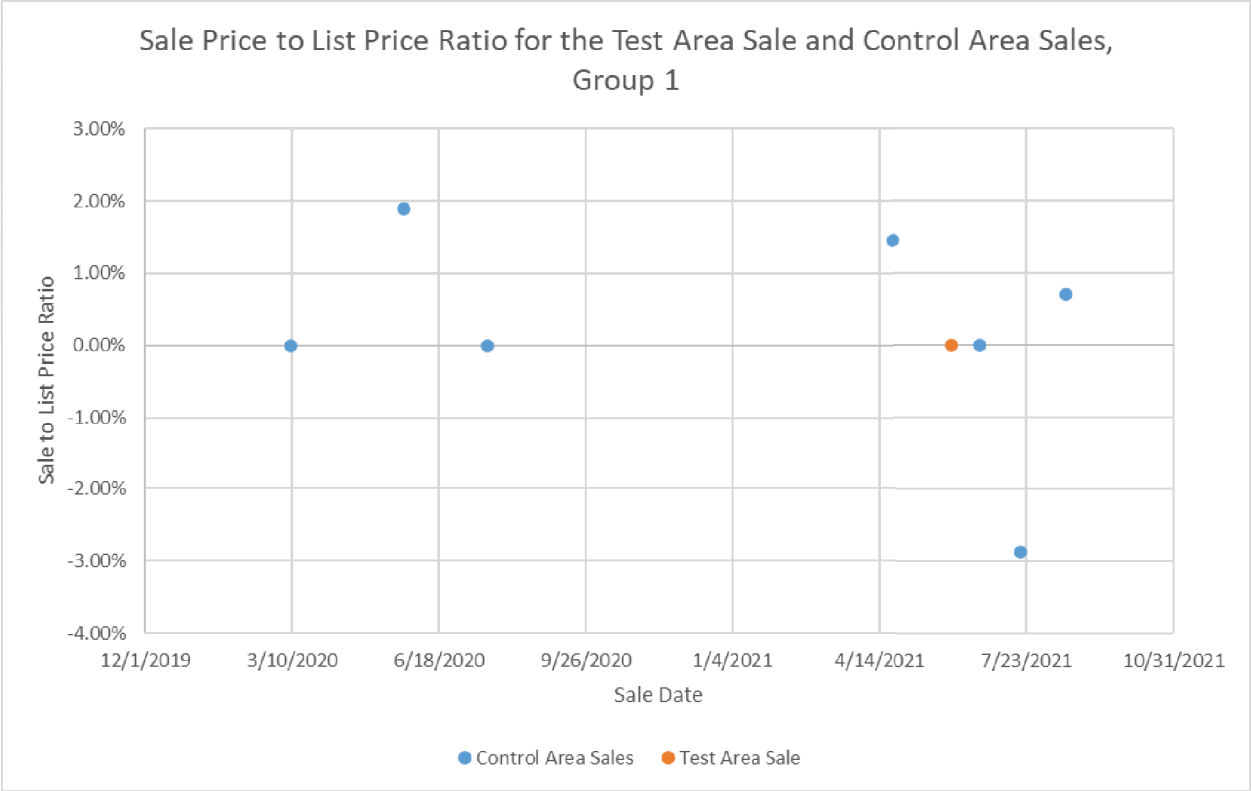

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Group 2 – Improved Single-Family Residential Properties

Adjoining Property 10 to the Spring Mill 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 2,706 square foot home with an attached garage and pole barn, located [redacted] The improvements on this property are located approximately 575 [redacted] he property line is a [redacted] e nearest solar panel. [redacted] rtant characteristics [redacted]

SUMMARY OF TEST AREA SALE Group 2 - Spring Mill Solar										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
25	42 Gun Club Road, Mitchell	$299,000	3	2.5	1974	2,706	1-Story SFH with Attached Garage and Pole Barn	1.43	$110.50	Aug-23

We analyzed 15 Control Area Sales of single-family homes with similar construction and 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 2. The Control Area Sales for Group 2 are single-family homes located on lots inbetween 0.5 and 2.72-acres in size with three to four bedrooms and two to three baths, consisting of between 2,200 square feet and 3,140 square feet of gross living area, and built between 1964 and 1983. The Control Area Sales also have two-car garage parking and a majority of the Control Area Sales have farm structures such as pole barns, workshops or utility 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 Spring Mill Solar Farm – Group 2 is presented below.

CohnReznick Paired Sale Analysis Spring Mill Solar Group 2		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sale (1)	Adjoining solar farm	$110.50
Control Area Sales (15)	No: Not adjoining solar farm	$102.03
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**8.30%**

Noting no negative price differential, it does not appear that the Spring Mill Solar Farm use impacted the sale of the Test Area Sale, Adjoining Property 10.

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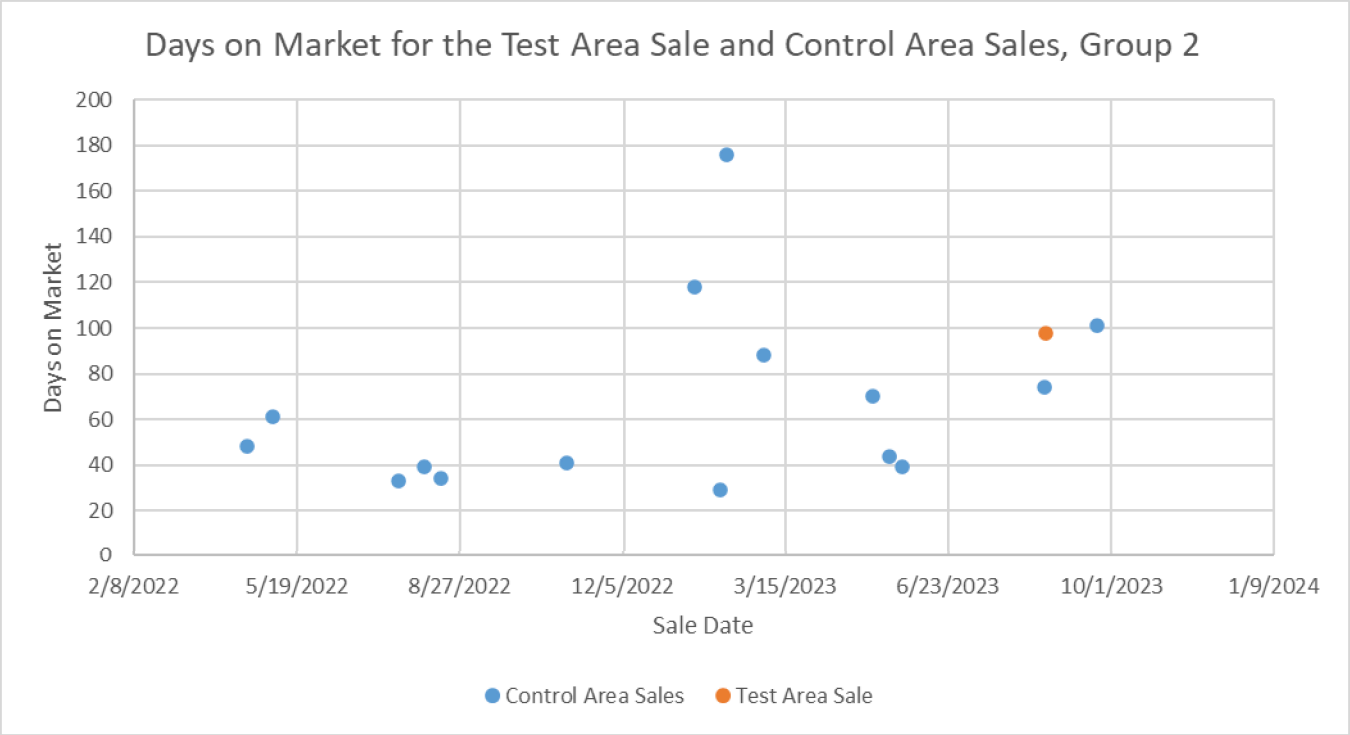
Noting no negative marketing time differential, Test Area Sale 2 sold in 98 days, while the Control Area Sales sold between 29 and 176 days. Additionally, the Control Area Sales sold for between 8.94 percent below to 4.05 percent above their listing price while Test Area Sale 2 sold for 5.08 percent less than its' listing price, which is within the range of the Control Area Sales.



Before & After Analysis – Assembly Solar Farm

We note the Test Area Sale in Group 2 of the Spring Mill Solar Farm Study (Adjoining Property 10) as well as seven Control Area Sales have sold at least twice over the past five years. To determine if any of the rates of appreciation for these identified home sales were affected by the proximity to the Spring Mill Solar Farm, we prepared a Repeat-Sales Analysis on the 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 Indiana's 474 Three Digit Zip Code, where Adjoining Property 10 is located, over the same period. The index for the zip code is measured on a quarterly basis and is presented in the following table.

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474 Three Digit Zip Code - Housing Pricce Index Change (Quarter over Quarter) Not Seasonally Adjusted			
Three-Digit ZIP Code	Year	Quarter	Index (NSA)
474	20[redacted]		
474	20[redacted]		
[redacted]	[redacted]		
[redacted]	20[redacted]		
[redacted]	[redacted]		
[redacted]	[redacted]		
[redacted]	2018		
474	2018		
474	2018	4	204.61
474	2019	1	207.15
474	2019	2	213.58
474	2019	3	216.22
474	2019	4	221.52
474	2020	1	223.34
474	2020	2	225.46
474	2020	3	227.72
474	2020	4	233.87
474	2021	1	239.4
474	2021	2	255.49
474	2021	3	264.07
474	2021	4	271.71
474	2022	1	281.21
474	2022	2	302.74
474	2022	3	305.83
474	2022	4	305.51
474	2023	1	299.43
474	2023	2	315.26

We have presented the full repeat sales analysis on the following page.

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Repeat Sales Analysis - Test Area Sales											474 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	Months Elapsed Between Sales	Monthly Appreciation Rate
10	42 Gun Club Road	1.43	2,706	8/22/2023	$299,000	10/30/2018	$190,000	57.37%	58	0.79%	58	0.75%

Repeat Sales Analysis - Control Area Sales											474 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	Months Elapsed Between Sales	Monthly Appreciation Rate
1-5	2458 Rabbitsville Road	14.96	2,526	5/25/2020	$275,000	6/6/2018	$185,000	48.65%	24	1.69%	24	0.45%
1-7	4338 Williams Road	7.72	2,914	8/19/2021	$302,000	8/9/2018	$229,900	31.36%	36	0.75%	36	0.72%
2-2	361 Johnson Lane	1.00	2,666	5/18/2023	$217,500	6/10/2022	$209,900	3.62%	11	0.32%	11	0.36%
2-5	309 3rd Street	1.21	2,664	3/2/2023	$252,000	1/28/2019	$177,900	41.65%	49	0.71%	49	0.75%
2-10	1803 Linwood Drive	0.59	2,200	8/15/2022	$304,900	7/11/2019	$180,000	69.39%	37	1.43%	37	0.94%
2-11	6877 State Road 54W	1.62	2,600	10/31/2022	$332,500	6/22/2020	$172,000	93.31%	28	2.36%	28	1.08%
2-13	508 Knoll Drive	1.01	2,778	5/8/2023	$450,000	10/29/2020	$350,000	28.57%	30	0.83%	30	0.99%
	Median - Control Area Sales	*1.21*	*2,664*							*0.83%*		*0.75%*

Conclusion

When compared to the FHFA home price index for the 474-zip code, the median extraction rate for the resale of Adjoining Property 10, that sold twice in the previous five years, exhibited a higher rate of appreciation than the Home Price Index for the 474-zip code. Additionally, the monthly appreciation rate of the Adjoining Property 10 was in line with 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 Spring Mill Solar Farm.

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CohnReznick

SOLAR FARM 5: JEFFERSON COUNTY COMMUNITY SOLAR GARDEN, JEFFERSON COUNTY, CO

Coordinates: Latitude 39.859564, Longitude -105.1497

PIN: 29-194-01-037

Total Land Size: 13.63 acres

Date Project Announced: November 2013

Date Project Completed: May 2016

Output: 1.2 MW AC

The Jefferson County Community Solar Garden is adjacent to the Whisper Creek residential subdivision, just outside the City of Arvada, and was developed by SunShare Management. This solar farm has the capacity for 1.2 Megawatts (AC) of power, which is enough to power 300 homes. After two months of operation, the solar farm was 100 percent subscribed and its three largest customers are the cities of Arvada and Northglenn, as well as the Green Mountain Water and Sanitation District.

The Surrounding Area: The Whisper Creek subdivision is located between the Welton Reservoir to the west and Standley Lake to the east. To the northwest of the subdivision lies the Colorado Hills Open Space and the Rocky Flats national Wildlife Refuge. The subdivision is primarily in the City of Arvada city limits, but the municipal

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boundary splits the street the Test Area Sales are located on, West 89th Loop, some are in Arvada and some are in unincorporated Jefferson County. Arvada is a northwestern suburb of the City of Denver and is accessible via Interstate-25 and Interstate-70 and Interstate-76.

The Immediate Area: The immediate area has uses that consist of vacant land to the north and east, a horse and alpaca farm to the south, known as Evening Star Farms, and single-family homes and a municipal police station and vacant land to the west.

Real Estate Tax Information: In 2017, real estate taxes totaled $79.10 for the entire parcel for the year, which is slightly less than taxes billed in 2016 and 2015.

The map below displays the solar farm parcel (outlined in yellow) and the Adjoining Properties (outlined in red) are numbered for subsequent analysis.

Jefferson County Community Solar Garden - Adjoining Properties
Aerial Imagery provided by Google Earth, dated May 2023
(Green Arrow – Direction of Photos on Following Page)

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.

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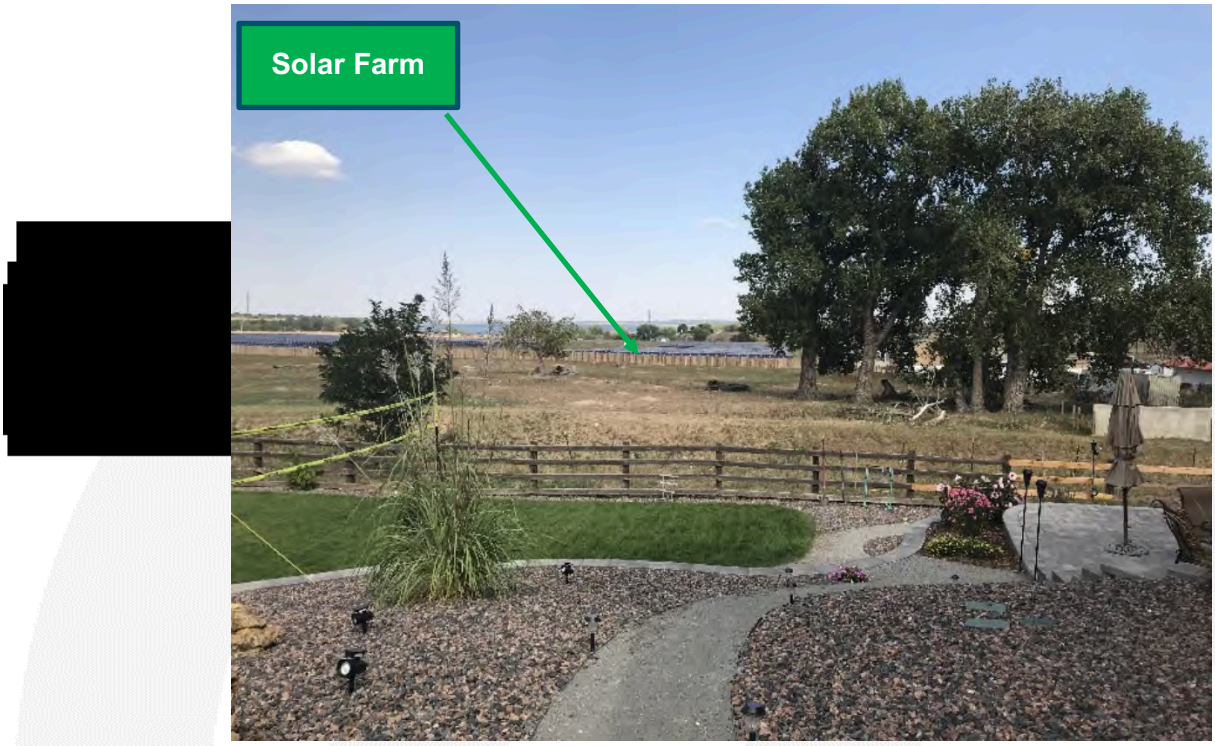
One adjoining residential property, Adjoining Property 11, was sold on June 7, 2022 for $900,000 or $446.21 per square foot of living area. Adjoining Property 11 is comprised of a single-story single family home with an unfinished basement and three-car attached garage, built in 2015 on a 0.21-acre lot. We have not included the sale of Adjoining Property 11 after speaking with the selling broker, Thomas Barron of A+ Realty Group, ***who noted this was a non-arm's length transactio*** [redacted] ***traded properties to avoid the hard costs involved financing th*** [redacted] ***n also stated that t*** [redacted] ***oppnly marketed an*** [redacted] ***bout the adjacent*** [redacted] [redacted] [redacted]



View from the rear of a Test Area Sale, towards Solar Farm

Group 1 – Improved Single-Family Residential Properties

Adjoining Properties 1, 5 and 9 to the Jefferson County Community Solar project were considered for a paired sales analysis, and we have analyzed these properties as a single-family home use in Group 1. The properties are two-story single-family homes with two- and three-car attached garages and basement areas, ranging from 3,201 square feet to 3,461 square feet of living area and are located on lots under one-acre in size within the Whisper Creek subdivision. The improvements on these properties are located between approximately 725 feet and 950 feet to the nearest solar panel while the property lines are between approximately between 685 feet and 860 feet to the nearest solar panel. The following table outlines the other important characteristics of Adjoining Properties 1, 5 and 9.

SUMMARY OF TEST AREA SALES
Group 1 - Jefferson County Community Solar Garden

Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
1	8958 Devinney Ct	$980,000	5	4.5	2011	3,201	2-Story SFH with Finished Basement and 3-Car Attached Garage	0.53	$306.15	Aug-20
5	8918 Devinney Court	$895,000	4	3.5	2014	3,202	2-Story SFH with Unfinished Basement and 3-Car Attached Garage	0.39	$279.51	Nov-20
9	13929 W. 89th Loop	$1,100,000	4	3.5	2016	3,461	2-Story SFH with Unfinished Basement and 2-Car Attached Garage	0.24	$317.83	Aug-21

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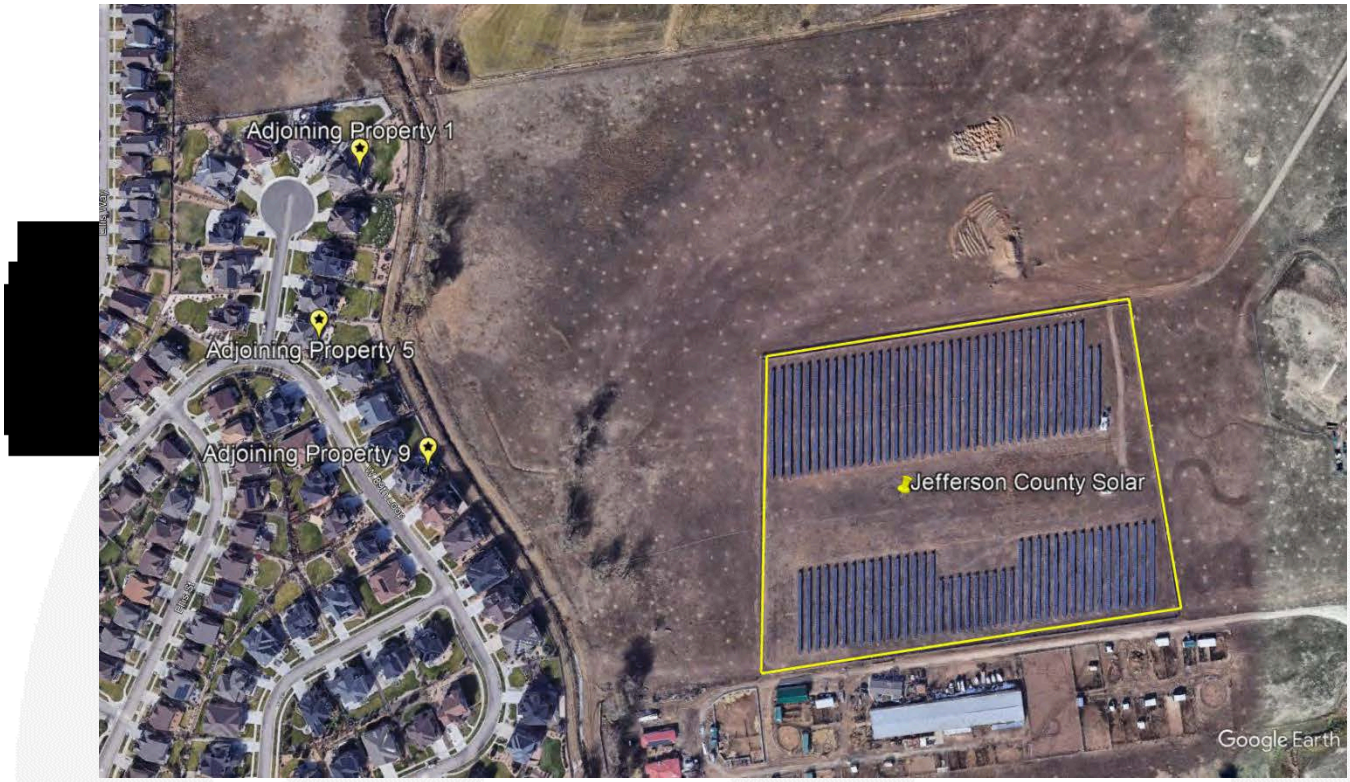

Jefferson County Community Solar Farm – Test Area Sale Map, Group 1

We analyzed twelve Control Area Sales of single-family homes with similar construction and use that were located within the Whisper Creek Subdivision and not adjacent 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 two-story single-family homes located on lots less than 1.0-acre in size with four to five bedrooms and three and a half to four and a half baths, consisting of between 2,700 square feet and 3,900 square feet of gross living area, and built between 2009 and 2016. The Control Area Sales also have additional improvements such as attached garage parking and basement areas. It is noted that while we searched for all home sales within these parameters, of the twelve Control Area Sales included in Group 1 only three have lot size above 0.30-acres whereas, the three Test Area Sales had lots sizes of 0.53-acres, 0.39-acres and 0.24-acres. Additionally, other potential Control Area Sales within the Whisper Creek subdivision with more comparable lot sizes to the Test Area Sales consisted of significant differences in bed and bath count or square feet of gross living area and have not been included in Group 1.

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 Jefferson County Community Solar Project – Group 1 is presented on the following page.

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CohnReznick Paired Sale Analysis Group 1 - Jefferson County Community Solar Garden		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sales (3)	Adjoining solar farm	$306.15
Control Area Sales (12)	No: Not adjoining solar farm	$270.00
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**13.39%**

Noting no negative marketing time differential, Adjoining Properties 1, 5 and 9 sold after between 33 days and 106 days on the market, with a median time on market of 62 days, while the Control Area Sales sold between 12 and 271 days, with a median time on market of 58 days.

Noting no negative price differential, with Adjoining Properties 1, 5 and 9 having a higher unit sale price than the Control Area Sales, it does not appear that the Jefferson County Community Solar Farm had any negative impact on the sale of the Test Area Sale.

We note that the Control Area Sales consisted of slightly smaller lot sizes, with a median lot size of 0.25-acres compared to a median lot size of 0.39-acres for the Test Area Sales, which likely explains the relative difference in adjusted median price per square foot.

Group 2 – Improved Single-Family Residential Properties

Adjoining Property 17 to the Jefferson County Community Solar project was considered for a paired sales analysis, and we have analyzed this property as a single-family home use on agricultural zoned land in Group 2. The property consists of two single-story dwellings totaling 4,675 square feet with attached garage parking and various outbuildings utilized for horse ranching, located on a 9.79-acre lot and sold in August 2023. The improvements on this property are located approximately 80 feet to the nearest solar panel while the property line is approximately 30 feet to the nearest solar panel. The following table outlines the other important characteristics of Adjoining Property 17.

SUMMARY OF TEST AREA SALE Group 2 - Jefferson County Community Solar Garden										
Property #	**Address**	**Sale Price**	**Beds**	**Baths**	**Year Built**	**Home Size (SF)**	**Improvements**	**Site Size (AC)**	**Sale Price / SF**	**Sale Date**
17	8895 Alkire Street	$1,650,000	4	2.5	1978 & 1987	4,675	Two Single-Story SFH's with Attached Garages and No Basements; Horse Arena, Loafing Shed, Paddocks and Tack Room	9.79	$352.94	Aug-23

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Jefferson County Community Solar Farm – Test Area Sale Map, Group 2

We analyzed four Control Area Sales of single-family homes with similar construction and use that were located within Jefferson County 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 agricultural zoned land, located on lots in between 5.00 and 11.00-acres in size, with three to four bedrooms and two to four baths, consisting of between 4,000 square feet and 4,700 square feet of gross living area, and built between 1972 and 1987. The Control Area Sales also have additional improvements such as garage parking, pole barns, workshops or outbuildings utilized for horse ranching .

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 Jefferson County Community Solar Project – Group 2 is presented on the following page.

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CohnReznick Paired Sale Analysis Group 2 - Jefferson County Community Solar Garden		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sale (1)	Adjoining solar farm	$352.94
Control Area Sales (4)	No: Not adjoining solar farm	$356.89
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**-1.11%**

The marketing time (from list date to closing date) for Control Area Sales ranged from 75 to 736 days on market with a median of 90 days on market, and the marketing time for Adjoining Property 17 was 307 days, which is within the range of the Control Area Sales, ***and we note no substantial marketing time differential.***

Noting minimal negative price differential, it does not appear that the Jefferson County Community Solar Farm use impacted the sale of the Test Area Sale, Adjoining Property 17.

This was confirmed by the buying agent, Eugene Mitchell of Signature Real Estate Corp., who stated, ***"My client was not deterred from buying the property due to the adjacent solar farm. I have not seen an indication that the solar farm has any negative impact nor have I heard from other local brokers that it is a concern among potential buyers."*** Additionally, we discussed the marketing of Adjoining Property 17 with the listing agent, Asa Kortman of Keller Williams Realty, who stated, "The original list price of $2,300,000 was too aggressive but insisted upon by my client. After six months we decreased the list price to $1,600,000 in April of 2023 and the property attracted four competing offers, ultimately selling after 121 days and above the new listing price." The Test Area Sale is located on agricultural zoned land which restricts the potential uses on the land and limits higher density commercial or residential development. The selling party of the Test Area Sale set the original list price based on similarly sized properties with non-agricultural zoned land ultimately leading to a large decrease in list price after not attracting offers at $2,300,000.

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Group 3 – Improved Single-Family Residential Properties

Adjoining properties 9, 10 & 13 are two-story, single-family residential homes with four bedrooms and three and a half bathrooms, between 3,000 and 4,000 square feet of gross living area, on less than 0.30 acre of land, and each sold in 2016 as new construction homes.

Group 3 - Jefferson County Community Solar Garden Test Area Sales									
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
9, 10, 13	13929 W 89TH LOOP, 13919 W 89TH LOOP, 13889 W 89TH LOOP	$635,500	0.23	4	3.5	2016	3,848	Jun-16	$165.15

The Test Area Sales are located between 595 feet and 720 feet from the house to the solar panels. We analyzed six Control Area Sales of single-family homes that are included in this analysis that sold within a reasonable time frame from the median sale date of the Test Area Sales and are similar to the Test Area Sales in physical characteristics. The Control Area Sales are removed from the solar panels and not adjoining, in other areas of the Whisper Creek subdivision.

Jefferson County Community Solar Farm – Test Area Sale Map, Group 3

All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.

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The results of our analyses for the Jefferson County Community Solar Garden are presented below.

CohnReznick Paired Sale Analysis Group 3 - Jefferson County Community Solar Garden		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sales (3)	Adjoining solar farm	$165.15
Control Area Sales (6)	No: Not Adjoining solar farm	$164.36
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		**0.48%**

Noting no negative price differential, it does not appear that the Jefferson County Community Solar Garden had any negative impact on adjacent property values.

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Before & After Analysis – Jefferson County Community Solar Farm

We note a Test Area Sale in Groups 1 and 3 of the Jefferson County Community Solar Farm (Adjoining Property 9) has sold at least twice over approximately the past five years. To determine if any of the rates of appreciation for these identified home sales were affected by [redacted] munity Solar Farm, we prepared a Repeat-Sales Analysis on the [redacted] calculated the total a[redacted] sale of the same pro[redacted] between each sale, [redacted] ates reflected in the [redacted] Home[redacted] it Zip Code, where [redacted] over the same per[redacted] red on a quarterly [redacted]

800 Three Digit Zip Code - Housing Pricce Index Change (Quarter over Quarter) Not Seasonally Adjusted			
Three-Digit ZIP Code	Year	Quarter	Index (NSA)
800	2016	1	246.20
800	2016	2	257.04
800	2016	3	264.47
800	2016	4	269.06
800	2017	1	274.73
800	2017	2	285.57
800	2017	3	290.87
800	2017	4	294.57
800	2018	1	302.96
800	2018	2	311.49
800	2018	3	314.90
800	2018	4	315.14
800	2019	1	319.79
800	2019	2	324.21
800	2019	3	326.15
800	2019	4	328.49
800	2020	1	330.57
800	2020	2	335.39
800	2020	3	342.51
800	2020	4	348.90
800	2021	1	359.07
800	2021	2	384.17
800	2021	3	409.73
800	2021	4	420.22
800	2022	1	438.10
800	2022	2	474.74
800	2022	3	466.26
800	2022	4	449.45
800	2023	1	457.65
800	2023	2	466.78
800	2023	3	469.38

We have presented the full repeat sales analysis on the following page.

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Repeat Sales Analysis											800 Three Digit Zip Code - FHFA Housing Price Index			
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
9	13929 W. 89th Loop	0.53	3,461	8/10/2021	$1,100,000	6/17/2016	$636,332	72.87%	62	0.89%	409.73	257.04	59.40%	0.76%

Conclusion

When compared to the FHFA home price index for the 800-zip code, the extraction rate for the resale of Adjoining Property 9, that sold twice times in the previous five years, exhibited a higher rate of appreciation than the Home Price Index for the 800-zip code. As such, we have concluded that there does not appear to be a consistent detrimental impact on properties adjacent to the Jefferson County Community Solar Farm.

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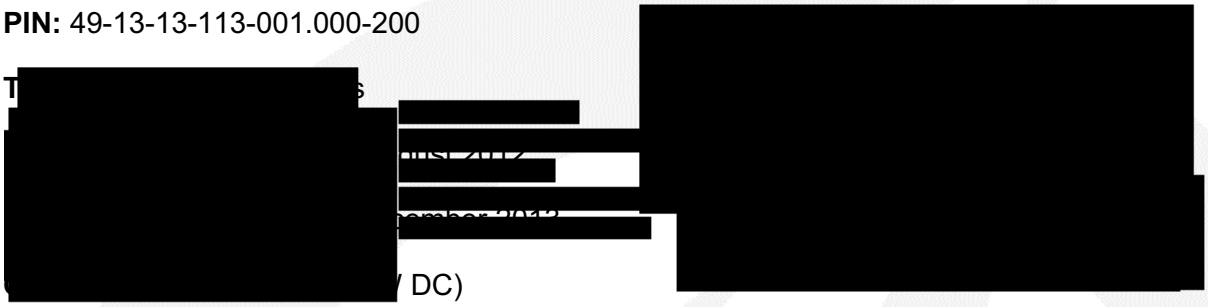
SOLAR FARM 6: DOMINION INDY SOLAR III, MARION COUNTY, INDIANA

Coordinates: Latitude 39°39'14.16"N, Longitude 86°15'35.06"W

PIN: 49-13-13-113-001.000-200



The Dominion Indy III solar farm was developed by Dominion Renewable Energy and became operable in December 2013. This solar farm has ground-mounted solar panels and has the capacity for 8.6 Megawatts (MW) AC of power. The panels are mounted in a fixed tilt fashion with 12 inverters.

The Surrounding Area: The Dominion Indy III solar farm is located in Decatur Township, in the southwest portion of Marion County, Indiana. The solar farm is approximately 10 miles southeast of the Indianapolis International Airport and approximately eight and a half miles from the center of Indianapolis.

The Immediate Area: The solar installation is on the southern side of West Southport Road. Adjoining parcels to the west, south, and east are agricultural in nature, actively farmed primarily with row crops and large areas of mature trees. There is one single family home on 4.78 acres of land at the northwest corner of the solar site, with frontage on West Southport Road, identified in our analysis as Adjoining Property 9.

To the north, across West Southport Road from the solar site, is the single-family residential subdivision known as Crossfield. Originally developed with over 81 acres of land by the Key Life Insurance Company, the one- and two-story homes in the subdivision were built between approximately 1998 and 2011.

All of the adjacent land parcels to the solar farm are used for agricultural or residential purposes.

The solar farm is surrounded by a chain link fence around all of the solar panels. Additionally, there are some natural shrubs and trees on all sides of the property; this vegetation was in place before the solar farm was developed.

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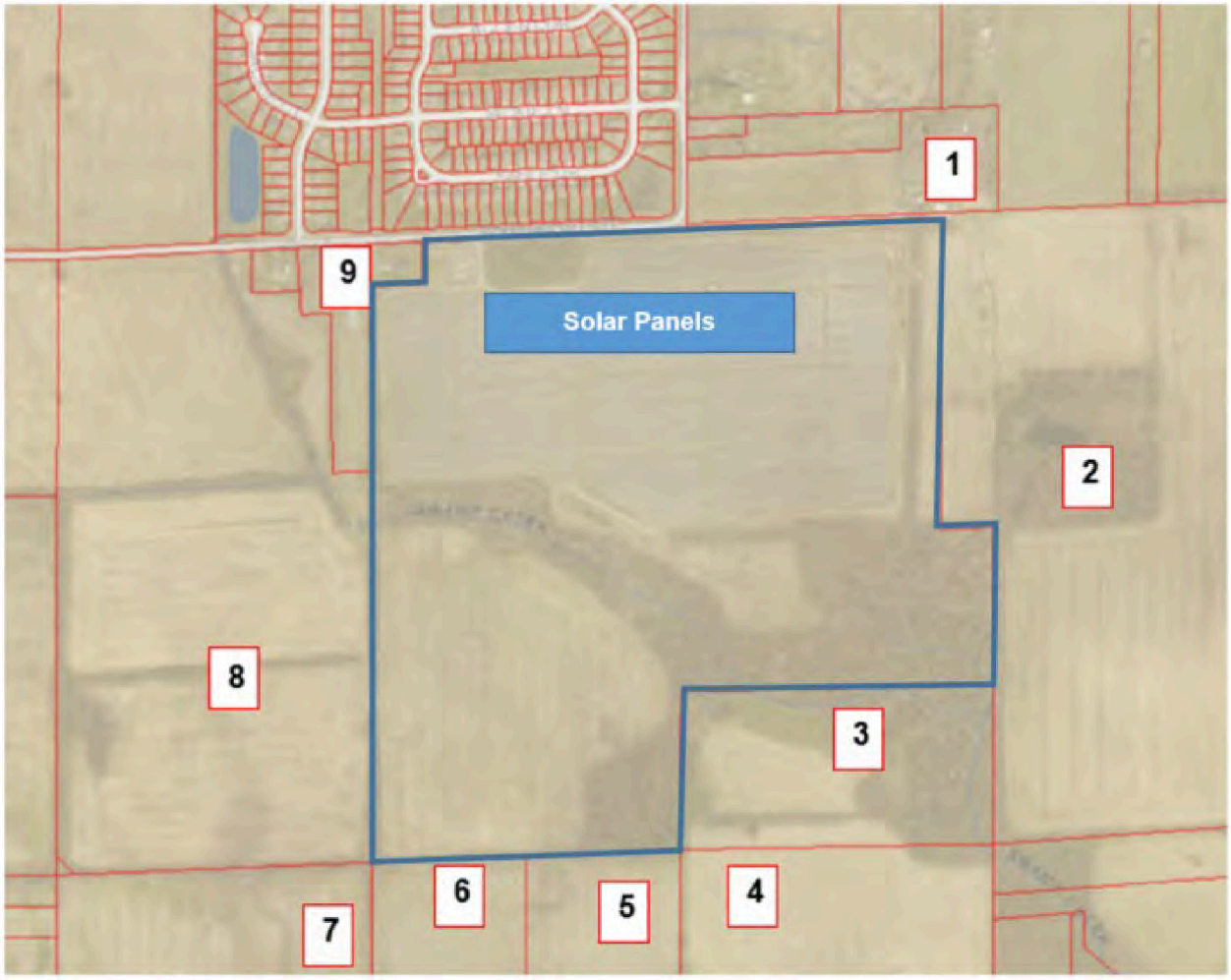
Real Estate Tax Information: Prior to development of the solar farm, in 2013, the owner of this 129-acre site paid real estate taxes of $1,788 annually. After development of the solar farm development, in 2015, real estate taxes increased to approximately $16,405, an 818 percent increase in tax revenue for the site.

PIN	Acres	2013 Taxes Paid	2015 Taxes Paid	Tax Increase	2013 Assessed Value	2015 Assessed Value	Value Increase
Marion County, IN 49-13-13-113-001.000-200	129.04	$ 1,788	$ 16,405	818%	$ 89,400	$ 109,900	23%
TOTAL	**129.04**	**$ 1,788**	**$ 16,405**	**818%**	**$ 89,400**	**$ 109,900**	**23%**

The map below, and the maps on the following pages, display the parcels within the solar farm is located (outlined in blue). Properties adjoining this site are numbered for subsequent analysis.



Dominion Indy III - Adjoining Properties

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PAIRED SALES ANALYSIS

We have considered two types of paired sales analysis with regards to the Dominion Indy III solar farm. The first compares sales of Adjoining Properties (Test Area Sales) to the solar farm after the completion of the solar farm site to similar properties not proximate to the sola[redacted] type of paired sale analysis for all three groups of Adjoining Properti[redacted]

T[redacted] kno[redacted] compares sales of [redacted] sales of the same [redacted] se home sale data [redacted] nport Road, for this [redacted]

GROUP 1

Adjoining Property 2 is a vacant 86.96-acre agricultural parcel located to the east of the solar site. Adjoining Property 2 sold in October 2017 and was considered for a paired sale analysis, known as a Test Area Sale, in Group 1.

The property line of this unimproved parcel is approximately 166 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 12.

Test Area Sale Group 1 - Agricultural Land								
Adjoining Property #	Address	Sale Price	Site Size (AC)	NCCPI Index	Wetlands	Floodplain	Sale Price/AC	Sale Date
Adjoining Property 2	5755 W Southport Rd, Indianapolis, IN	$738,584	89.96	63.4	1%	Zone X	$8,210	Oct-17

Soil Productivity and Land Value Trends and the 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 average level."[1] 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

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production models developed by individual states.[18] 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.[19] 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 inde[redacted]ll later be expanded to include irrigated crops, rangeland, and forestla[redacted]

[redacted]anagement inputs. [redacted]n prov[redacted]tions in crop yields, [redacted]is have developed [redacted]onsiders these factors [redacted]ed land. Except for [redacted]ality or inherent soil p[redacted]place to place for a specific soil (map unit component) identified by the National Cooperative Soil Survey (NCSS)."[21] The NRCS Web Soil Survey website has additional information on how the ratings are determined. The **State of Indiana** does not have its own crop production model and utilizes the NCCPI.

In analyzing agricultural land sales for Control Area Sales with similar characteristics to Adjoining Property 2, we have excluded any parcels with NCCPI soil indices less than 50.0 and greater than 85.0.

We identified and analyzed four Control Area Sales that were comparable in location, size, and use that were not located in close proximity to the solar farm. The Control Area Sales for Adjoining Property 2 are land tracts that were larger than 20 acres and utilized specifically as farmland. We excluded sales that were bank-owned, those between related parties, split transactions, and land with significant improvements.

The Control Area Sales that are included in this analysis 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.

[18] 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.
[19] 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.
[20] AgriData Inc. Docs: http://support.agridatainc.com/NationalCommodityCropProductivityIndex(NCCPI).ashx
[21] USDA NRCS's User Guide National Commodity Crop Productivity Index (NCCPI)

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Dominion Indy III - Group 1: Test Area Sale Map

The Control Area Sales were adjusted for market conditions using a regression and trend analysis to identify the appropriate monthly market condition adjustment. Using the agricultural land sale data published in the *Land Sales Bulletin,*[22] from January 2016 through December 2017, which includes reliable and credible data for analysis, we extracted a monthly rate of change of 0.50 percent.

The results of our analysis for Adjoining Property 2, in Group 1 are presented on the following page.

[22] https://www.landsalesbulletin.com/

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CohnReznick Paired Sale Analysis Dominion Indy III Solar Group 1 - Agricultural Land		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per Acre**
Test Area Sale (Adjoining Property 2)	Yes: Solar Farm was completed by the sale date	$8,210
Control Area Sales (4)	No: Not adjoining solar farm	$8,091
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**1.47%**

Noting the relatively low price differential, in which the Test Area Sale was higher than the median for the Control Areas Sales, it does not appear that the Dominion Indy III solar farm had any negative impact on the adjoining agricultural property value.

Dominion Indy III Solar - Adjoining Properties

We idenitified a total of nine Adjoining Properties that sold after the develoment of the solar farm as single-family home uses. Adjoining Properties 11, 13, 14, 15, 18, 20, 22, 24 and 26 were analyzed in two paired sales analyses (Group 2 and Group 3). These nine properties were analyzed as single-family homes and they are located in the Crossfield subdivision, across West Southport Road from the solar site, as seen in the map above.

It should be noted that Adjoining Properties 11 and 24 have sold more than once since the solar farm was constructed, and each sale is included in the analysis. Adjoining Property 11 sold first in December 2015 and

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later in July 2018, approximately two and a half years later. Adjoining Property 24 sold first in February 2014 and later in April 2019, approximately five years later. Our research indicated that these were arm's-length sales.

The nine Adjoining Properties that were included in our paired sales analysis were divided into two groups, based on the sale dates of the Test Area Sales.

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GROUP 2

For Group 2 (sales in 2014 – 2016), we analyzed four Control Area Sales with similar location, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Group 2 Test Area Sales.

Test Area Sales Group 2									
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
11, 20, 22, 24	5933 Sable Dr, 5829 Sable Dr, 5813 Sable Dr, 5737 Sable Dr	$129,375	0.23	4	2.0	2008	2,163	Jul-15	$60.61

The Test Area Sales in Group 2 are located between 230 feet and 404 feet from the house to the solar panels. The Control Area Sales for Group 2 are located beyond this area in other areas of the Crossfield Division and in other nearby subdivisions.

Dominion Indy III – Group 2: Test Area Sales

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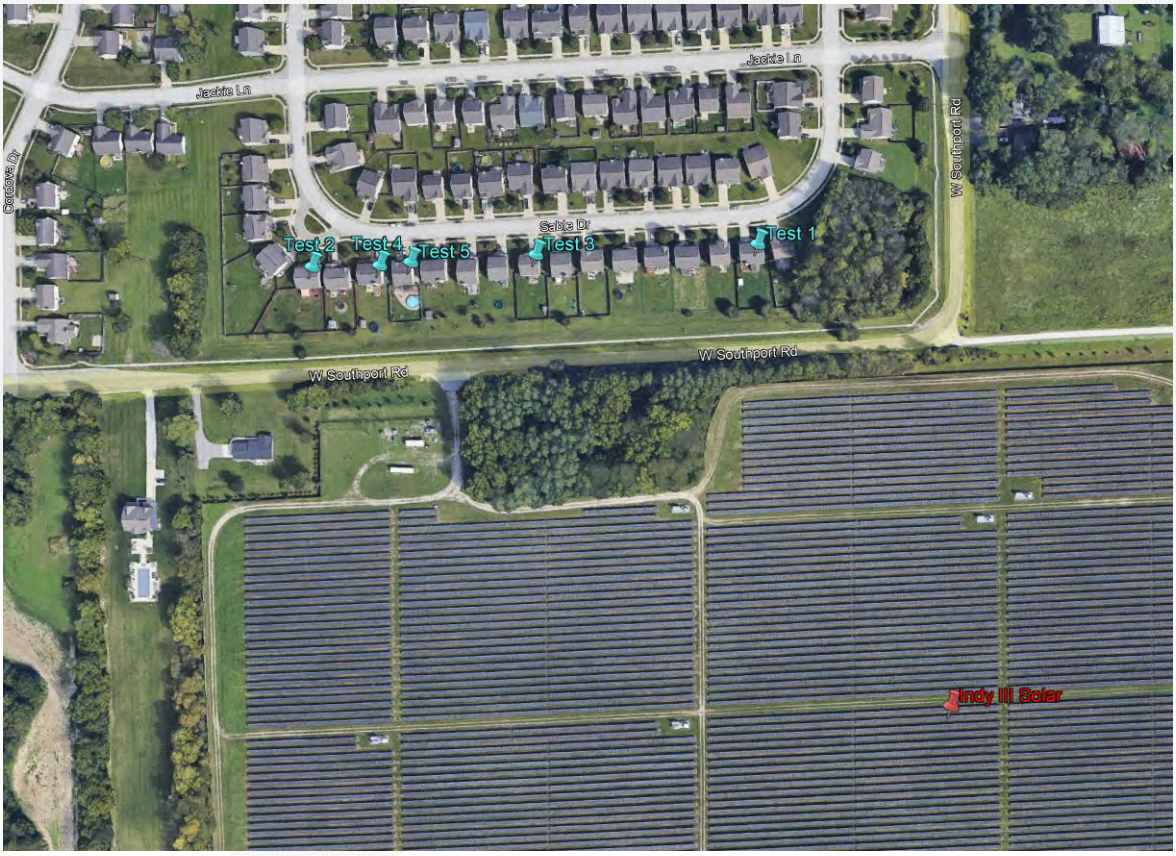
GROUP 3

For Group 3 (sales occurring in 2017 - 2019), we analyzed a set of seven Control Area Sales with similar locations, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Group 3 Test Area Sales.

Dominion Indy III Solar Test Area Sales Group 3									
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
11, 13, 14, 15, 18, 24, 26	5933 Sable Dr, 5921 Sable Dr, 5915 Sable Dr, 5909 Sable Dr, 5841 Sable Dr, 5737 Sable Dr, 5731 Sable Dr	$169,900	0.23	3	2.5	2006	2,412	Jul-18	$72.15

The Test Area Sales in Group 3 are located between 227 feet and 419 feet from the house to the solar panels. The Control Area Sales are located beyond this area, in other areas of the Crossfield Division, and in other nearby subdivisions.



Dominion Indy III – Group 3: Test Area Sales

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Control Area Sales in Groups 2 and 3 were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The results of our study are presented below.

CohnReznick Paired Sale Analysis Dominion Indy III Solar Group 2		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sales (4)	Adjoining solar farm	$60.61
Control Area Sales (8)	No: Not adjoining solar farm	$57.84
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		**4.78%**

CohnReznick Paired Sale Analysis Dominion Indy III Solar Group 3		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sales (7)	Adjoining solar farm	$72.15
Control Area Sales (11)	No: Not adjoining solar farm	$71.69
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		**0.65%**

The Test Area Sales in Group 2 sold between 18 and 75 days on market (0-3 months), while the Control Area Sales in Group 2 sold between 2 and 649 days on market (0-23 months). The Test Area Sales in Group 3 sold between 3 and 75 days on market (0-3 months), while the Control Area Sales in Group 3 sold between 2 and 89 days on market (0-3 months).

Noting the relatively low price differentials, it does not appear that the Dominion Indy III solar farm had any negative impact on adjoining residential property values.

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BEFORE ANNOUNCEMENT AND AFTER CONSTRUCTION OF THE SOLAR FARM ANALYSIS

Due to the number of sales over time in the Crossfield subdivision, we were able to conduct an analysis on the prices of single-family homes before the solar farm announcement date in comparison to the prices of single-family homes after the construction of the Domi[redacted]ws the appreciation rates of homes in the subdivision over the period [redacted]er construction was c[redacted]ifference in the appre[redacted]a (homes adjoining [redacted]), we would expect [redacted] have [redacted]sis below, and the [redacted]

[redacted]ment of the solar farm [redacted]ter Construction of the solar farm period is from December 2013 to 2019.

- 25 Test Area Sales were sold from 2006 to 2019 and 46 Control Area Sales sold from 2008 to 2019.
    - The Test Area Sales are homes located adjoining the Dominion Indy III Solar Farm in the Crossfield subdivision.
    - The Control Area Sales are homes located in the remainder of the Crossfield subdivision, not adjoining the solar farm.
- In both the Test Area Sales (ORANGE) and Control Area Sales (BLUE) plotted on the chart on the following page, new construction homes sold through 2011, prior to announcement of the solar farm.
- The dotted lines are polynomial trend lines plotted by Microsoft Excel in order to illustrate and approximate the "average" trend of each set of data.
- After construction of the solar farm, in parallel with the improving economic climate (as depicted by the Red lines representing the Federal Housing Finance Agency's House Price Index for the East North Central region that includes Indiana), it appears that unit prices for both the Test Area Sales and the Control Area Sales appreciated at a similar rate over the period from 2013 to 2019.
- The economic climate improved in the period from 2013 to 2019, as shown by the Red line representing the Federal Housing Finance Agency's House Price Index for the East North Central region that includes Indiana. After construction of the solar farm, in parallel with the improving economic climate, it appears that unit prices for both the Test Area Sales and the Control Area Sales appreciated at a similar rate over the period from 2013 to 2019.

A difference in appreciation rates does not appear to exist between Test Area Sale homes versus the Control Area Sale homes.

Sale prices of single-family homes after the construction of the solar farm exhibit a similar appreciation trend as sales prior to the solar farm announcement. Overall, our findings indicate that there *is not a consistent and measurable difference* in prices that exists in association with homes proximate to the Dominion Indy III solar farm

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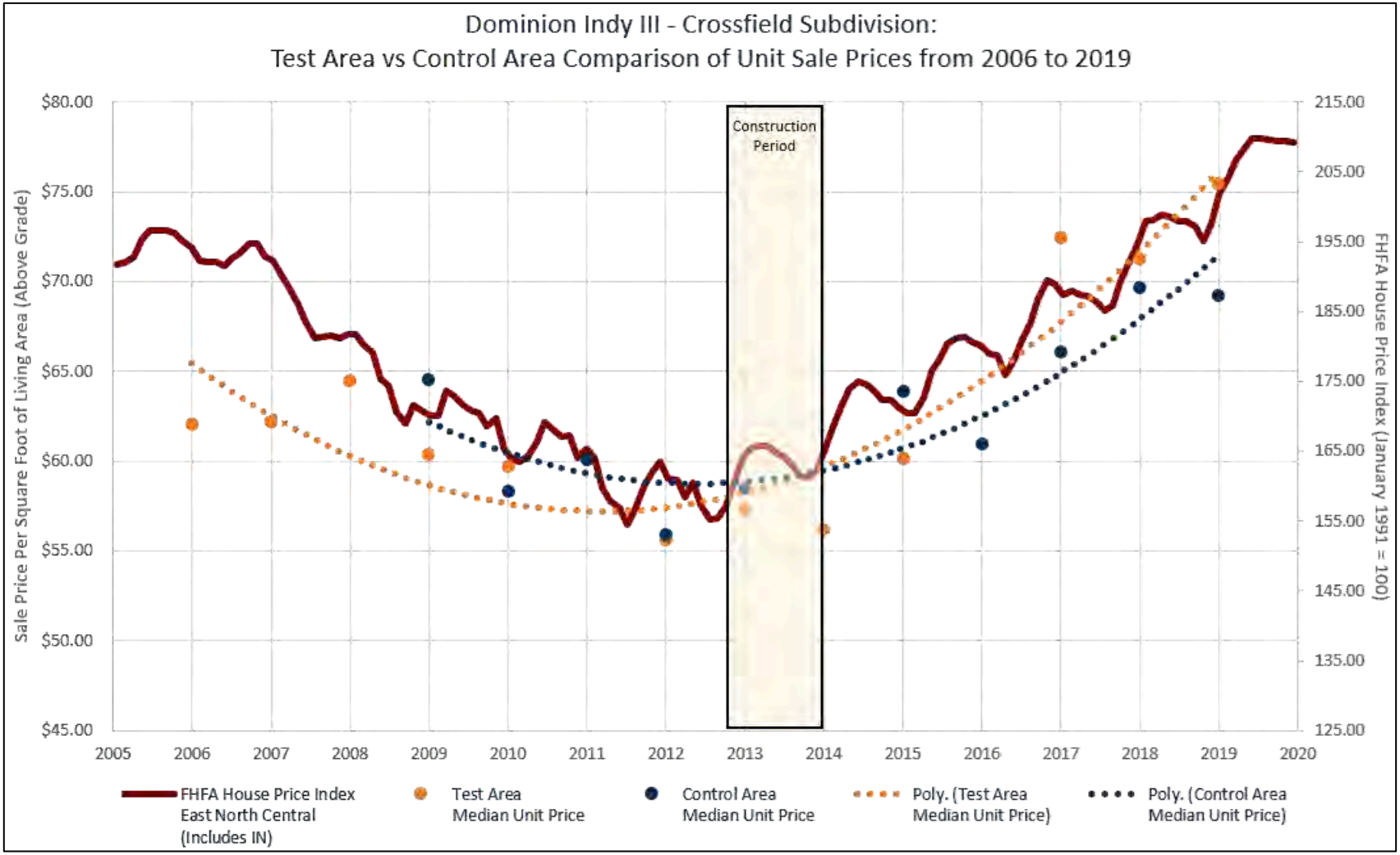
ANALYSIS OF BEFORE ANNOUNCEMENT AND AFTER CONSTRUCTION OF THE DOMINION INDY III SOLAR FAR



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SOLAR FARM 7: O'BRIEN SOLAR FIELDS, DANE COUNTY, WI

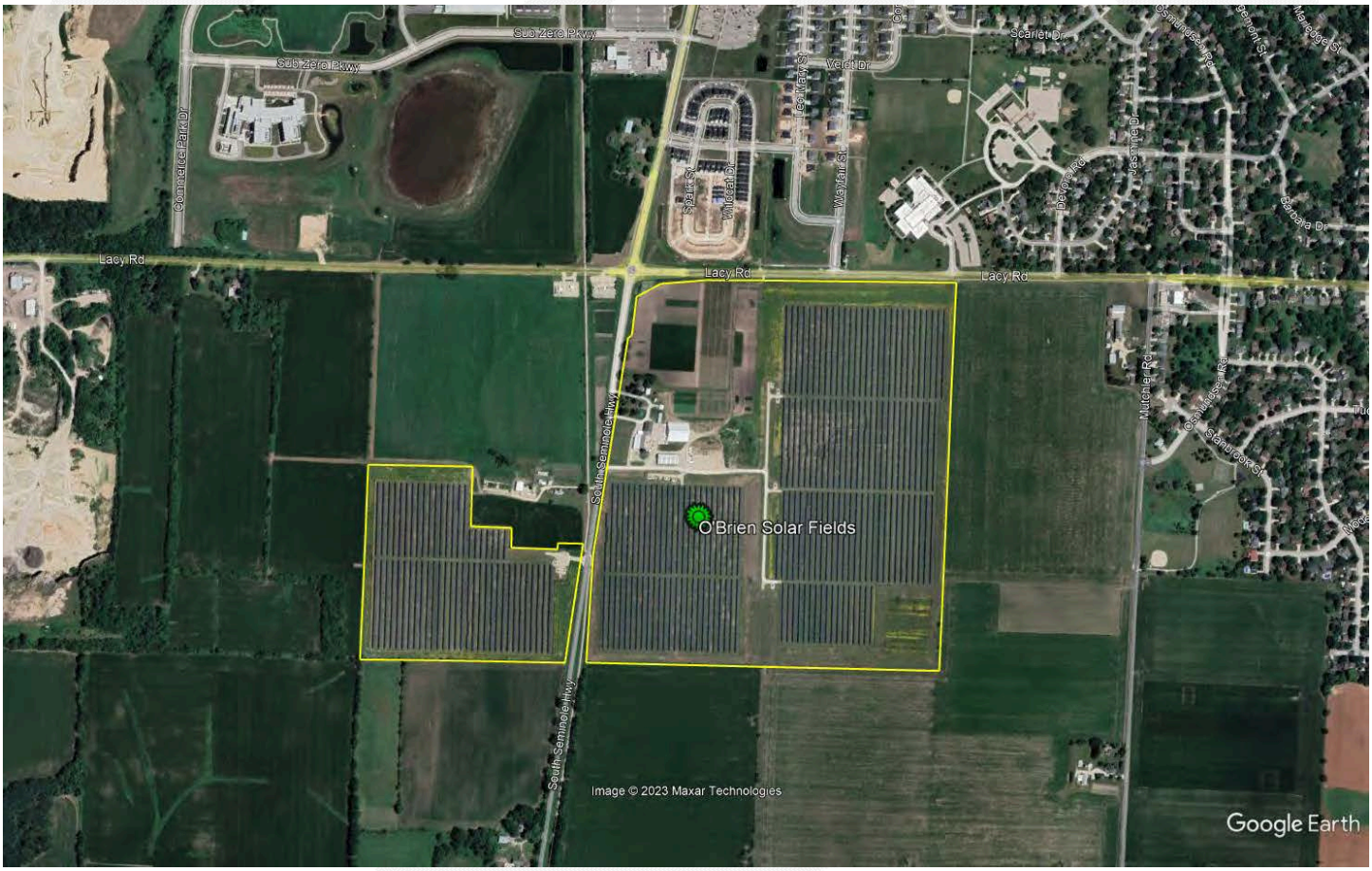
Coordinates: Latitude 42.997665, Longitude -89.45895

PINs: 0609-172-3000-2, 0609-172-1000-2

[redacted]

Date Project Completed: June 2021

Output: 22.1 MW AC



Approximate O'Brien Solar Fields boundaries outlined in yellow, aerial imagery provided by Google Earth dated July 2022

The O'Brien Solar Fields project is located in Dane County, Wisconsin and is in between Lacy Road to the north, Whalen Road to the south, and bisected by South Seminole Highway.

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The current owner of the solar farm is Madison Gas & Electric Company (MGE) while EDF Renewables developed the solar facility. The electricity generated from the project is being offered by MGE to local businesses, under MGE's Renewable Energy Rider program, to power all or a portion of their businesses. The Renewable Energy Rider program allows MGE to provide all or a significant portion of electricity from renewable generation to businesses interested in utilizing re[redacted] a minimum electric demand level of 200 kW. The solar farm went in[redacted]ed of nearly 60,000 p[redacted]

[redacted]ar Fiel[redacted]County, Wisconsin, [redacted] Wisconsin. Dane [redacted]ulous county in Wisc[redacted]Capital, the City of [redacted]roximately 75 miles w[redacted]orthwest of the City of Chicago, Illinois and 125 miles southwest of the City of Green Bay.

The O'Brien Solar Fields project is one of the 46 solar farms in Wisconsin and is one of seven solar farms located within Dane County, Wisconsin. The O'Brien Solar Fields project is the seventh largest solar farm in Wisconsin, and the largest within Dane County, with the largest solar farms in the state being Badger Hollow I Solar farm in Iowa County and Two Creeks Solar Farm Manitowoc County, which both produce an output of 150 MW.

The Immediate Area: The solar farm spans over 170 acres in Dane County and is immediately surrounded by primarily agricultural land with residential properties to the north and a middle school to the northeast. Further to the northeast lies more densely concentrated residential, commercial properties, and the University of Wisconsin-Madison, in the City of Madison, approximately five miles from the Project site.

Real Estate Tax Info: In Dane County, Wisconsin, real property is assessed on annual basis as of January 1 each year. The Notice of Assessment is typically sent out to property owners in March of each year and Tax Bills are send the third Monday of December each year. Property tax bills are then due the following January 31st and July 31st for the preceding tax year.

The two participating parcels that make up the O'Brien Solar Fields site were formerly split into six parcels, "parent parcels", that have since been combined as of the 2023 tax year. The data presented below is from the six "parent parcels" from the 2020 and 2021 tax years.

Pin	Acres	2020 Taxes Paid	2021 Taxes Paid	Tax Increase	2020 Assessed Value	2021 Assessed Value	Value Increase
Dane County, WI							
0609-172-3000-2	35.061						
0609-172-9000-5		$5,109	$9,153	79.15%	$231,400	$402,300	73.85%
0609-172-9610-7		-	-	-	-	-	-
0609-172-1000-2	136.056						
0609-171-8500-3		$265	$0	-100.00%	$11,800	$0	-100.00%
0609-171-9000-6		$272	$0	-100.00%	$12,100	$0	-100.00%
0609-172-8000-7		$15,045	$15,449	2.69%	$663,300	$663,300	0.00%
0609-172-9500-0		$216	$0	-100.00%	$9,600	$0	-100.00%
Total	171.117	$20,907	$24,602	17.67%	$928,200	$1,065,600	14.80%

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In the State of Wisconsin, solar arrays with above 50 MW of generation capacity are exempt from local property taxes. Instead, solar farms pay a license fee to the State who then distributes payments to the county and township, city, or village in which the solar farm is located to compensate the local governments. Under current law, the local government receive a combined $5,000 per MW of solar capacity annually from the State once the project reaches commercial operation. A formula [redacted] tween counties and towns, villages or cities is presented below.

Local Jurisdiction	Jurisdiction	Percentage	Amount Paid Annually per MW
System is located in a city or village	City/Village	56.70%	$2,833
	County	43.30%	$2,167
System is located in a town	Town	43.30%	$2,167
	County	56.70%	$2,833

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 July 2022.

O'Brien Solar Fields – Adjoining Properties

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O'Brien Solar Fields – Adjoining Properties

PAIRED SALES ANALYSIS

In reviewing Adjoining Properties to study in a Paired Sales Analysis, one sale of the four identified was considered but eliminated from further consideration as discussed below.

Adjoining Property 7 is comprised of 40-acres of land formerly used as an agriculture land use that sold to Emerson College in Septmeber 2022 for $734,000. Emerson College has plans to develop an athletic complex on the land that is adjacent to the O'Brien Solar Fields. As the land was purchased by Emerson College, the zoning changed from Agricultural to exempt, per the Dane County Zoning Office. As the property is not subject to zoning after being a former agricultural use, we have not included the sale of Adjoining Property 7 in our analysis due to the unique nature of the property's allowable uses and lack of comparable land sales that are exempt to zoning in the surrounding area.

Group 1 – Improved Single-Family Residential Properties

Adjoining Property 23 to the O'Brien Solar Fields Project was considered for a paired sales anaylsis, and we have anaylzed this property as a single-family home use in Group 1. The property is a two-story, freestanding, 1,605 sqaure foot home with a full unfinished basement and attached garage, located on a 0.10-acre lot that sold in April 2023. The property is located within the Crescent Crossing subdivision, a new development consisting of 117 single-family homes with original home plans. Crescent Crossing is made up of both attached duplexes and freestanding single-family homes. This property line is approximately 495 feet from the closest

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solar panel, and the improvements are approximately 530 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 23.

SUMMARY OF TEST AREA SALE Group 1 - O'Brien Solar Fields										
Adj .Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
23	2473 Wildcat Drive, Fitchburg	$419,900	3	2.5	2023	1,605	2-Story SFH with Unfinished Basement and Attached Garage	0.10	$261.62	Apr-23

[redacted] that were located [redacted] ubdivision, that sold w[redacted]ale date of the Test Area Sale in Group 1. The Control Area Sales for Group 1 are freestanding single-family homes located on lots less than 0.5-acres in size with three bedrooms and two and a half baths, consisting of between 1,516 square feet and 1,632 square feet of gross living area, and built between 2021 and 2023. The Control Area Sales also have attached garage parking and unfinished 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 O'Brien Solar Fields – Group 1 is presented below.

CohnReznick Paired Sale Analysis O'Brien Solar Fields - Group 1		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sale (1)	Adjoining solar farm	$261.62
Control Area Sales (45)	No: Not adjoining solar farm	$268.41
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**-2.53%**

Noting no negative marketing time differential, Adjoining Property 23 sold in 55 days, while the Control Area Sales sold between 42 and 163 days, with a median time on market of 82 days. Additionally, Adjoining Property 23 sold for its' listing price while the Control Area Sales sold for between 2.56 percent below to 2.63 percent above their listing price.

Noting minimal negative price differential, with Test Area Sale 1 having a slightly lower unit sale price than the Control Area Sales, it does not appear that the O'Brien Solar Fields had any negative impact on the sale of the Test Area Sale.

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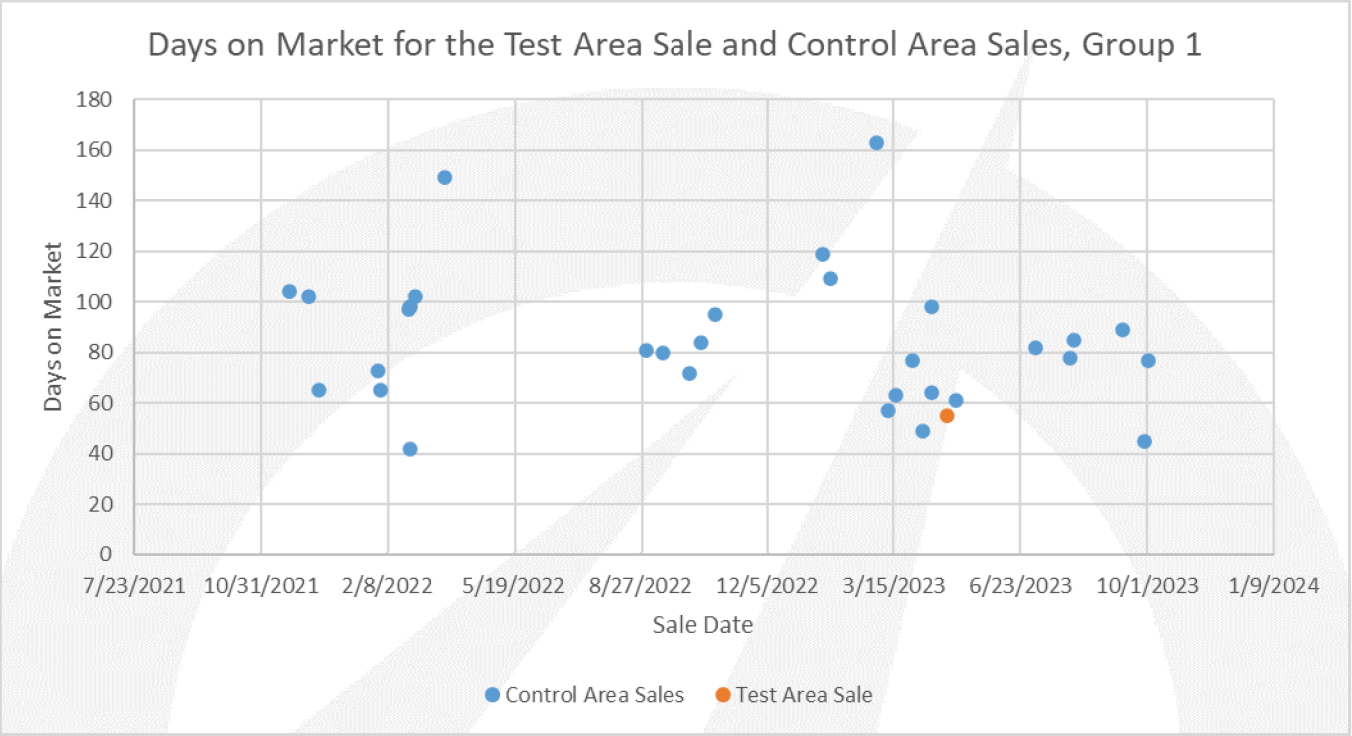

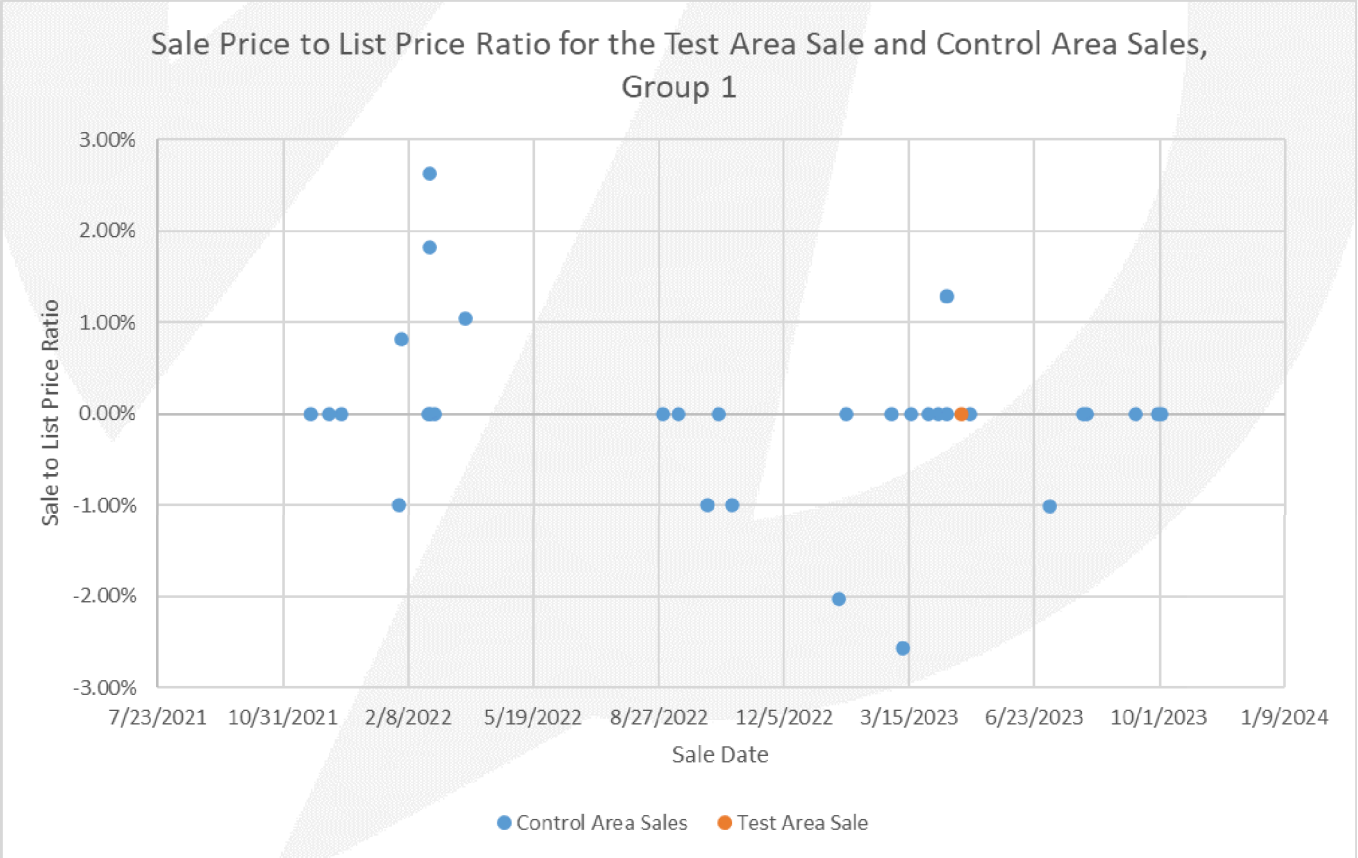

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Crescent Crossing Subdivision Map, Test Area Sale 1, Adjoining Property 23 (Lot 19) is outlined in yellow above; O'Brien Solar Fields is located adjacent to the southeast as indicated by the red arrow above.

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Group 2 – Improved Single-Family Residential Properties

Adjoining Property 25 to the O'Brien Solar Fields 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 freestanding, two-story 2,946 square foot home with an attached garage [redacted] 25-acre lot and sold in March 2023. The proprety is located within the [redacted] oment consisting of 1[redacted] he Stoner Prairie sub[redacted] s and features, that [redacted] uick move-ins. The [redacted] appro[redacted] l while the property [redacted] e other important [redacted] operty 25.

SUMMARY OF TEST AREA SALE Group 2 - O'Brien Solar Fields										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
25	2713 Leo Mary Street	$737,200	3	2.5	2023	2,946	2-Story SFH with Attached Garage and Unfinished Basement	0.25	$250.24	Mar-23

We analyzed 22 Control Area Sales of single-family homes with similar construction and use that were located within the Stoner Prairie subdivision, that sold within a reasonable time frame from the sale dates of the Test Area Sales in Group 2. The Control Area Sales for Group 2 are single-family homes located on lots less than 0.5-acres in size with three to four bedrooms and two and a half to three baths, consisting of between 2,483 square feet and 3,250 square feet of gross living area, and built between 2021 and 2023. The Control Area Sales also have additional improvements such as attached garage parking and unfinished 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 O'Brien Solar Fields Project – Group 2 is presented below.

CohnReznick Paired Sale Analysis O'Brien Solar Fields - Group 2		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sale (1)	Adjoining solar farm	$250.24
Control Area Sales (22)	No: Not adjoining solar farm	$247.38
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**1.16%**

Noting no negative price differential, it does not appear that the O'Brien Solar Fields use impacted the sale of the Test Area Sale, Adjoining Property 25.

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The homes within the Stoner Prairie subdivision are primarily sold directly to the homebuyer, who can select a base floor plan and make slight modifications to their liking. As such, a majority of the control area home sales were not openly marketed, which is also the case for Adjoining Property 25.

Group 3 – Improved Single-Family Residential Properties

Adjoining Property 27 to the O'Brien Solar Fields [redacted] s analysis, and we h[redacted] y as single family hor[redacted] standing, two-story [redacted] 24-acre lot and sold [redacted] within th[redacted] oment consisting of [redacted] and features, that [redacted] rences, allowing hom[redacted] ck move-ins. The improvements on this property are located approximately 470 feet to the nearest solar panel while the property line is approximately 420 feet to the nearest solar panel. The following table outlines the other important characteristics of Adjoining Property 27.

SUMMARY OF TEST AREA SALE Group 3 - O'Brien Solar Fields										
Adj. Property #	Address	Sale Price	Beds	Baths	Year Built	Home Size (SF)	Improvements	Site Size (AC)	Sale Price / SF	Sale Date
27	2705 Leo Mary Street	$765,774	5	4.5	2023	3,698	2-Story SFH with Attached Garage and Unfinished Basement	0.24	$207.08	May-23

We analyzed 4 Control Area Sales of single-family homes with similar construction and use that were located within the Stoner Prairie subdivision, that sold within a reasonable time frame from the sale dates of the Test Area Sales in Group 3. The Control Area Sales for Group 3 are single-family homes located on lots less than 0.5-acres in size with four to five bedrooms and two and a half to three and a half baths, consisting of between 3,206 square feet and 3,925 square feet of gross living area, and built between 2021 and 2022. The Control Area Sales also have additional improvements such as attached garage parking, unfinished basements and partially finished 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 O'Brien Solar Fields Project – Group 3 is presented below.

CohnReznick Paired Sale Analysis O'Brien Solar Fields - Group 3		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sale (1)	Adjoining solar farm	$207.08
Control Area Sales (4)	No: Not adjoining solar farm	$206.42
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**0.32%**

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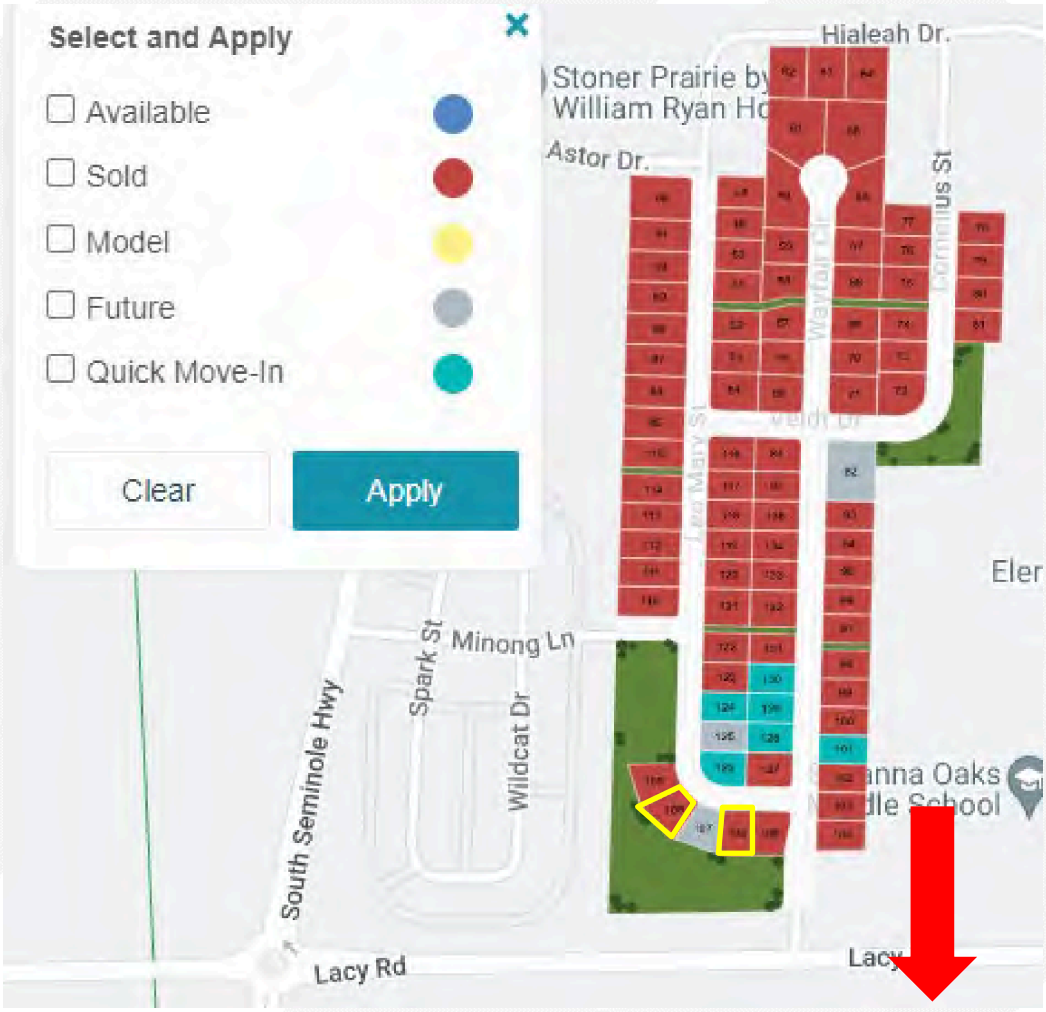
Noting no negative price differential, it does not appear that the O'Brien Solar Fields use impacted the sale of the Test Area Sale, Adjoining Property 27.

The homes within the Stoner Prairie subdivision are primarily sold directly to the homebuyer, who can select a base floor plan and make slight modifications to their liking. As such, a majority of the control area home sales were not openly marketed, which is also the case for Adjoining Property 27.



Stoner Prairie Subdivision Map, Test Area Sales 2 & 3, Adjoining Properties 25 & 27 are outlined in yellow above; O'Brien Solar Fields is located adjacent to the south as indicated by the red arrow above.

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SOLAR FARM 8: PORTAGE SOLAR FARM, PORTAGE, PORTER COUNTY, INDIANA

Coordinates: Latitude 41.333263, Longitude -87.093015

PIN: 64-06-19-176-001.000-015

Total Land Size: 56 AC

[redacted]

The solar farm was developed by Ecos Energy, a subsidiary of Allco Renewable Energy Limited, and is currently owned by PLH, Inc. This solar panels are ground-mounted the facility has the capacity for 1.96 Megawatts (MW) AC of power, which is enough to power 300 homes. This solar farm consists of 7,128 solar modules which are of a fixed tilt installation and it contains three inverters.

The Surrounding Area: The Portage Solar Farm is located outside the City of Portage, in Portage Township, approximately 2.5 miles to the southeast of the city center. The solar farm is also approximately two miles northwest of South Haven, a neighboring residential community. Portage Township is in the northern portion of Porter County, which is in the northwestern corner of the state of Indiana. The solar farm is approximately 45 miles southeast of downtown Chicago.

The Immediate Area: This solar farm is located on the south side of Robbins Road, and is surrounded to the west, south, and east by agricultural land. Just beyond the agricultural land buffer, uses to the west and east area single family homes, and to the south is an apartment complex and a commercial development with an IMAX movie theater and restaurants. To the north of the solar farm, across Robbins Road uses consist of a residential subdivision and vacant land. The solar farm and surrounding properties have a Valparaiso mailing address.

The solar farm is fenced from adjacent properties by a fence that surrounds all of the solar panels. Natural vegetation borders the northern, and eastern sides of the larger agricultural parcel the solar farm is nestled within.

Real Estate Tax Information: The taxes on the 56 acres of farmland were $1,400 per year prior to the solar farm development. After the solar farm was developed, only 13 acres (23 percent of the site) were re-assessed and the remaining 43 acres continued to be farmed. The total real estate tax bill increased to $16,350 after the solar farm was built, including both uses on the site. This indicates that the real estate taxes for the solar farm increased from $25 per acre to $1,175 per acre after the solar farm was developed.

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The map below displays the solar farm parcel shaded in blue, and the adjoining properties (outlined in red). Adjoining Properties to the solar farm are numbered for subsequent analysis.

Portage Solar Farm - Adjoining Properties

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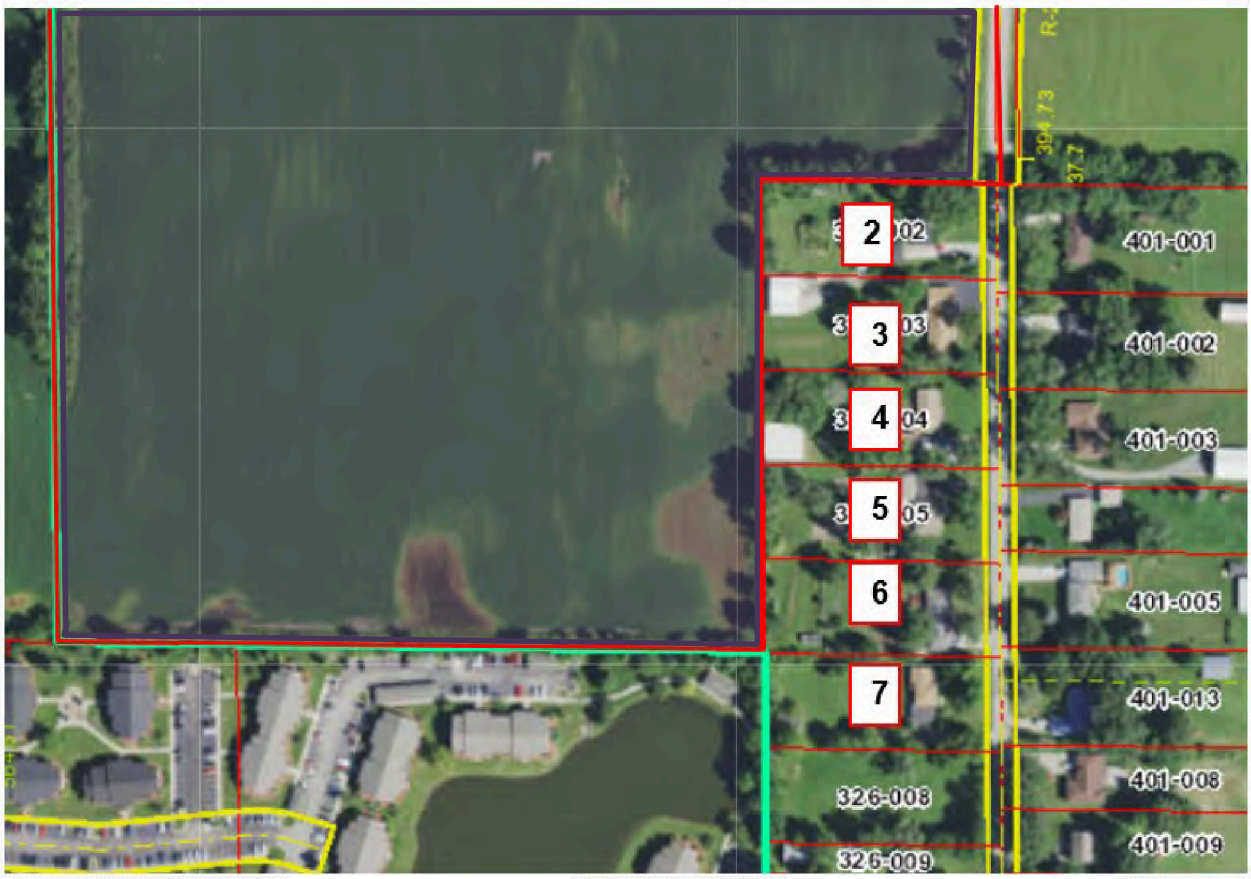

Portage Solar Farm - Adjoining Properties

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PAIRED SALES ANALYSIS

Adjoining Properties 1 and 7 (Test Area Sales) were each considered for a paired sales analysis. Adjoining Property 1 was analyzed as homestead-small farmland tract since at the time of purchase the site was used only as agricultural land. The buyer bought it as vaca[redacted] the site. Adjoining Property 7 was analyzed as a single-family home[redacted]

GROUP 1

[redacted]est solar panel and [redacted] eventually built is a[redacted]t solar panel. The [redacted]er important characte[redacted]

Portage Solar Test Area Sale Group 1								
Adj. Property #	Address	Sale Price	Site Size (AC)	PI Index (Corn)	Year Built	Vacant at the Time of Sale	Sale Price per Acre	Sale Date
1	442 W 875 N, Valparaiso	$149,600	18.70	139.30	2017 (After Purchase)	Yes	$8,000	Feb-14

In Group 1, we analyzed nine Control Area Sales of homesteads-small farmland tracts that sold within a reasonable time frame from the sale date of Adjoining Property 1. All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.

The result of our analysis for Group 1 is presented below.

CohnReznick Paired Sale Analysis Portage Solar Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per Acre
Test Area Sales (1)	Adjoining solar farm	$8,000
Control Area Sales (9)	No: Not adjoining solar farm	$7,674
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**4.25%**

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GROUP 2

For Adjoining Property 7 (Group 2), the residential home is approximately 1,227 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 7.

Portage Solar Test Area Sale Group 2									
Adj. Property #	Address	Sale Price	Site Size (AC)	Beds	Baths	Year Built	Square Feet	Sale Price per SF	Sale Date
7	836 N 450 W Valparaiso	$149,800	1.00	3.0	1.5	1964	1,776	$84.35	Sep-13

For Adjoining Property 7, we analyzed seven Control Area Sales of similar single family homes that sold within a reasonable time frame from the sale date of Adjoining Property 7. All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.

Portage Solar - Group 2: Test Area Sale Map

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The result of our analysis for Group 2 is presented below.

CohnReznick Paired Sale Analysis Portage Solar Group 2		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sales (1)	Adjoining solar farm	$84.35
Control Area Sales (7)	No: Not adjoining solar farm	$84.27
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**0.10%**

Noting the relatively small price differentials between Test Area Sales and Control Area Sales, with both Test Area Sales (Adjoining Property 1 and 7) having higher unit sale prices than the respective Control Area Sales, it does not appear that the Portage Solar Farm had any negative impact on adjacent property values.

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SOLAR FARM 9: IMPA FRANKTON SOLAR FARM, FRANKTON, INDIANA

Location: Frankton, Madison County, Indiana

Coordinates: Latitude 40.125701; Longitude -85.4626 88

PIN: 48-08-06-500-012.001-020

[redacted]

e 2014

Output: 1.0 MW AC (1.426 MW DC)

IMPA Frankton Solar Farm is located on the west side of South Lafayette Street, in the Town of Frankton. The solar farm was built in 2014 in joint effort by Inovateus Solar and Indiana Municipal Power Agency (IMPA). This solar farm has the capacity for 1 MW AC and its expected annual output is 1,426 MWh (megawatt hours). The solar farm is separated off from the adjacent properties by a 6 foot fence that surrounds the entirety of the solar panels. From our inspection of the site, we noted that the driveway to access the panels slopes downward and allows some views of the site.

The Surrounding Area: The IMPA Frankton solar farm is located in Lafayette Township, in the central portion of Madison County, Indiana. The solar farm is approximately 50 miles northeast of the center of Indianapolis and 65 miles northeast of the Indianapolis International Airport.

The Immediate Area: The solar installation is relatively centrally located in an undeveloped pocket of the town of Frankton, on the western side of South Lafayette Street. Adjoining parcels to the west include park land featuring baseball fields. Land further to the west is agricultural in nature, actively farmed primarily with row crops. Adjoining parcels to the north are residential with large estate homes. Adjoining the solar farm to the southeast is a single-family home identified in our analysis as Adjoining Property 7, and a baseball field. More farmland is directly south of the solar site. The solar site is adjoining a number of homes located east of the panels, along Lafayette Street. Mature trees at the rear of residential properties act as vegetative buffers.

Across Lafayette Street, to the east, are single-family residential homes forming the southeast quadrant of homes in Frankton.

All of the adjacent land parcels to the solar farm are used for agricultural, residential, or recreational purposes.

The solar farm is surrounded by a chain link fence that contains all the solar panels. Additionally, vegetative buffers along sides facing residential properties were planted as part of the solar farm development.

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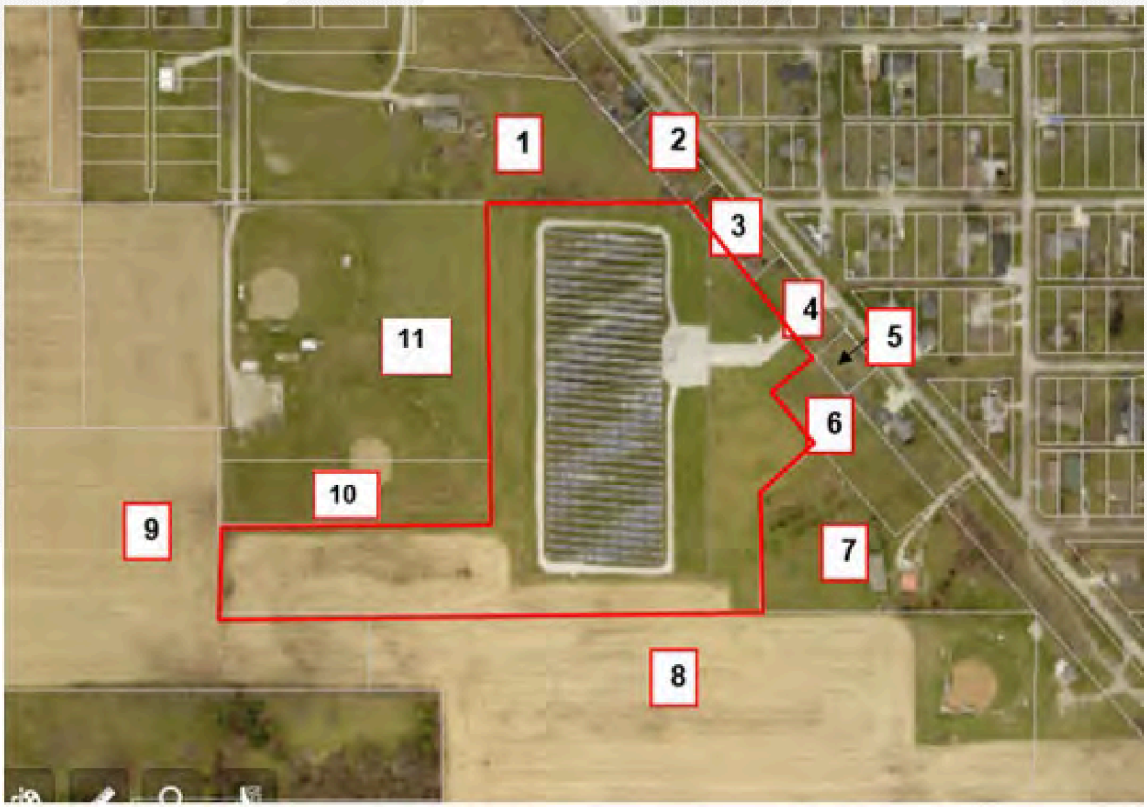
Real Estate Tax Information: Prior to development of the solar farm in 2014, the original owner held one parcel of 15.667 acres with a home, pole barn and a utility shed, and no personal property was assessed on this parcel. In 2014 the parcel was split into two parcels and 13 acres was sold to IMPA for development of the solar farm. The owner of the parent parcel of 15.667 acres paid real estate taxes of $1,799 annually, prior to the split. After development of the solar farm, real estate taxes for both parcels, plus personal property tax revenue generated from the solar parcel, caused an increase $8,275, or a 360 percent increase in tax revenue for the entire site.

PIN	Acres	2013 Taxes Paid	2017 Taxes Paid	Tax Increase	2013 Assessed Value	2017 Assessed Value	Value Increase
Madison County, IN							
48-08-06-500-012.000-020 (parent)	15.667 (2013)	$ 1,799	$ 1,402		$ 138,700	$ 127,000	
Personal Property		$ -	$ -		$ -	$ -	
48-08-06-500-012.001-020 (2014 solar parcel split)	13.00 (2017)	$ -	$ 4,063		$ -	$ 137,400	
Personal Property		$ -	$ 2,810		$ -	$ 440,380	
TOTAL	**0.00**	**$ 1,799**	**$ 8,275**	**360%**	**$ 138,700**	**$ 704,780**	**408%**

The map below displays the solar farm parcel (outlined in red). Properties adjoining this parcel are numbered for subsequent analysis.



IMPA Frankton Solar Farm - Adjoining Properties

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PAIRED SALES ANALYSIS

We have performed a paired sales analysis with regards to the IMPA Frankton solar farm. The analysis compares sales of Adjoining Properties to the solar farm after the completion of the solar farm site (Test Area Sales) to similar properties not proximate to the solar far[redacted]type of paired sale analysis for both groups of Adjoining Properties u[redacted]

GROUP 1

[redacted] Test Area Sale in [redacted]re not located in clos[redacted]ed sales that were [redacted] arms'-length transac[redacted]tured single-family home use.

IMPA Frankton Solar Farm Test Area Sales Group 1									
Adj. Property #	Address	Sale Price	Site Size (AC)	Beds	Baths	Year Built	Home Size (SF)	Sale Date	Price PSF
2	607 S. Lafayette St Frankton, IN	$41,900	0.37	2	2	1991	1,466	Jun-15	$28.58

We identified six Control Area Sales that are included in this analysis that sold within a reasonable time frame from the sale date of the Test Area Sale (Adjoining Property 2) and are similar to the Test Area Sale in physical characteristics.

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IMPA Frankton Solar Farm – Group 1: Test Area Sale Map

Control Area Sales in Group 1 were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The results of our study are presented below.

CohnReznick Paired Sale Analysis IMPA Frankton Solar Farm Group 1		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price per SF**
Test Area Sale (1)	Adjoining Solar Farm	$28.58
Control Area Sales (6)	No: Not adjoining solar farm	$28.42
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		**0.56%**

GROUP 2

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In Group 2, we identified and analyzed five Control Area Sales that were comparable to the Test Area Sale (Adjoining Property 7) in location, size, and use that were not located in close proximity to the solar farm. We excluded sales that were bank-owned, or otherwise non arms'-length transactions. Adjoining Property 7 was analyzed as a single-family home use.

IMPA Frankton Solar Farm Test Area Sales Group 2									
Adj. Property #	Address	Sale Price	Site Size (AC)	Beds	Baths	Year Built	Home Size (SF)	Sale Date	Price PSF
7	713 S. Lafeyette St Frankton, IN	$131,000	3.04	4	2	2003	2,500	Oct-16	$52.40

We identified five Control Area Sales that are included in this analysis that 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.

IMPA Frankton Solar Farm – Group 2: Test Area Sale Map

Control Area Sales in Group 2 were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The results of our study are presented below.

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CohnReznick Paired Sale Analysis IMPA Frankton Solar Farm Group 2		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price per SF**
[redacted]ea Sale (1)	[redacted]	[redacted]
[redacted]	[redacted] No:	[redacted]
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		**1.81%**

Noting the relatively small price differential, in which the Test Area Sales were higher than the median for the Control Areas Sales, in both Groups 1 and 2, it does not appear that the IMPA Frankton solar farm had any negative impact on adjoining property values.

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SOLAR FARM 10: VALPARAISO SOLAR, VALPARAISO, PORTER COUNTY, INDIANA

Coordinates: Latitude 41.301180, Longitude –87.094055

PINs: 64-09-07-152-001.000-019 and 64-09-07-152-002.000-019

Total Land Size: 27.9 Acres

[redacted]

The Valparaiso solar farm was developed by Sustainable Power Group, LLC and became operational in December 2012. The solar facility has ground mounted capacity for 1.0 Megawatts (MW) AC of power. The panels are mounted in a fixed tilt fashion and there are two inverters in this solar farm.

The Surrounding Area: The Valparaiso solar farm is located in Union Township, in the northwest portion of Porter County, Indiana. Porter County is located in the very northwest corner of the state of Indiana. The solar farm is approximately 10 miles northwest of the Porter County Regional Airport and approximately six and a half miles northwest of the center of the city of Valparaiso.

The Immediate Area: This solar farm is located on the southern side of Indiana Route 130 (Railroad Avenue) in Valparaiso, Porter County, Indiana and is located approximately 35 miles southwest of downtown Chicago.

Adjoining parcels to the solar farm to the east and south are residential homes and to the west and north are agricultural in nature.

The solar farm is lined by a chain link fence that surrounds all of the solar panels. Additionally, there are bushes and trees to the north and west of the solar panels; this vegetation has been in place since before development of the solar farm. Other small trees were planted and spaced out around the perimeter of the solar farm after development. From our inspection, the solar panels cannot be seen from Indiana State Route 130 from the north, nor on N 475 W Road to the east as this is a raised roadway. The adjacent properties to the east of the solar panels have full view of the panels from the backyards of the homes.

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Real Estate Tax Information: Prior to development of the solar farm, in 2011, the original parent parcel contained a home, a homesite, excess land, and agricultural land. In 2012, Valparaiso Solar, LLC bought the entire property to develop the solar farm on. Subsequently when Valparaiso Solar, LLC sold the project to PLH, LLC, they split the parcels so that the home and homesite were one parcel of 3.25 acres and the remaining 24.65 acres were the solar panel site. After development of the solar farm development, in 2015, total real estate taxes for both parcels had increased to approximately $2,587, a 25 percent increase in tax revenue for the site.

PIN	Acres	2011 Taxes Paid	2015 Taxes Paid	Tax Increase	2011 Assessed Value	2015 Assessed Value	Value Increase
Porter County, IN							
64-09-07-151-001.000-019 (parent parcel)		$ 2,072			$ 203,800		
64-09-07-152-001.000-019 (split parcel)	24.65		$ 2,587			$ 156,800	
64-09-07-152-002.000-019 (split parcel)	3.25		$ 1,741			$ 187,900	
TOTAL	**27.90**	**$ 2,072**	**$ 2,587**	**25%**	**$ 203,800**	**$ 344,700**	**69%**

The maps below and on the following page display the solar farm parcels (outlined in red). Properties adjoining this parcel are numbered for subsequent analysis.

Valparaiso Solar Farm - Adjoining Properties

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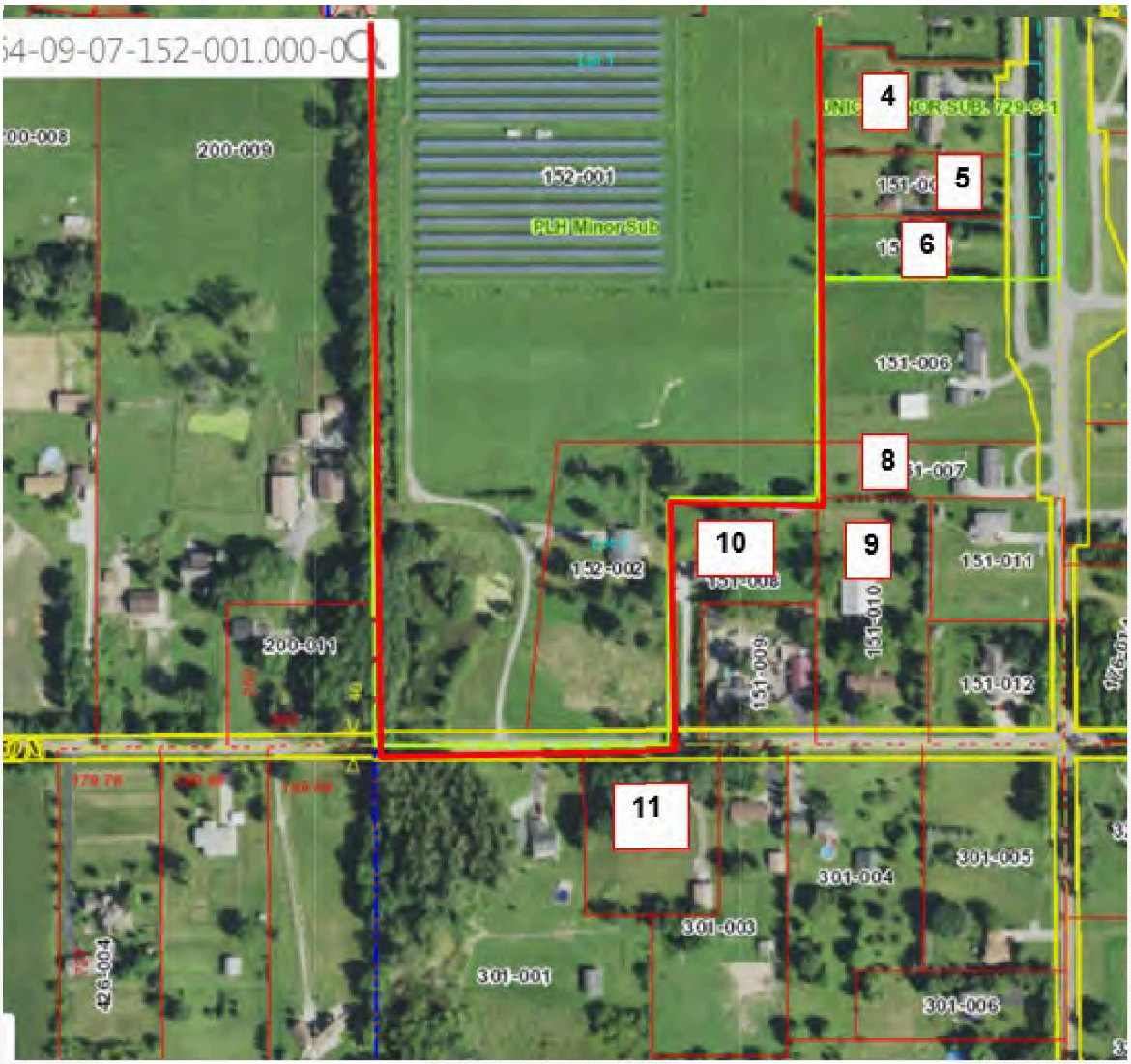

Valparaiso Solar Farm - Adjoining Properties

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PAIRED SALES ANALYSIS

Adjoining Properties 10 and 14 (Test Area Sales) were each considered for a paired sales analysis. Both were analyzed as single-family home uses.

GROUP 1

[redacted] closest solar panel.

Valparaiso Solar Test Area Sale Group 1									
Adj. Property #	Address	Sale Price	Site Size (AC)	Beds	Baths	Year Built	Square Feet	Price PSF	Sale Date
10	489 W 450 N, Valparaiso, IN	$105,000	1.45	3	2	1993	1,274	$ 82.42	Jul-15

We analyzed five Control Area Sales that sold within a reasonable time frame from the sale date of Adjoining Property 10. All Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment.

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Valparaiso Solar - Group 1: Test Area Sale Map

The result of our analyses for Group 1 is presented below.

CohnReznick Paired Sale Analysis Valparaiso Solar Group 1		
No. of Sales	**Potentially Impacted by Solar Farm**	**Adjusted Median Price Per SF**
Test Area Sales (1)	Adjoining solar farm	$82.42
Control Area Sales (5)	No: Not adjoining solar farm	$79.95
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		**3.09%**

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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.

[redacted] Delta Township has the [redacted] was completed in [redacted] *ar facility and stated* [redacted] *value.* Mr. Droeste [redacted] ls.

[redacted] perty Valuation Admin [redacted] een no complaints [redacted] er Cooperative, Inc.'s [redacted] 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 deterrant 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.*

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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*

[redacted] stated that most of [redacted] *on property values.* [redacted] assessed value.

[redacted] stated that he *has* [redacted] *lues of properties nea* [redacted]

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 Thompkins 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 form 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.*

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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 Va[redacted]ana Assessor. She [redacted] sites and stated that [redacted]*es from proximity to* [redacted] [redacted]ar farms have only [redacted]*due to proximity to* [redacted]

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.*[23]

[23] Chisago County Press: County Board Real Estate Update Shows No "Solar Effects" (11/03/2017)

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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 [redacted] on research and C[redacted]olar farm site visits a[redacted]y harmonious with s[redacted] zo[redacted]

[redacted] sidence can range [redacted]15[redacted] velopers generally [redacted]nce and often leave ex[redacted] 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 (CO_2) 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.[24] 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,

[24] Virginia Solar Initiative - Weldon Cooper Center for Public Service – University of Virginia (https://solar.coopercenter.org/taxonomy/term/5311)

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thus minimizing competition between energy production and food.[25] 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 visit[redacted]wer season to track the number and type of insects attracted to the[redacted]ars of tracking, the p[redacted]ncreased more than 2[redacted]ienced an increase [redacted]gy can be a feasible [redacted]ations like can imp[redacted]icultural fields.[26]

[redacted]ning to solar farms are[redacted]

[25] (Bryce, Anthropocene Magazine, 2023) (Solar panels handle heat better when combined with crops (anthropocenemagazine.org))

[26] (Cornwall, Solar Farms Could Come with a Pollinator Bonus, 2024) (Solar farms could come with a pollinator bonus (anthropocenemagazine.org))

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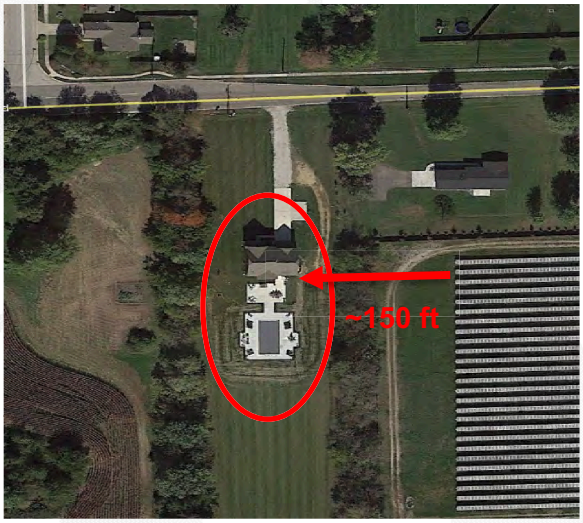
For the Dominion Indy III solar farm, the adjacent land to the west was acquired and subsequently developed with a large estate home – after the solar panels had been in operation for years.

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)

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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

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Developer Built Home
Sold 6/18/19 for $265,900 ($110.75/sf)
Cumberland County, NC (adjacent to Innovative 42 solar farm)

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Portage Solar Farm located in Indiana

A new 175-home subdivision is currently under construction adjacent 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 March 2024, there have been 64 closed sales, ranging from $274,900 to $454,675, or $105.00 to $220.54 PSF, with a median of $374,990, with a median of $167.01 PSF. There are two pending sales and nine active listings, ranging from $339,990 to $423,990.

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.

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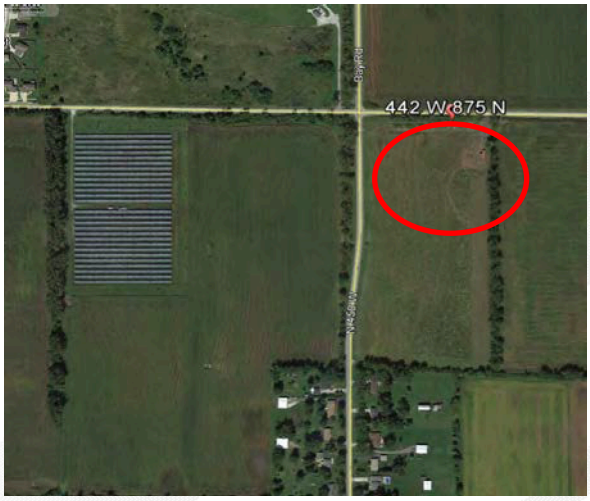

Portage Solar Farm, IN
October 2015

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

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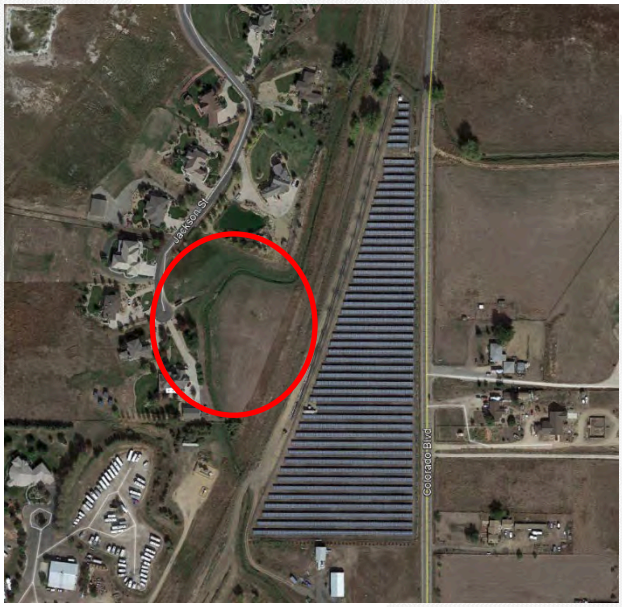
The Brighton PV Solar farm became operational in December 2012. Located in Adams County, north of Denver, CO, this solar farm has a capacity of 1.8 MW AC and is located on a triangular parcel of land east of an area of existing custom-built estate h[redacted] home (15880 [redacted] to the north.

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

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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)
[redacted]		[redacted]	3.50%	[redacted]	[redacted]	[redacted]	243
[redacted]		[redacted]	1.40%	[redacted]	[redacted]	[redacted]	553
[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	300
[redacted]		43.50%	54.30%	[redacted]	[redacted]	[redacted]	481
5	Jefferson County Solar	66.90%	33.10%	0.00%	0.00%	0.00%	709
6	Dominion Indy Solar III	97.70%	2.30%	0.00%	0.00%	0.00%	474
7	O'Brien Solar Fields	94.83%	2.03%	0.00%	0.00%	3.14%	613
8	Portage Solar	65.50%	34.50%	0.00%	0.00%	0.00%	991
9	IMPA Frankton	76.30%	5.70%	0.00%	0.00%	18.00%	236
10	Valparaiso Solar LLC	81.60%	18.40%	0.00%	0.00%	0.00%	659

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 ECA Solar's proposed solar project in terms of adjoining uses, location, and size.

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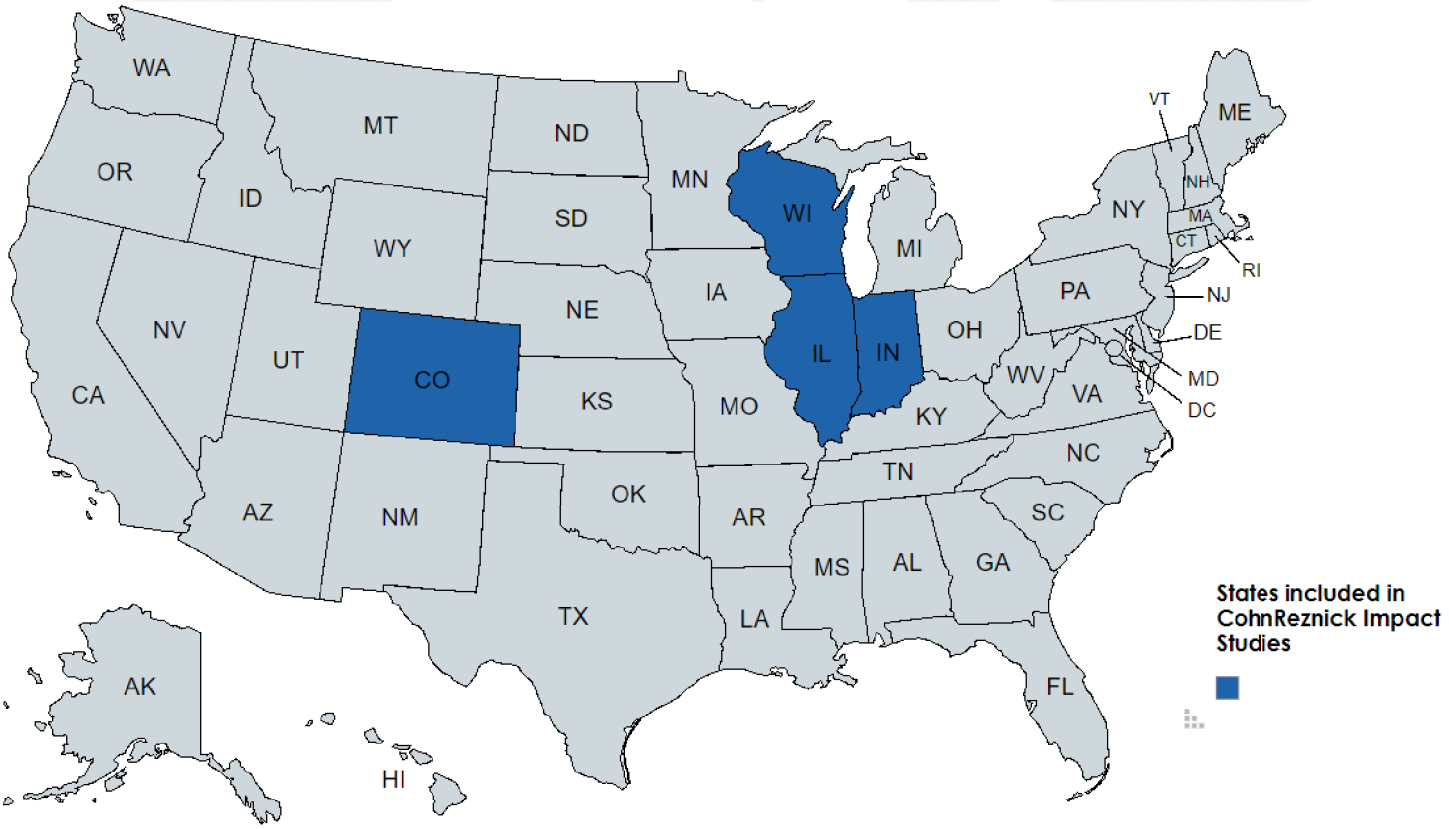
SUMMARY AND FINAL CONCLUSIONS

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.

A summary of the chosen CohnReznick impact studies prepared is presented in the following map and table:



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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	2662 Freeport Solar	2	14	$77.33	$76.08	+1.65%	114	243
2	Grand Ridge Solar	1	[redacted]				366	479
[redacted]	[redacted]	1	[redacted]				200	250
[redacted]	[redacted]	[redacted]	[redacted]			-3.03%	55	275
[redacted]	[redacted]	[redacted]	[redacted]			+8.30%	450	575
[redacted]	[redacted]	[redacted]	[redacted]			+13.39%	785	873
[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	30	80
[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	625	660
[redacted]	[redacted]	[redacted]	8			+4.78%	240	350
[redacted]	[redacted]	7	11			+0.65%	165	300
[redacted]	[redacted]	1	45	[redacted]	[redacted]	[redacted]	495	530
	O'Brien Solar Fields Group 2	1	22	$250.24	$247.38	+1.16%	465	515
8	Portage Solar Group 2	1	7	$84.35	$84.27	+0.10%	1,070	1,233
9	IMPA Frankton Solar Group 1	1	6	$28.58	$28.42	+0.56%	120	153
	IMPA Frankton Solar Group 2	1	5	$52.40	$51.47	+1.81%	163	415
10	Valparaiso Solar Group 1	1	5	$82.42	$79.95	+3.09%	323	516
Median Variance in Sale Prices for Test Area Sales to Control Area Sales						**+0.90%**		
30 Adjoining Test Area Sales studied and compared to 182 Control Area Sales								
** Note, the paired sale analysis for this group is an outlier as determined earlier in this report and was excluded from this summary table.*								

Land (Agricultural/Single Family Lots)								
6	Dominion Indy Solar III Group 1	1	4	$8,210	$8,091	+1.47%	280	-
8	Portage Solar Group 1	1	9	$8,000	$7,674	+4.25%	845	-
Median Variance in Sale Prices for Test to Control Areas						**+2.86%**		
2 Adjoining Test Area Sale studied and compared to 13 Control Area Sales								

As summarized above, we evaluated 32 property sales adjoining existing solar facilities (Test Area Sales) and 195 Control Area Sales. In addition, we studied a total of 27 Test Area Sales and 53 Control Area Sales in three Before and After analyses. In total, we have studied over 305 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.

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.

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If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick LLP

[redacted]

Principal
Certified General Real Estate Appraiser
Illinois License No. 553.001841
Expires 9/30/2025
Pennsylvania License No. GA004632
Expires 6/30/2025
Indiana License No. CG41500037
Expires 6/30/2026

[redacted]

Director
Certified General Real Estate Appraiser
Arizona License No. 32052
Expires 12/31/2024
Oregon License No. C001551
Expires 6/30/2026
California License No. 3004919
Expires 11/13/2025

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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 conc[redacted]only by the reported [redacted]iting conditions, and a[redacted]ofessional analyses, [redacted] prospective interes[redacted]ort and no personal [redacted] services, as an appra[redacted]the property that is [redacted]port within the three[redacted]cceptance 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.

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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 [redacted] s otherwise stated. The legal description used in this repo[redacted]

[redacted] s otherwise stated.

[redacted] o warranty is given

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.

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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.

[redacted] the appraisal analysis [redacted] is either proposed [redacted] from the property's [redacted] accordingly.

[redacted] ked burial grounds [redacted] nt or hamper the deve [redacted]

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.

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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 estim[redacted] the improvements [redacted] the stated program o[redacted] ed to the land and [redacted] lid if so used.

[redacted] any, and we have [redacted] r removal of such [redacted] herwise noted in the e[redacted].

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

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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 associa[redacted]e purpose of, and [redacted]nvestment or gain fro[redacted]not limited to a sale [redacted]nt of [redacted]which is required to [redacted]any state regulatory [redacted]at any user of this [redacted]appraisers and the [redacted]d holds them harmles[redacted], arising from said use.

ADDENDUM A:
APPRAISER QUALIFICATIONS

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Andrew R. Lines, MAI, CRE

Principal – Real Estate Valuation
Valuation Advisory Services

[redacted]

Andrew R. Lines, MAI, CRE is a Principal for CohnReznick Advisory's Valuation Advisory Services practice who has been a CohnReznick employee for over twelve years. Andrew has been involved in the real estate business for more than 20 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). 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)

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Erin C. Bowen, MAI

Director – Real Estate Valuation
Valuation Advisory Services

[redacted]

Erin Bowen, MAI is a Director with CohnReznick in Valuation Advisory Services. Ms. Bowen is based in Phoenix, Arizona, with presence covering the west coast. Ms. Bowen's work in Commercial Real Estate valuation spans over 12 years.

Ms. Bowen specializes in 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 mortgage financing, litigation, eminent domain, tax appeal, estate gifts, asset management, as well as valuation for financial reporting including purchase price allocations (ASC 805). Impact Study Reports have also been generated for zoning hearings related to the development of solar facilities and wind powered facilities. Ms. Bowen has qualified as an expert witness and provided testimony for zoning and county commission hearings.

Education

- Bachelor of Arts, Psychology, Theater, University of California, San Diego 2007, College Honors

Professional Affiliations

- Designated Member of the Appraisal Institute

Licenses

- State of Arizona (Certification #32052)
- State of California (Certification #AG3004919)
- State of Nevada (Certification #A.0208032-CG)
- State of Oregon (Certification #C001551)

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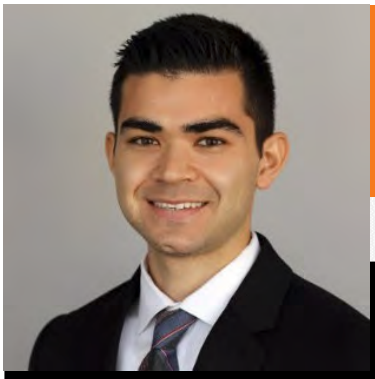

Joe Ficenec

Consultant, Valuation Advisory Services

[redacted]

Joe Ficenec is a consultant in CohnReznick'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. 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

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APPENDIX C

Existing Agricultural Drain Tile Investigation Plan

EXISTING AGRICULTURAL DRAIN TILE INVESTIGATION PLAN

9TH STREET ZION SOLAR

Prepared for: ECA

Section no. 11, Newport Twp., Lake Co., IL

EXISTING SUBSURFACE AGRICULTURAL DRAIN TILE INVESTIGATION REPORT

9TH STREET ZION SOLAR

ECA

9TH STREET ZION SOLAR / ECA , FIELD FILE NO. 10-11-11 , DATE: 9/17/24 .
IN ACCORDANCE W/ LOCAL COUNTY and A.I.M.A. EXISTING DRAIN TILE INVESTIGATION & LOCATION STANDARDS
COPYRIGHT © 2024, BY HUDDLESTON MCBRIDE LAND DRAINAGE COMPANY

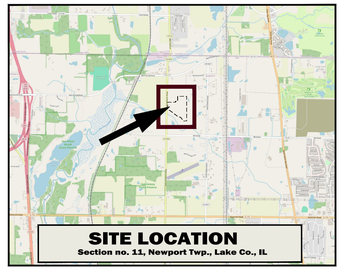
DESCRIPTION CHART NO. 1A : INVESTIGATION SLIT TRENCH LOCATIONS

ID NO.	SZ.	TYPE / QUALITY	FLOW %	SILT %	DEPTH GRD./INV.	FIELD NOTES:
A	---	NO DRAIN TILE			---	NO DRAIN TILE LOCATED
B1	6"	CLAY / GOOD	SLIGHT	CLEAN	45"	ACTIVE FLOW RATE AND CAPACITY
C	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
D	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
E1	3"	CLAY / GOOD	SLIGHT	20%	29"	ACTIVE FLOW RATE AND CAPACITY
E2	6"	CLAY / GOOD	SLIGHT	CLEAN	35"	ACTIVE FLOW RATE AND CAPACITY
F1	5"	CLAY / GOOD	SLIGHT	CLEAN	34"	ACTIVE FLOW RATE AND CAPACITY
G1	6"	CLAY / GOOD	SLIGHT	CLEAN	54"	ACTIVE FLOW RATE AND CAPACITY
G2	3"	CLAY / GOOD	SLIGHT	CLEAN	39"	ACTIVE FLOW RATE AND CAPACITY
H	---	NO DRAIN TILE			---	NO DRAIN TILE LOCATED
I1	6"	CLAY / GOOD	SLIGHT	CLEAN	33"	ACTIVE FLOW RATE AND CAPACITY
I2	6"	CLAY / GOOD	SLIGHT	CLEAN	22"	ACTIVE FLOW RATE AND CAPACITY
I3	6"	CLAY / GOOD	SLIGHT	CLEAN	42"	ACTIVE FLOW RATE AND CAPACITY
I4	3"	CLAY / GOOD	SLIGHT	40%	36"	SILT RESTRICTED / PARTIAL CAPACITY
J	---	NO DRAIN TILE			---	NO DRAIN TILE LOCATED
K	---	NO DRAIN TILE			---	NO DRAIN TILE LOCATED
L1	3"	CLAY / GOOD	SLIGHT	30%	30"	SILT RESTRICTED / PARTIAL CAPACITY
L2	3"	CLAY / GOOD	SLIGHT	10%	29"	ACTIVE FLOW RATE AND CAPACITY
M1	4"	CLAY / GOOD	SLIGHT	10%	26"	ACTIVE FLOW RATE AND CAPACITY
N	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
O	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
P	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED
Q1	5"	CLAY / GOOD	SLIGHT	CLEAN	34"	ACTIVE FLOW RATE AND CAPACITY
R	---	NO DRAIN TILE	---	---	---	NO DRAIN TILE LOCATED

HUDDLESTON McBRIDE LAND DRAINAGE SERVICES PROFESSIONAL ENGINEERING

DESCRIPTION CHART NO. 1B : SURVEY DATA POINT LOCATIONS

DATA POINT	SZ.	TYPE / QUALITY	FLOW %	SILT %	DEPTH RUB./INV.	FIELD NOTES:
1	6"	CLAY / GOOD	SLIGHT	CLEAN	43"	MAINLINE AT PROPERTY INGRESS
2	6"	CLAY / GOOD	SLIGHT	CLEAN	37"	MAINLINE AT PROPERTY INGRESS
3	4"	CLAY / GOOD	SLIGHT	CLEAN	29"	LATERAL AT PROPERTY EGRESS
4	5"	CLAY / GOOD	SLIGHT	CLEAN	36"	LATERAL AT PROPERTY EGRESS
5	8"	CLAY / GOOD	SLIGHT	CLEAN	45"	MAINLINE AT PROPERTY EGRESS



MAP LEGEND :

- EXIST. DRAIN TILE COVER MEASUREMENT, TOP OF TILE TO SURFACE
- EX. POLYETHYLENE MAINLINE OR SYSTEM PART
- EX. CLAY DRAIN TILE MAINLINE OR SYSTEM PARTS
- EX. CONCRETE DRAIN TILE MAINLINE OR SYSTEM PART
- EXISTING DRAIN TILE CONTINUES TO UPLAND WATERSHED
- EXISTING DRAIN TILE OUTLETS TO SURFACE
- EXIST. DRAIN TILE (1) INSPECTION STRUCTURE / (2) CATCH BASIN
- EXIST. DRAIN TILE (1) LOCATED END / (2) ASSUMED END
- EXISTING DRAIN TILE CONTINUES TO OFF-SITE OUTLET SYSTEM
- EXISTING DRAIN TILE FAILURE / FLOW SURCHARGE TO SURFACE
- EXISTING DRAIN TILE MAPPED BY SPECULATION AND ASSUMPTION
- EXISTING DRAIN TILE ABANDONED (NOT FUNCTIONAL)
- EXISTING DRAIN TILE "BLOWOUT" OR FAILURE
- HAND PROBE OR ELECTRONIC SCAN FOR DRAIN TILE LOCATION
- INVESTIGATION SLIT TRENCH FOR INVESTIGATION
- SPECIFIC PIT EXCAVATION FOR INVESTIGATION
- SURVEY DATA POINTS
- REPORT IDENTIFICATION NUMBER

REPORT LEGEND :

ID NO.	POINT OF EXCAVATION FOR SPECIFIC DRAIN TILE INVESTIGATION.
SZ. (SIZE).	DRAIN TILE INTERNAL DIAMETER IN INCHES.
MATERIAL / QUALITY.....	TYPE OF TILE MATERIALS, PIPE QUALITY - GOOD, FAIR & POOR.
FLOW %	PERCENTAGE OF TILE DIAMETER OCCUPIED BY ACTIVE FLOW.
(R)	RESTRICTED OR BACKED UP FLOW, SURCHARGED CONDITION
SILT %	PERCENTAGE OF TILE DIAMETER OCCUPIED BY RESTRICTIVE SILT.
(X)	ABANDONED, FILLED WITH SILT BLOCKAGE, NO FLOW POTENTIAL
DEPTH	MEASUREMENT FROM EXISTING GROUND LEVEL TO PIPE INVERT.

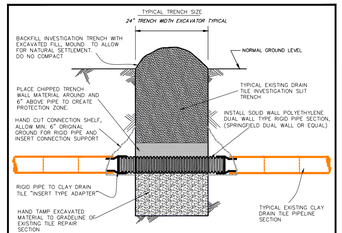
(GENERAL NOTES)

MAINLINE TILE	TRUNK LINE OR MUTUAL DRAIN, COLLECTOR OF SUB-SYSTEMS.
SUB-MAIN TILE.....	SECONDARY TRUNK LINE OR RANDOM SYSTEM COLLECTOR.
LATERAL TILE	FEEDER LINE, SERVICE TILE OR SYSTEM SPUR.
"BLOWOUT"	EXISTING SYSTEM PIPE FAILURE OR RESTRICTION.
DRAIN TILE ENDS	MAINLINE, SUB-MAIN OR LATERAL PLANNED TERMINATION.
SLIT TRENCH	INVESTIGATION TRENCH, TYPICAL 2'- 0" WIDE x 6'- 0" DEPTH.

SPECIAL NOTES :

- *All existing agricultural drain tiles located during this investigation survey have been identified on this plan and field staked at < 50' intervals, in some occasions certain existing local drain tile sections may be speculated and considered as an assumed route which shall be delineated on this plan.*
- *Any existing drain tile not encountered during slit trenching or probe transect procedures will remain unknown.*
- *All existing drain tiles damaged during the investigation process shall be repaired to their original state in accordance with Natural Resource Conservation Service standards for drain tile installation and repair. All existing drain tile not encountered during slit trenching procedure will remain unknown. (Huddleston McBride (62a) typical standard "A")*
- *All existing drain tile location dimensions have been mapped in state plane coordinates by gps survey systems and include sub meter accuracy, all locations pertinent to final design shall be verified by the project surveyor.*
- *This drain tile investigation report is intended to identify existing drain tile mainline systems only with additional priority on drain tiles which may service the upland property of others or with mutual drainage status.*
- *This drain tile investigation report shall be filed with Huddleston McBride Drainage Co., and will be reproduced and disbursed only by permission of the contract principals.*

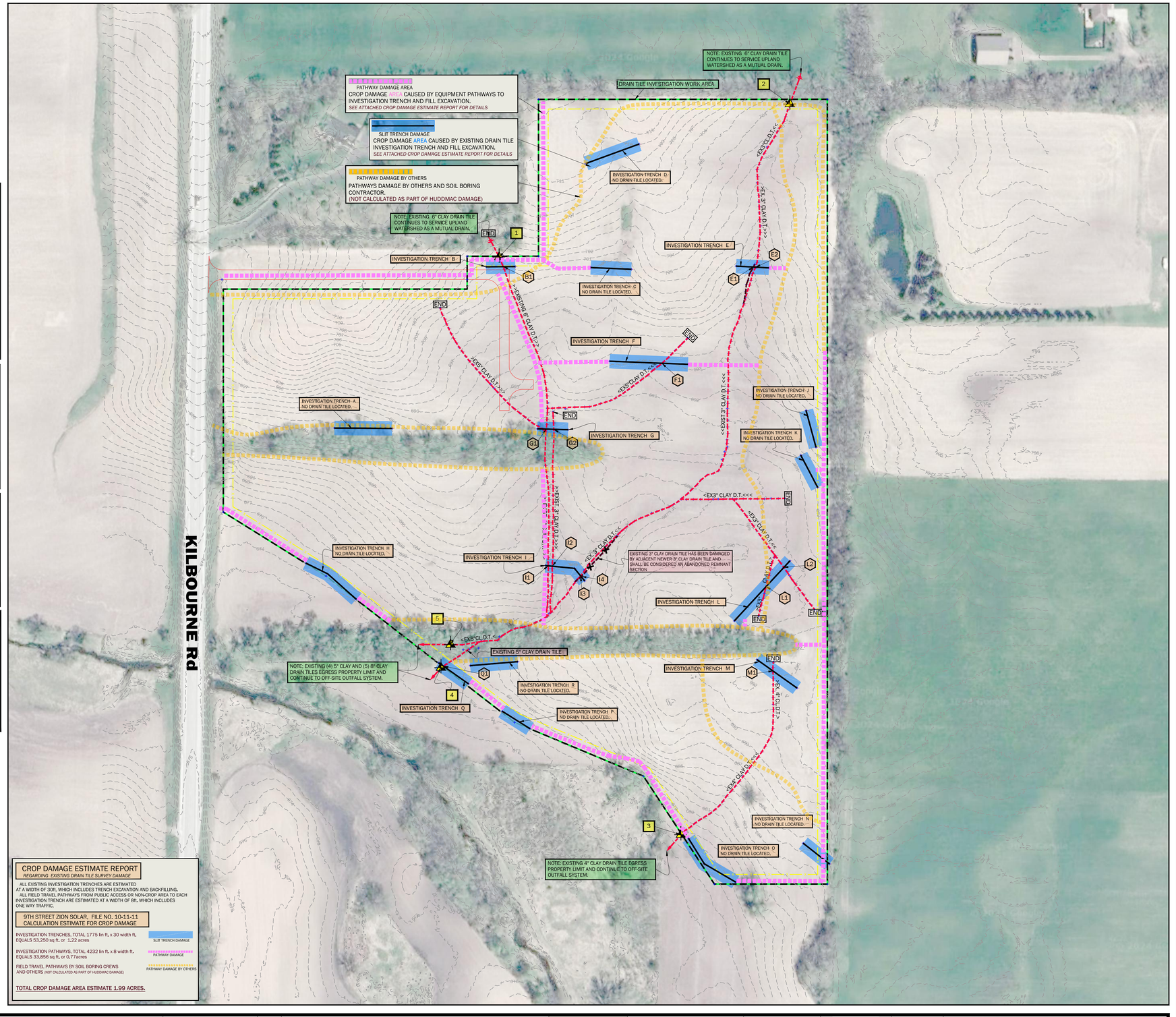
Solar Field Development - It is our recommendation that all existing drain tile systems within the proposed solar field development should be replaced by "like kind" construction which will assure the location and replacement of unknown drain tile systems that were not located by this Existing Drain Tile Investigation.



EXISTING CLAY DRAIN TILE REPAIR SECTION
FOR DRAINAGE INVESTIGATION PROJECTS
EXISTING CLAY AGRICULTURAL DRAIN TILE INVESTIGATION TRENCH STRIKE
TYPICAL REPAIR SECTION FOR DRAIN TILE SLIT TRENCHING
HUDDLESTON DRAINAGE TYPICAL SECTION NO. 62B

TYPICAL CONSTRUCTION SECTION [A].

THESE SYMBOLS REPRESENT SURVEY DATA POINTS WHICH HAVE BEEN STAKED IN THE FIELD FOR THE SPECIFIC PURPOSE OF ELECTRONIC LOCATION AND ELEVATION DETERMINATION BY THE PROJECT SURVEYOR.
THESE DATA POINTS CONSIST OF A 2" X 2" GROUND HUB AND A 3'-0" ON LINE LOCATION STAKE WHICH INCLUDES DATA POINT IDENTIFICATION NUMBER, SEPARATION MEASUREMENT FROM HUB TO PIPE INVERT, AND PIPE SIZE. ALL EXISTING DRAIN TILE ROUTES HAVE BEEN FIELD STAKED WITH "EXISTING DRAIN TILE" PIN FLAGS AT 50' INTERVALS AND DOUBLE FLAGS AT INTERSECTIONS.



CROP DAMAGE ESTIMATE REPORT
REGARDING EXISTING DRAIN TILE SURVEY DAMAGE

ALL EXISTING INVESTIGATION TRENCHES ARE ESTIMATED AT A WIDTH OF 30ft, WHICH INCLUDES TRENCH EXCAVATION AND BACKFILLING. ALL FIELD TRAVEL PATHWAYS FROM PUBLIC ACCESS OR NON-CROP AREA TO EACH INVESTIGATION TRENCH ARE ESTIMATED AT A WIDTH OF 8ft, WHICH INCLUDES ONE WAY TRAFFIC.

9TH STREET ZION SOLAR, FILE NO. 10-11-11
CALCULATION ESTIMATE FOR CROP DAMAGE

INVESTIGATION TRENCHES, TOTAL 1775 lin ft, x 30 width ft, EQUALS 53,250 sq ft, or 1.22 acres — SLIT TRENCH DAMAGE

INVESTIGATION PATHWAYS, TOTAL 4232 lin ft, x 8 width ft, EQUALS 33,856 sq ft, or 0.77acres — PATHWAY DAMAGE

FIELD TRAVEL PATHWAYS BY SOIL BORING CREWS AND OTHERS (NOT CALCULATED AS PART OF HUDDMAC DAMAGE) — PATHWAY DAMAGE BY OTHERS

TOTAL CROP DAMAGE AREA ESTIMATE 1.99 ACRES.

PROJECT CLIENT:

ECA

Colin Walker , Project Manager
203 Crescent Street #106, Waltham, MA., 02453

APPROVED BY AND DATE: RUDY P. DIXON, P.E., 9/17/24	PROJECT DATE: 9/17/24
ACKNOWLEDGMENTS: HUDDLESTON DRAINAGE MAP and ARCHIVE SYSTEMS	FIELD FILE NO.: 10-11-11
DRAWN BY AND DATE: TOM HUDDLESTON 9/17/24	DRAWING NO. 10-11-11_X1
WEATHER CONDITIONS: SUNNY/ WARM - 75o	DRAWING SCALE: 1" TO 100'
	SHEET NO. ONE OF ONE

REVISIONS

DATE:	BY:	DESCRIPTION:

RUDY P. DIXON 062.065333 PROFESSIONAL ENGINEER STATE OF ILLINOIS

1976 HUDDLESTON-McBRIDE CO. 48th Anniversary OF 50 2024 NATIONAL DRAINAGE ASSOCIATION

ILLINOIS FARM BUREAU MEMBER

811 Know what's below. Call before you dig. DIG NUMBER X242340609

NORTH

9TH STREET ZION SOLAR

HUDDLESTON McBRIDE
PROFESSIONAL LAND DRAINAGE SERVICES
Women-Owned Small Business (WOSB)
9504 FOWLER RD., ROCHELLE, ILLINOIS PHONE 815-562-6007

COPYRIGHT © 2024, BY HUDDLESTON LAND DRAINAGE COMPANY

COORDINATE SYSTEM: ILLINOIS STATE PLANE EAST NAD 83

Z:\Shared\Huddmac_Data\ACTIVE CADD\10-11-11@9TH ST ZION SOLAR ECA\EXPORT\10-11-11_X1.dwg, HUDDMAC, 9/17/2024 9:35:09 AM, Tom, AutoCAD PDF (High Quality Print).pc3, ARCH full bleed D (36.00 x 24.00 Inches), 1:200

APPENDIX D

Deed in Trust

3568975

DEED IN TRUST

THIS INDENTURE WITNESSETH, That the Grantor, ELSIE RYSER, divorced and not remarried, of the County of Lake and State of Illinois for and in consideration of TEN AND NO/100 DOLLARS, and other good and valuable consideration in hand paid, Conveys and Quit Claims unto ELSIE RYSER as Trustee under the provisions of a trust agreement dated the 11th day of July, 1993, the following described Real Estate in the City of Zion, County of Lake and State of Illinois, to wit:

The West Half of the Northeast Quarter of Section 11, Township 46 North, Range 11, East of the Third Principal Meridian (excepting therefrom the North 330 feet of the West 688.67 feet thereof) and also the West 4 feet 0 inches of the West Half of the Southwest Quarter of the Southeast Quarter of the Northeast Quarter of said Section 11, Township and Range aforesaid, in Lake County, Illinois.

Permanent Tax Number: 03-11-200-002-0011

commonly known as 14280 West Ninth Street, Zion, Illinois 60099

TO HAVE AND TO HOLD the said premises with the appurtenances upon the trusts and for the uses and purposes herein and in said trust agreement set forth. Full power and authority is hereby granted to said trustee to improve, manage, protect and subdivide said premises or any part thereof, to dedicate streets, highways or alleys and to vacate any subdivision or part thereof, and to resubdivide said property as often as desired, to contract to sell, to grant options to purchase, to sell on any terms, to convey either with or without consideration, to convey said premises or any part thereof to a successor or successors in trust and to grant to such successor or successors in trust all of the title, estate, powers and authorities vested in said trustee, to donate, to dedicate, to mortgage, pledge or otherwise encumber said property, or any part thereof, to lease said property, or any part thereof, from time to time, in possession or reversion, by leases to commence in praesenti or futuro, and upon any terms and for any period or periods of time, not exceeding in the case of any single demise the term of 198 years, and to renew or extend leases upon any terms and for any period or periods of time and to amend, change, or modify leases and the terms and provisions thereof at any time or times hereafter, to

contract to make leases and to grant options to lease and options to renew leases and options to purchase the whole or any part of the reversion and to contract respecting the manner of fixing the amount of present or future rentals, to partition or to exchange said property, to grant easements or charges of any kind, to release, convey or assign any right, title or interest in or about or easement appurtenant to said premises or any part thereof, and to deal with said property and every part thereof in all other ways and for such other considerations as it would be lawful for any person owning the same to deal with the same, whether similar to or different from the ways above specified, at any time or times hereafter.

In no case shall any party dealing with said trustee in relation to said premises, or to whom said premises or any part thereof shall be conveyed, contracted to be sold, leased or mortgaged by said trustee, be obliged to see to the application of any purchase money, rent, or money borrowed or advanced on said premises, or be obliged to see that the terms of this trust have been complied with, or be obliged to inquire into the necessity or expediency of any act of said trustee, or be obliged or privileged to inquire into any of the terms of said trust agreement; and every deed, trust deed, mortgage, lease or other instrument executed by said trustee in relation to said real estate shall be conclusive evidence in favor of every person relying upon or claiming under any such conveyance, lease or other instrument, (a) that at the time of the delivery thereof the trust created by this indenture and by said trust agreement was in full force and effect, (b) that such conveyance or other instrument was executed in accordance with the trust, conditions and limitations contained in this indenture and in said trust agreement or in some amendment thereof and binding upon all beneficiaries thereunder, (c) that said trustee was duly authorized and empowered to execute and deliver every such deed, trust deed, lease, mortgage or other instrument and (d) if the conveyance is made to a successor or successors in trust, that such successor or successors in trust have been properly appointed and are fully vested with all the title, estate, rights, powers, authorities, duties and obligations of its, his, her, or their predecessor in trust.

The interest of each and every beneficiary hereunder and of all persons claiming under them or any of them shall be only in the earnings, avails and proceeds arising from the sale or other disposition of said real estate, and such interest is hereby declared to be personal property, and no beneficiary hereunder shall have any

title or interest, legal or equitable, in or to said real estate as such, but only an interest in the earnings, avails and proceeds thereof as aforesaid.

IN WITNESS WHEREOF, the Grantor aforesaid has hereunto set her hand and seal this 21st day of June, 1994.

[redacted]

GRANTOR

THIS INSTRUMENT WAS PREPARED BY:

Patricia K. Hogan
330 North Wabash, Suite 2929
Chicago, Illinois 60611

RECORDING FEE-REC'D

3568975
LAKE COUNTY, ILLINOIS
94 JUL 19 AM 8:39
[redacted]

STATE OF ILLINOIS)
) SS:
COUNTY OF COOK)

I, Patricia K. Hogan, a Notary Public in and for said County, in the state aforesaid, do hereby certify that Elsie Ryser, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he or she signed, sealed, and delivered the said instrument as his or her free and voluntary act, for the uses and purposes therein set forth.

Given under my hand and notarial seal this 21st day of June, 1994.

[redacted]

Patricia K. Hogan

" OFFICIAL SEAL "
PATRICIA K. HOGAN
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 3/19/96

Street Address of Property:

14280 W. Ninth Street

Zion, Illinois 60099

3568975

I HEREBY DECLARE THAT THE ATTACHED DEED PRESENT A TRANSACTION EXEMPT UNDER PROVISIONS OF PARAGRAPH E, SECTION 4 OF THE REAL ESTATE TRANSFER ACT AND LAKE C[redacted]

GRANTOR/GRANTEE

APPENDIX E

Real Estate Purchase Agreement

DocuSign Envelope ID: 0C1291D6-9EEE-4613-BD77-E6183B6E9B92

REAL ESTATE PURCHASE AGREEMENT

This Real Estate Purchase Agreement ("Agreement") is made on this 7th day of August, 2023, by and between Frank Ryser as trustee under a trust agreement dated July 11, 1993 ("Seller"), whose address is [redacted] and Greenpath Zion LandCo, LLC, an Illinois limited liability company ("Buyer"), whose mailing address for notice purposes is [redacted].

Seller agrees to sell to Buyer, and Buyer agrees to purchase from Seller, subject to the terms and conditions set forth in this Agreement, certain real property, commonly known as: 14280 W. 9th St., Zion, Illinois 60099 with a PIN of 03-11-200-002, which shall exclude approximately five (5) acres of the southwest corner of said PIN ("Property"). The excluded area in the attached Exhibit A-2 is for illustrative purposes only, the actual excluded area shall include the well at the north end of the excluded area and the final excluded area shall run with any natural boundaries and shall be approved by both Buyer and Seller before Closing. Seller shall be responsible for subdividing the excluded area, as approved by both Parties, after the Buyer has exercised the Option and before Closing. Any expenses/costs incurred as a result of said subdivision shall be split by the Parties with the Buyer providing a credit to the Seller for its share of the subdivision costs at Closing. . The purchase and sale transaction provided for in this Agreement is sometimes referred to as the "Purchase".

1. **Purchase Price.** [redacted]

2. **Deposit.** As evidence of good faith and to bind this Agreement, Buyer shall pay the sum of [redacted] (the "Deposit") to Seller or its agent within ten (10) days of signing this Agreement. During this ten-day period and prior to the payment of the initial deposit, Buyer retains the right to terminate this Agreement. The Deposit shall be credited to the Purchase Price if the purchase is completed. Said Deposit shall only be refundable in the event of Seller's default of this Agreement or as otherwise provided pursuant to this Agreement. For additional payment terms and conditions, see the Addendum attached hereto.

3. **Inspection and Use Contingency.** Commencing on the Effective Date, the Buyer shall have eighteen (18) months to conduct its inspections and diligence, obtain financing (if the Buyer so elects) and to obtain any approvals needed for Buyer's intended use of the Property (the "Inspection Period"), Buyer shall notify Seller at least 24 hours prior to entering the property to conduct its due diligence and upon such notice, Seller agrees to provide access to the Property and utilities serving the Property. Buyer shall, upon completion of its tests, fill in any holes created as a result of Buyer's testing and repair any damage caused by Buyer. Buyer, on behalf of Buyer and Buyer's agents, representatives, and contractors while on the Property, shall indemnify, defend, and hold Seller harmless from any claims and expenses, and injuries to Buyer or other persons and damage to the Property resulting from Buyer's inspection of the Property and such indemnification shall survive the termination of this Agreement or Closing (defined below). Buyer shall provide Seller with evidence of appropriate liability insurance before inspecting the Property. In the event the Buyer is not satisfied with its inspections or unable to obtain such plan approvals, the Buyer at its own discretion may terminate this entire Agreement and have no further obligations to the Seller, except for Buyer's obligations set forth above with

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respect to the indemnity and restoration of the Property which shall survive termination of this Agreement and all other provisions set forth herein that are to survive termination of this Agreement. During the Inspection Period and upon request, and to the extent available and in possession and control of the Seller, Seller will deliver to Buyer a copy of documents related to the building or equipment at the Property.

4. Title Commitment. Within ten (10) days of the Effective Date, Seller shall furnish to Buyer, at Seller's expense, a Title Commitment to issue an owner's title insurance policy insuring Buyer in the amount of the Purchase Price. The Title Commitment must show that Seller has good and marketable title to the Property and that a policy with standard exception will be issued at Closing.

5. Title Objections; Sellers Remedy. If reasonable objection(s) to the title are made within ten (10) days of receiving the Title Commitment based upon a written opinion of Buyer's attorney that the title is not in the condition as required for performance herein, Seller shall have ten (10) days from the date of the written notice ("Cure Period") within which Seller may (but shall not be required to) cure or remove each such objection, or obtain title insurance against such objectionable condition in a manner acceptable to Buyer. If Seller fails to either cure or remove an objection or obtain such title insurance with respect to the Property to the reasonable satisfaction of Buyer prior to the expiration of the Cure Period, Buyer may either terminate this Agreement without liability except for Buyer's obligations set forth herein that are to survive termination of this Agreement or waive such objection and accept the condition of such title to the Property as set forth in the Title Commitment without any reduction in the Purchase Price.

6. Survey. If Buyer requires a survey as part of this transaction, Buyer shall be responsible for any and all survey costs.

7. Buyer's Representations and Warranties. Buyer represents and warrants to Seller: (a) Buyer has all necessary power and authority to enter into and perform this Agreement; (b) Buyer has taken all necessary action to approve, execute, deliver, and perform this Agreement; (c) this Agreement will be the valid and binding obligation of Buyer, enforceable against Buyer in accordance with its terms, and all documents and agreements executed and delivered by Buyer in connection with the Purchase shall be binding upon, and enforceable against Buyer; and (d) No judgement is outstanding against Buyer and no litigation, action, suit, judgment, or proceeding is pending or outstanding before any forum, court, or governmental body, department, or agency, or to the knowledge of Buyer, threatened, that has the stated purpose of enjoining or preventing the Closing.

8. Seller's Representations and Warranties. Seller represents and warrants to Buyer: (a) Seller has all necessary power and authority to enter into and perform this Agreement; (b) Seller has taken all necessary action to approve, execute, deliver, and perform this Agreement, and this Agreement is the valid and binding obligation of Seller, enforceable against Seller in accordance with its terms; (c) To Seller's actual knowledge no litigation, action, suit, judgement, or proceeding is pending or outstanding before any forum, court, or governmental body, department, or agency, or, to the actual knowledge of Seller, threatened, that has the stated purpose of enjoining or preventing the Closing; and (d) To the actual knowledge of Seller, there

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is no lease, occupancy agreement or any right whatsoever in any party to occupy the Property, or any part thereof.

9. Closing. The closing ("Closing") shall take place within seven (7) days of BUYER's notice to exercise its option to purchase, subject to any reasonable delays required for subdivision of the Property regarding the excluded area. Upon exercise of Buyer's option to purchase the Property, the Buyer shall be deemed to have waived the Inspection Period of this Agreement. The Parties to this Agreement may close in separate locations. At Closing, upon payment in full of the Purchase Price, Seller agrees to deliver to Buyer a Special Warranty Deed to the Property, the parties will execute closing statements and they agree to execute any additional documents reasonably requested by the parties or the Title Company to carry out the intent of this Agreement. Buyer shall be given possession of the Property at Closing, subject to the lease for farming that has previously been disclosed to Buyer.

Seller shall pay (a) fees of any counsel or other financial advisors representing it in connection with such transaction, (b) the cost of the Title Policy, (c) any transfer tax, documentary stamp tax, or similar tax which becomes payable by reason of the transfer of the Property that is payable by the Seller, (d) one-half of the fee charged by the Title Company to handle the Closing, and (e) the Broker commissions to the Broker referenced in paragraph 14(a) below. Buyer shall pay (1) the Purchase Price, less the Deposit, and prorated items, (2) all recording and filing fees for transfer of the Property, (3) the fees of any counsel, financial adviser, or broker representing Buyer in connection with the Purchase, (4) the fees for all third party consulting or due diligence work contracted for by Buyer, including, but not limited to, any engineering reports and environmental site assessments, (5) Policy or any other additional title insurance coverage requested by Buyer or its Lender, and (6) any transfer tax, documentary stamp tax, or similar tax which becomes payable by reason of the transfer of the Property that is payable by the Buyer. All other costs and expenses of the parties to pay the amounts stated above shall survive the Closing such that if any amounts to be paid become known following the Closing, the responsible party shall pay the required amounts promptly upon being informed of the amount owing.

10. Taxes, Assessments, and Water. Seller shall pay all and any real estate taxes, water, and sewer charges, and any special assessment installments that become due before Closing. Seller shall pay any and all real estate tax bills that are available in full and any unbilled real property taxes shall be prorated on a calendar date basis and on assumption that such taxes are paid in arrears. If the amount of taxes is not then ascertainable, the adjustment thereof shall be on the basis of 105% of the amount of the most recent ascertainable fully year tax bill.

11. Buyer's Default. If the conditions of this Agreement are met and the Buyer defaults in Buyer's obligations so that the Closing does not occur within the period outlined and subject to such conditions as outlined in Addendum A hereto, then Seller, in Seller's sole discretion, may either (a) terminate this Agreement by written notice to Buyer and be entitled to the Deposit, or (b) reasonably extend the closing date for Buyer to perform.

12. Seller's Default. In the Event of a default by Seller, and after providing Seller with prior thirty (30) day written notice and cure period, Buyer at its own sole choice may (a) terminate this Agreement and the entire Deposit shall be immediately returned to the Buyer, (b) reasonably

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extend the closing date for Seller to perform, or (c) seek equitable relief of specific performance against Seller in a court of competent jurisdiction.

13. Eminent Domain. Seller shall promptly notify Buyer of any impending or actual condemnation proceedings against any portion of the Property of which Seller has actual notice or knowledge of. If, before Closing, all or any party of the Property is taken by eminent domain, Buyer may terminate this Agreement. In the event of such eminent domain action, neither Seller nor Buyer shall have any further obligation to the other party, excepting those obligations that specifically survive termination and the Deposit will be immediately returned to the Buyer.

14. Miscellaneous.

(a) Seller has engaged the services of Chaz Walters of Coldwell Banker to represent Seller, with the fee for this service being an obligation of the Seller. The Buyer represents and covenants to the Seller that it has not utilized and will not utilize the services of any broker or finder in connection with this transaction. Buyer shall defend, indemnify, and hold Seller harmless from all liability for brokerage commissions, finder's fees, or the like arising in connection with the sale of the Property, other than any such amounts claimed by Chaz Walters of Coldwell Banker, with the fee for this service being an obligation of the Seller. The Conversely, Seller shall defend, indemnify, and hold Buyer harmless from all liability for brokerage commissions, finder's fees or the like arising in connection with the sale of the Property, should any party claim to have been retained by Buyer.

(b) This Agreement contains the entire agreement of the parties and may not be modified except by an agreement in writing signed by both Seller and Buyer. No statement, representation, warranty, covenant, or agreement of any kind not expressly set forth in this Agreement shall affect, or be used to interpret, change or restrict, the express terms and provisions of this Agreement.

(c) Each part to this Agreement acknowledges and agrees that: (i) such party and the party's counsel have reviewed, or have had the opportunity to review and negotiate, the terms and provisions of this Agreement and have contributed to its review and revision; (ii) any rule of construction to the effect that any ambiguities are resolved against the drafting party shall not be used to interpret this Agreement; and (iii) the terms and provisions of this Agreement shall be construed fairly as to all parties to this Agreement for the preparation of this Agreement. Where the transaction involves financial and tax consequences, the parties acknowledge that they have been advised to seek the advice of their accountant or financial advisor.

(d) This Agreement shall bind and benefit Seller and Buyer and their respective successors and assigns. Buyer may not assign their Agreement without the prior written consent of Seller.

(e) Time is of the essence of this Agreement. If the date for Closing, for delivery of a document, or for giving notice falls on a Saturday, Sunday, or bank holiday, then it shall

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be automatically deferred to the next business day that is not a Saturday, Sunday, or bank holiday.

(f) Any and all notices permitted or required to be given hereunder shall be in writing and shall be either (i) personally delivered to the party, (ii) sent by the U.S. registered or certified mail, or (iii) sent by a reputable express mail company which guarantees next day delivery, or (iv) sent by email, at the following addresses:

If to Seller:
Frank Ryser
[redacted]

With a copy to:

Winand & Loudenslagel Law Group LLC
Attn: L. Matthew Loudenslagel, Esq.
[redacted]

If to Buyer:

c/o ECA Solar LLC
Attn: Todd Fryatt
[redacted]

(g) Buyer's rights hereunder may be assigned at any time prior to Closing subject to the prior written approval of the Seller, which approval may be withheld by Seller in Seller's sole discretion.

(h) The terms and provisions of this Agreement may be waived, or consent for the departure from the terms and provisions may be granted, only by written document executed by the parties. No waiver or consent shall be deemed to be or shall constitute a waiver or consent with respect to any other terms or provisions of this Agreement, whether or not similar. Each waiver or consent shall be effective only in the specific instance and for the purpose for which it was given and shall not constitute a continuing waiver or consent.

(i) This Agreement and the rights and obligations of the parties under this Agreement shall be governed and interpreted by Illinois law, without giving effect to the conflict of law principles of the State of Illinois.

(j) In the event that any court of competent jurisdiction shall determine that any provision or any portion of a provision, contained in this Agreement shall be unenforceable in any respect, then the provision shall be deemed limited to the extent

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that the court deems it enforceable, and as so limited shall remain in full force and effect. In the event that the court shall deem any provision, or portion of any provision, wholly unenforceable, the remaining provisions of this Agreement shall nevertheless remain in full force effect.

(k) The headings and captions of various subdivisions of this Agreement are for convenience of reference only and shall in no way modify or affect the meaning or construction of any of the terms or provisions of this Agreement.

(l) This Agreement may be signed in one or more counterparts, and by different parties to this Agreement on separate counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same document. Faxed signatures, or scanned and electronically transmitted signatures, on this Agreement or any notice delivered pursuant to this Agreement, shall be deemed to have the same legal effect as original signatures.

(m) Seller and Buyer each hereby acknowledge that the content of this Agreement and any related documents constitute confidential information. Seller and Buyer shall each keep such confidential information strictly: neither Seller nor Buyer shall disclose this Agreement, or any information set forth herein to any person or entity, other than such party's own employees, attorneys, lenders and consultants, without the prior written consent of the other party hereto.

(n) Buyer or Seller will not be deemed to be in default or otherwise responsible for delays or failures in performance resulting from acts of God; acts of war or civil disturbance; governmental action or inaction; fire; earthquakes; or other causes beyond either party's reasonable control.

(o) The undersigned parties hereto agree to cooperate with each other in every reasonably way in carrying out the transaction contemplated hereby and obtaining and delivering all required closing documents.

15. Tax Deferred Exchange. Seller and Buyer may desire to complete a tax-free exchange (either regular or reverse) under Section 1031 of the Internal Revenue Code in connection with the sale or purchase of the Property, in which event Settlement shall be coordinated with a qualified delayed exchange intermediary as the exchange facilitator with full powers to complete the exchange. The exchange facilitator will instruct Seller or Buyer as to the way title to the Property shall be conveyed to the Buyer. There will be no additional expenses to Seller, as a result of Buyer completing a tax-free exchange, nor to Buyer because of the Seller completing a tax-free exchange. Seller and Buyer agree to cooperate with one another and their respective exchange facilitator to allow the completion of the exchange. Seller shall indemnify and hold Buyer harmless from any liability or expense because of Seller completing a tax-free exchange of the Property, and Buyer shall indemnify and hold Seller harmless from any liability or expense as a result of Buyer completing a tax-free exchange of the Property. In no event shall: (i) such tax-free exchange delay Settlement; or (ii) either party be required to take title to any third-party Property.

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16. Entire Agreement. This Agreement shall serve as the entire understanding between the parties and may not be modified except by an agreement in writing signed by both Seller and Buyer.

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ACCEPTANCE

Seller and Buyer have signed or cause this Real Estate Sake Agreement to be signed by them or their duly authorized representatives as of the date(s) set forth and have the full authority to enter into this Agreement. The Parties hereto have executed, understood, and accepted this Agreement.

Seller and Buyer acknowledge receipt of a copy of this Agreement and that both Seller and Buyer have accepted this Agreement as presented. The Effective Date shall be the date the last party hereto signs this Agreement.

SELLER:

By: [redacted]

Date: 8/8/23

BUYER:

By: [redacted]

Date: 8/7/2023

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eca solar

ECA Solar [redacted]

Addendum to Standard Agreement
Additional Provisions – Illinois
14280 W 9th St, Zion, Lake County
Parcel ID: 0311200002
Seller: Frank Ryser as trustee under a trust agreement dated July 11, 1993
Buyer: Greenpath Zion Landco LLC or Affiliate

1. This Agreement creates an Option to Purchase the portion of the property shown for illustrative purposes only in the Exhibit A-2, excluding such portion in red, located at 14280 W 9th St, Zion, IL 60099, having GPS coordinates 42.4823994759329, -87.9106926022638 pursuant to the terms of the Real Estate Purchase Agreement executed on August 7, 2023, by and between Frank Ryser as trustee under a trust agreement dated July 11, 1993 ("Seller"), and Greenpath Zion Land Co, LLC, an Illinois limited liability company ("Buyer"). This Agreement shall supplement any prior contract or promise between the Parties hereto. For any conflict between this Agreement, the Real Estate Purchase Agreement, and any other agreement or promise between the Parties hereto, the terms of this Agreement shall control.

3. SELLER represents that there are no Leases, Tenants, Occupants, or Rental Contracts with respect to the Premises other than those disclosed by SELLER.

4. Notwithstanding any other provision of this Agreement, this Agreement may be assigned by BUYER to an affiliate of BUYER without the consent of SELLER. In the event of the BUYER'S assignment, BUYER shall remain liable for the performance of the terms and conditions. Any assignment of this Agreement shall be to an affiliate of BUYER and such assignment shall not be considered a transfer for purposes of or as defined by the Illinois State tax code.

5. This Agreement shall be fully contingent upon BUYER's ability to obtain all necessary permits and approvals for the development, construction, operation, and maintenance of a ground-mounted solar photovoltaic energy generation facility, including satisfactory interconnection approval from the relevant utility during the Inspection Period of the Real Estate Purchase Agreement. Should BUYER be unable to obtain any such permits and approvals, BUYER shall have a Right to Terminate this Agreement within the Inspection Period of the Real Estate Purchase Agreement as defined therein, and all parties shall be relieved of their obligations. Any money paid to the SELLER shall be non-refundable as described at Exhibit A-1 of this Agreement. For the avoidance of doubt, all payments shall be at BUYER'S sole option and shall entitle BUYER to the additional diligence period(s) stated in the Option Payment Schedule shall be as shown on the attached Exhibit A-1.

BUYER reserves the right to cancel this contract at any time by written notice to SELLER, and no further payment shall be due and/or owing. BUYER shall notify SELLER at least 10 business days prior to the expiration of each due diligence period if BUYER intends to terminate the agreement or make the next deposit. In the event that Buyer fails to terminate this Agreement and also fails to make the deposit payment as specified herein, Seller shall provide written notice of the Buyer's failure to make said deposit payment and Buyer shall have five (5) days to make said deposit payment. If the deposit payment is not received by the Seller within five (5) days of said written notice, then this Agreement and the underlying Real Estate Purchase Agreement shall be automatically terminated and the Seller shall be entitled to keep all deposits and payments made to date with no further obligations pursuant to this

[redacted]

Agreement and/or the Real Estate Purchase Agreement. The Option Payment Schedule shall be as shown on the attached Exhibit A-1. All Payments shall be non-refundable and shall be in addition to the purchase price at closing.

6. LITIGATION - The SELLER is not aware of any suits, actions, orders, decrees, claims, writs, injunctions or proceedings pending or threatened against the SELLER or affecting all or any part of the Premises or the operation thereof before any court or administrative agency or officer which, if adversely determined, would have a material adverse effect upon the Premises. SELLER will not initiate any such proceedings and will promptly notify BUYER if SELLER receives written notice of any such proceeding commenced by third parties.

7. BANKRUPTCY/FORECLOSURE - There is no pending bankruptcy, mortgage foreclosure, or other proceeding which might in any material way impact adversely on SELLER's ability to perform under this Agreement. In the event that SELLER files for bankruptcy, or if involuntary proceedings are instituted against SELLER, BUYER may, at BUYER's election, terminate this Agreement by written notice to the SELLER whereupon any payments made under this Agreement shall be forthwith refunded to the BUYER and all other obligations of the Parties hereto shall cease and this Agreement shall be void without recourse to the Parties hereto.

8. "AS IS" TRANSACTION - EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT OR ANY OTHER AGREEMENT OR INSTRUMENT EXECUTED AND DELIVERED IN CONNECTION WITH THE TRANSACTION CONTEMPLATED BY THIS AGREEMENT, AND MORE SPECIFICALLY, WITH THE EXCEPTION OF SELLER'S REPRESENTATIONS AND WARRANTIES SET FORTH WITHIN THIS AGREEMENT, PURCHASER SPECIFICALLY ACKNOWLEDGES AND AGREES THAT SELLER IS SELLING, AND PURCHASER IS PURCHASING, THE REAL ESTATE ON AN "AS IS WITH ALL FAULTS" BASIS, AND THAT, EXCEPT FOR SELLER'S REPRESENTATIONS AND WARRANTIES CONTAINED IN THIS AGREEMENT OR IN ANY DOCUMENT DELIVERED AT CLOSING, PURCHASER IS NOT RELYING ON ANY REPRESENTATIONS OR WARRANTIES OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, FROM SELLER, ITS EMPLOYEES, DIRECTORS, OFFICERS, AGENTS, CONSULTANTS, CONTRACTORS, SUBCONTRACTORS OR BROKERS AS TO ANY MATTERS CONCERNING THE REAL ESTATE OR ANY OF THE IMPROVEMENTS, INCLUDING, WITHOUT LIMITATION, ANY INFORMATION CONTAINED IN ANY REPORT, PLAN OR OTHER WRITTEN MATERIAL GIVEN BY SELLER WITH RESPECT TO THE REAL ESTATE.The SELLER represents to the best of the SELLER'S knowledge and belief that, other than reasonable quantities of normal household products and/or chemicals customarily used for farming and/or the raising of livestock, there has been no release of any toxic or hazardous substances and no such toxic or hazardous substances have been used, released, generated, stored, treated, disposed of, or otherwise deposited, in, on, about or from the Premises. If any release of hazardous materials on the site are discovered, then the Seller shall have the right to terminate this Agreement pursuant to the Inspection Period of the Real Estate Purchase Agreement.

9. This Agreement shall be read as the complete contract between the BUYER and SELLER. If a section of this Agreement is deemed to be invalid, its invalidity shall not impinge on the validity of the remaining sections of this Agreement and they shall remain in full force and effect.

[redacted]

10. Without limitation of any other provisions in this Agreement, said premises shall not be considered to be in compliance with the provisions of this Agreement with respect to Title unless:

a. All buildings, structures and improvements, including but not limited to any driveways, garages, and cesspools, and all means of access to the Premises shall be located completely within the boundary lines of the Premises and shall not encroach upon or under the property of any other person or entity, except pursuant to a validly recorded, indefeasible easement;

b. No building, structure or improvement of any kind belonging to any other person or entity shall encroach upon or under the Premises; and

c. The premises shall abut a public way, duly laid out or accepted as such by the municipality, or a private way or ways to which the premises shall have the benefit of an indefeasible right to use for all purposes for which streets and ways are customarily used in the said municipality and which private way or ways shall connect to a public way. SELLER shall give BUYER access through the reserved parcel on the east side, which shall have access to 9th street. Following any subdivision, BUYER shall reserve an easement over the parcel for access purposes. ;

d. Title to the premises is insurable, for the benefit of the BUYER, by a nationally-recognized title insurance company, in a fee owner's policy of title insurance at normal premium rates, in the American Land Title Association form currently in use, subject only to those printed exceptions to title normally included in the "jacket" to such form or policy, or otherwise referenced in this Agreement;

e. The deed conveying title to the BUYER is executed personally by the SELLER, who is record owner of the property, and not under a Power of Attorney.

11. To the extent SELLER is in possession of any oil, gas, mineral, or coal rights, such rights shall transfer to BUYER with the sale of this property, whether surface or subsurface. SELLER shall disclose same to BUYER within three (3) days of the effective date of this Agreement. SELLER shall assign any leases attached to the property or the underlying oil, gas, coal, or mineral rights to BUYER as part of this purchase. SELLER shall assign any Surface Use Agreements to BUYER as part of this Agreement. SELLER shall assist BUYER in obtaining acceptable Surface Use Agreement(s) at no additional cost to BUYER. Should BUYER be unable to obtain acceptable Surface Use Agreement(s) with any leaseholders, BUYER shall have the right to cancel this contract.

12. Seller shall have the right to market the five-acre property outlined in red to other parties, however, SELLER shall give BUYER first right of refusal for any offer received during the option period set forth in this Agreement. If Seller receives a bona fide written offer to purchase the five-acre property outlined in red from a third party, then Seller shall provide a copy of said written offer to Buyer within five (5) business days of receipt of the same and Buyer shall have ten (10) business days from the date that the third party written offer was sent to Buyer by Seller in which to exercise the Buyer's option to purchase the five acre property upon the same terms as specified in the third party written offer. If Buyer fails to exercise said option within said ten (10) business day period, then said Buyer option shall forever terminate.

[redacted]

13. SELLER shall cooperate with BUYER'S reasonable requests with respect to diligence, permitting and approvals.

14. In the event of a conflict between the Agreement and this Addendum, this Addendum shall control.

Signed, this 7th day of August 2023

Buyer:

[redacted]

Todd Hyatt, Manager
Greenpath Zion Landco LLC

Seller:

[redacted]

Name:
Title:

[redacted]

Exhibit A-1
Option Payment Schedule

[redacted]

The Parties hereby acknowledge receipt of the above Payment Schedule.

Notwithstanding anything to the contrary within this Agreement, the deposits listed in this Exhibit A-1 may be made at Buyer's sole option prior to the expiration of the time period listed herein in order to preserve the Agreement, and shall be nonrefundable upon payment to Seller. Buyer reserves the option at or before the expiration of each time period to pay the remainder of the purchase price and take title, to make the extension payment to Seller to extend the Site Diligence Period, or to void the contract with no further obligation to the Parties.
Should [redacted] Seller, this Agreement shall be void upon notice to Seller, and Buyer shall forfeit any fu

Seller: [redacted]

Seller: _____

Seller: _____

Buyer [redacted]

[redacted]

Exhibit A-2
Site Plan

BUYER is purchasing the portion of the property outlined in blue. The portion in red is excluded from this Option. Buyer to obtain a survey showing the full metes and bounds of the property.

[redacted]

APPENDIX F

Disclosure Statement

Disclosure Statement

Zion Community Energy Initiative LLC
Name and address of Officers:
Todd Fryatt, Manager
[redacted]

Name and Address of all shareholders owning interest in excess of 20% of an interest in the company:

ECA Illinois HoldCo LLC
Todd Fryatt, Manager
[redacted]

APPENDIX G

Conditional Use Permit Plans

eca solar

ZION COMMUNITY ENERGY INITIATIVE LLC

A 4.50 MW (AC) GROUND-MOUNTED SOLAR POWER GENERATING FACILITY

14280 WEST 9TH STREET (ENTRANCE OFF NORTH KILBOURNE RD)
ZION, LAKE COUNTY, ILLINOIS 60099

CONDITIONAL USE PERMIT PLANS

DEVELOPMENT TEAM

APPLICANT/CONTRACTOR
ZION COMMUNITY ENERGY INITIATIVE LLC
[redacted]
CONTACT: TIFFANY GRACE

OWNER
FRANK RYSER, SUCCESSOR TRUSTEE OF THE
ELSIE RYSER TRUST
14280 WEST 9TH STREET
LAKE COUNTY, ILLINOIS

CIVIL ENGINEER/LANDSCAPE
ARCHITECT/SURVEYOR
ATWELL, LLC
[redacted]
CONTACT: KERI WILLIAMS, P.E.

GOVERNING AGENCIES CONTACTS

MUNICIPALITY
LAKE COUNTY PLANNING, BUILDING, & DEVELOPMENT
500 W WINCHESTER ROAD, UNIT 101
LIBERTYVILLE, IL 60048
PHONE: (847) 377-2600
CONTACT: LCPERMITS@LAKECOUNTYIL.GOV

HIGHWAY
LAKE COUNTY DIVISION OF TRANSPORTATION
600 W. WINCHESTER ROAD
LIBERTYVILLE, IL 60048
PHONE: (847) 377-7400
EMAIL: HDPERMITS@LAKECOUNTYIL.GOV

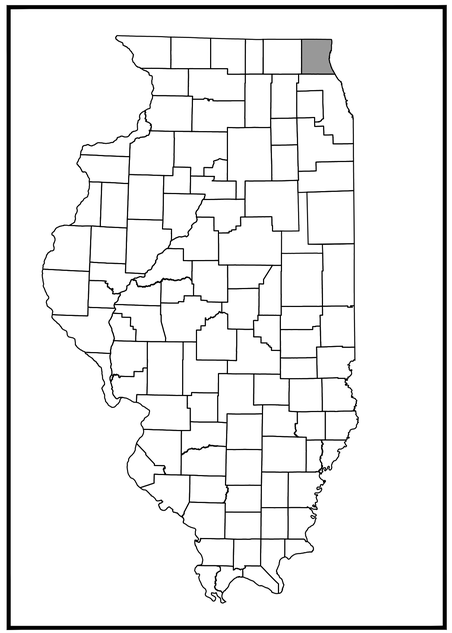
SOIL AND WATER CONSERVATION DISTRICT
MCHENRY-LAKE COUNTY SOIL & WATER CONSERVATION DISTRICT
1648 S. EASTWOOD DRIVE
WOODSTOCK, IL 60098
PHONE: (815) 338-0444 x3

9-1-1 ADDRESS

TBD N KILNOURNE RD
ZION, IL 60099
LAKE COUNTY

SHEET INDEX

C-000 COVER SHEET
C-100 EXISTING CONDITIONS & DEMOLITION PLAN
C-200 SESC PLAN
C-201 SESC NOTES AND DETAILS
C-300 SITE LAYOUT PLAN
C-400 STORMWATER PLAN
C-401 ACCESS ROAD GRADING
C-500 LANDSCAPE PLAN
C-600 DETAILS
C-700 LCDOT INTERSECTION SIGHT DISTANCE



ILLINOIS
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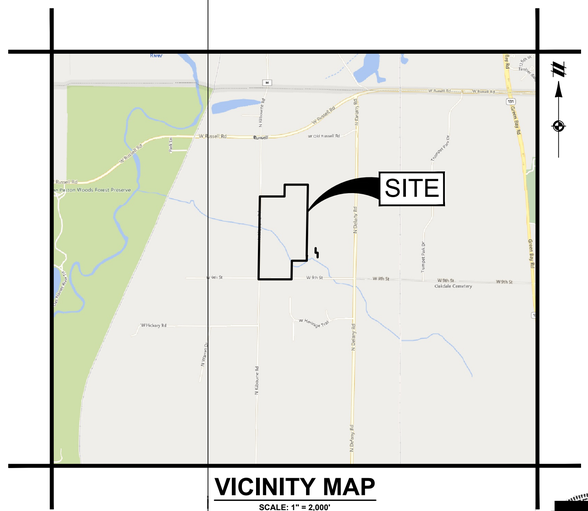
LAKE COUNTY
NOT TO SCALE



VICINITY MAP
SCALE: 1" = 2,000'

KERI L. WILLIAMS
062-058662
3/8/25
STATE OF ILLINOIS
Exp. 11/30/26

Know what's below. Call before you dig.

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

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

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ATWELL

PART OF THE NE 1/4 SECTION 11
TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
COVER SHEET

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

5/21/24
REV PER NEWPORT FPD
6/18/24
REV PER NEWPORT FPD
7/2/24
REV PER CLIENT
7/17/24
REV PER CLIENT
8/10/24
REV PER CLIENT
9/18/24
REV PER CLIENT
9/26/24
REV LAKE COUNTY
11/14/24
REV LAKE COUNTY
1/27/25
LANDSCAPE REV LAKE COUNTY
3/6/25
LANDSCAPE REV LAKE COUNTY
3/18/25
LANDSCAPE REV LAKE COUNTY

REVISIONS

SCALE
N.T.S.

DRAWN BY
J.M. K. WILLIAM

BOOK

JOB 23007919

SHEET NO.
C-000

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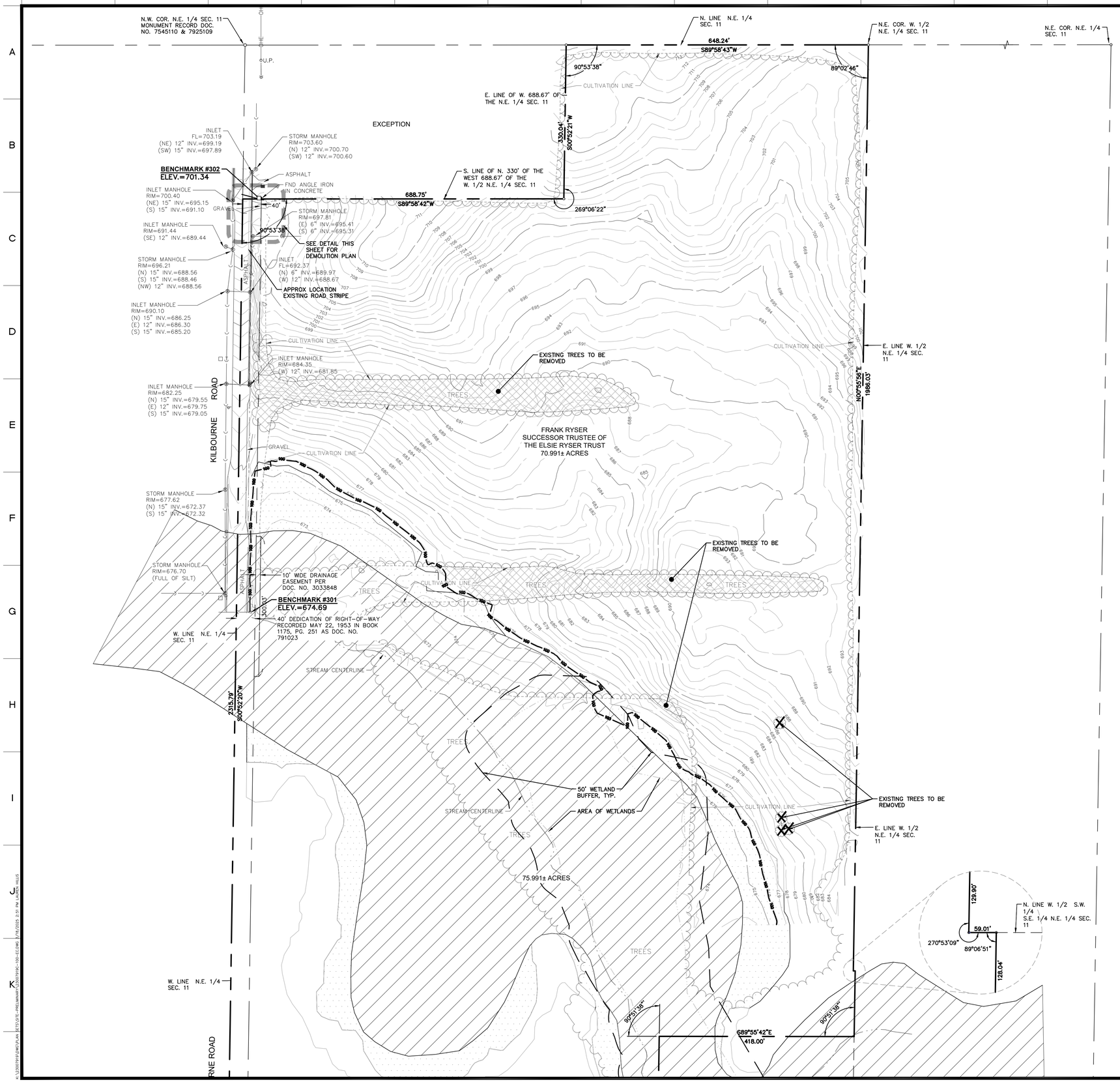


LEGEND

- BOUNDARY LINE
- EXISTING ROW
- EXISTING CONTOUR
- EXISTING OVERHEAD ELECTRIC
- EXISTING STORM SEWER
- EXISTING VEGETATION LINE
- APPROXIMATE 100-YEAR FLOOD ELEVATION = 675.90
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- EXISTING STREAM CENTERLINE
- EXISTING GUARD RAIL
- REMOVE CONCRETE CURB AND GUTTER
- FULL DEPTH SAWCUT LIMITS
- SURVEY MONUMENT
- EXISTING STORM MANHOLE
- EXISTING TELEPHONE RISER
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING MAILBOX
- EXISTING TREE
- EXISTING ASPHALT
- EXISTING BUILDING
- APPROXIMATE FLOOD ZONE AE
- APPROXIMATE FLOODWAY
- REMOVE EXISTING GRAVEL & VEGETATION
- REMOVE EXISTING TREE

EXISTING CONDITIONS BASED ON BOUNDARY SURVEY PREPARED BY FARNSWORTH GROUP, INC. DATED 11/13/2023.

THE FLOODPLAIN APPROXIMATE LOCATION IS BASED ON FEMA FLOOD MAP(S) 17097C0056K & 17097C0057K, BOTH DATED 09/18/2013. THE APPROXIMATE 100-YEAR FLOOD ELEVATION IS 675.90 FT

BENCHMARKS AND CONTROL:

COORDINATES SHOWN HEREON ARE PER ILLINOIS STATE PLANE EAST ZONE (NAD83) 2011 ADJUSTMENT, IN US SURVEY FEET. ELEVATIONS SHOWN HEREON ARE PER NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) GEOID18 (CONUS) US STATE PLANE 1983 IN US SURVEY FEET.

SOURCE BENCHMARK

BM 301: CUT CROSS IN TOP OF NORTHERN MOST FLARED END SECTION AT CREEK.
ELEVATION: 674.69

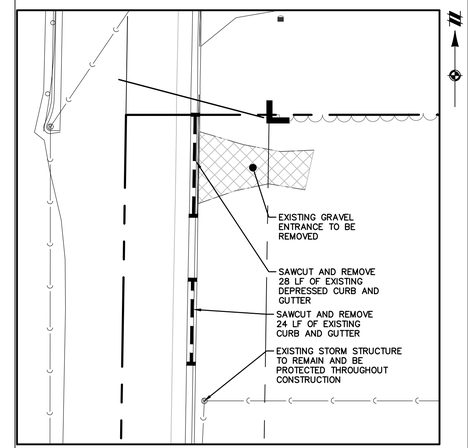
BM 302: CUT CROSS IN SOUTHEAST CORNER OF CONCRETE POST.
ELEVATION: 701.34

GENERAL NOTES

1. COMPARE ALL DISTANCES AND POINTS IN FIELD AND REPORT ANY DISCREPANCIES IN SAME TO SURVEYOR AT ONCE.
2. THE INTENDED PLOT SIZE FOR THIS SHEET IS 24"X36", RESPECTIVELY NO DIMENSIONS SHOULD BE ASSUMED BY SCALING.
3. UTILITIES SHOWN HEREON ARE BY VISIBLE LOCATION OF ABOVE GROUND STRUCTURES, MARKS IN FIELD AND PROVIDED MAPS. UNDERGROUND UTILITIES MAY EXIST THAT ARE NOT SHOWN HEREON.
4. CALL 811 ("COMMON GROUND ALLIANCE" NATIONAL UNDERGROUND UTILITY LOCATOR SERVICE) FOR FIELD LOCATION OF UNDERGROUND UTILITY LINES PRIOR TO ANY DIGGING OR CONSTRUCTION.

DEMOLITION NOTES:

1. PROTECT ALL ITEMS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL ENSURE THE INTEGRITY OF ALL ITEMS DENOTED TO BE PROTECTED THAT ARE ADJACENT TO ITEMS DENOTED TO BE DEMOLISHED AND WILL SAFELY REPAIR ANY SUCH ITEMS TO THE REQUIRED JURISDICTIONAL STANDARDS.
2. SAWCUT AND REMOVAL OF EXISTING CONCRETE/ASPHALT PAVEMENT, SIDEWALK, CURB AND GUTTER AND ASSOCIATED APPURTENANCES SHALL INCLUDE, BUT NOT BE LIMITED TO, REINFORCEMENT AND STONE BASE.
3. REMOVAL OF EXISTING ON-SITE LANDSCAPE SHALL INCLUDE STUMPS.
4. ANY ITEM NOT INDICATED AS BEING REMOVED SHALL REMAIN.
5. TREES TO BE REMOVED ARE DESIGNATED ON THIS PLAN FOR REFERENCE. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF ALL TREES AND VEGETATION NECESSARY TO ACCOMMODATE CONSTRUCTION.
6. CONTRACTOR MUST PROVIDE A BARRIER FROM PUBLIC ACCESS TO THE SITE PRIOR TO THE START OF DEMOLITION ACTIVITY AND UNTIL SITE CONSTRUCTION HAS BEEN COMPLETED.



DEMOLITION PLAN
SCALE 1" = 20'

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

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

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LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
EXISTING CONDITIONS &
DEMOLITION PLAN

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

REVISIONS
5/21/24 REV PER NEWPORT FPD
6/18/24 REV PER NEWPORT FPD
7/2/24 REV PER CLIENT
7/17/24 REV PER CLIENT
9/10/24 REV PER CLIENT
9/18/24 REV PER CLIENT
9/26/24 REV LAKE COUNTY
11/14/24 REV LAKE COUNTY
1/27/25 LANDSCAPE REV LAKE COUNTY
1/6/25 LANDSCAPE REV LAKE COUNTY
1/18/25 LANDSCAPE REV LAKE COUNTY

SCALE 0 50 100
1" = 100 FEET

DR.CMP/LEH | CH. JC
P.M. K. WILLIAMS
BOOK
JOB 23007919
SHEET NO.
C-100

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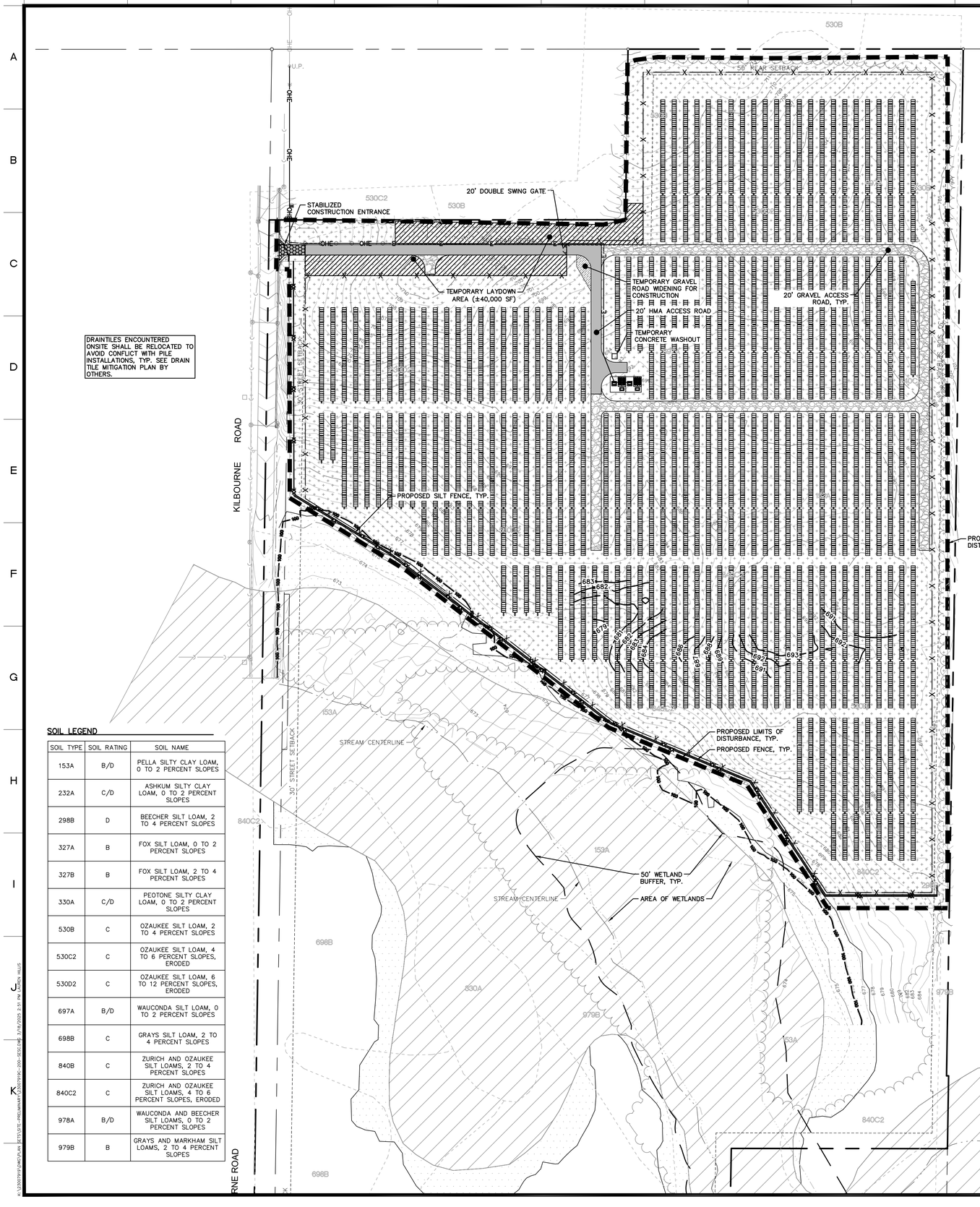

SOIL LEGEND

SOIL TYPE	SOIL RATING	SOIL NAME
153A	B/D	PELLA SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
232A	C/D	ASHKUM SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
298B	D	BEECHER SILT LOAM, 2 TO 4 PERCENT SLOPES
327A	B	FOX SILT LOAM, 0 TO 2 PERCENT SLOPES
327B	B	FOX SILT LOAM, 2 TO 4 PERCENT SLOPES
330A	C/D	PEOTONE SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES
530B	C	OZAUKEE SILT LOAM, 2 TO 4 PERCENT SLOPES
530C2	C	OZAUKEE SILT LOAM, 4 TO 6 PERCENT SLOPES, ERODED
530D2	C	OZAUKEE SILT LOAM, 6 TO 12 PERCENT SLOPES, ERODED
697A	B/D	WAUCONDA SILT LOAM, 0 TO 2 PERCENT SLOPES
698B	C	GRAYS SILT LOAM, 2 TO 4 PERCENT SLOPES
840B	C	ZURICH AND OZAUKEE SILT LOAMS, 2 TO 4 PERCENT SLOPES
840C2	C	ZURICH AND OZAUKEE SILT LOAMS, 4 TO 6 PERCENT SLOPES, ERODED
978A	B/D	WAUCONDA AND BEECHER SILT LOAMS, 0 TO 2 PERCENT SLOPES
979B	B	GRAYS AND MARKHAM SILT LOAMS, 2 TO 4 PERCENT SLOPES

LEGEND

- BOUNDARY LINE
- EXISTING ROW
- SETBACK LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING VEGETATION LINE
- APPROXIMATE LIMITS OF EXISTING SOIL TYPE
- PROPOSED SILT FENCE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- APPROXIMATE 100-YEAR FLOOD ELEVATION = 675.90
- LIMITS OF DISTURBANCE
- PROPOSED HMA ACCESS ROAD, SEE DETAIL SHEET C-600
- PROPOSED PERMANENT GRAVEL, SEE DETAIL SHEET C-600
- TEMPORARY GRAVEL ROAD WIDENING FOR CONSTRUCTION
- APPROXIMATE FLOOD ZONE AE
- APPROXIMATE FLOODWAY
- TEMPORARY CONSTRUCTION ENTRANCE
- TEMPORARY STABILIZATION/SEEDING

EXISTING CONDITIONS BASED ON BOUNDARY SURVEY PREPARED BY FARNSWORTH GROUP, INC. DATED 11/13/2023.

THE FLOODPLAIN APPROXIMATE LOCATION IS BASED ON FEMA FLOOD MAP(S) 17097C0056K & 17097C0057K, BOTH DATED 09/18/2013. THE APPROXIMATE 100-YEAR FLOOD ELEVATION IS 675.90 FT

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION SOIL EROSION AND SEDIMENT CONTROL CONSTRUCTION NOTES

A. SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF HYDROLOGIC DISTURBANCE OF UPLAND AREAS.

B. FOR THE DEVELOPMENTS THAT REQUIRE A DESIGNATED EROSION CONTROL INSPECTOR (DECI), INSPECTIONS AND DOCUMENTATION SHALL BE PREFORMED, AT A MINIMUM:

- UPON COMPLETION OF SEDIMENT AND RUNOFF CONTROL MEASURES (INCLUDING PERIMETER CONTROLS AND DIVERSIONS) PRIOR TO PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING.
- AFTER EVERY (7) CALENDAR DAYS OR STORM EVENTS WITH GREATER THAN 0.5 INCH OF RAINFALL OR LIQUID EQUIVALENT PRECIPITATION.

C. SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER AS TO MINIMIZE EROSION. IF STRIPPING, CLEARING, GRADING, OR LANDSCAPING ARE TO BE DONE IN PHASES, THE PERMITTEE SHALL PLAN FOR APPROPRIATE SOIL EROSION AND SEDIMENT CONTROL MEASURES.

D. A STABILIZED MAT OF CRUSHED STONE MEETING IDOT GRADATION CA-1 UNDERLAIN WITH FILTER FABRIC AND IN ACCORDANCE WITH ILLINOIS URBAN MANUAL, OR OTHER APPROPRIATE MEASURES) AS APPROVED BY THE ENFORCEMENT OFFICER, SHALL BE INSTALLED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE. SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT-OF-WAY, STREET, ALLEY OR PARKING AREA SHALL BE REMOVED BY SCAPING OR SOIL REACHING AN IMPROVED PUBLIC RIGHT-OF-WAY, STREET, ALLEY OR PARKING AREA SHALL BE REMOVED BY SCRAPING OR STREET CLEANING AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.

E. TEMPORARY DIVERSIONS SHALL BE CONSTRUCTED AS NECESSARY TO DIRECT ALL RUNOFF FROM HYDROLOGICALLY DISTURBED AREAS TO AN APPROPRIATE SEDIMENT TRAP OR BASIN.

F. DISTURBED AREAS SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT MEASURES WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE END OF ACTIVE HYDROLOGIC DISTURBANCE OR REDISTURBANCE.

G. ALL STOCKPILES SHALL HAVE APPROPRIATE MEASURES TO PREVENT EROSION. STOCKPILES SHALL NOT BE PLACE IN FLOOD PRONE AREAS OR WETLANDS AND DESIGNATED BUFFERS.

H. SLOPES STEEPER THAN 3H:1V SHALL BE STABILIZED WITH APPROPRIATE MEASURES AS APPROVED BY THE ENFORCEMENT OFFICER.

I. APPROPRIATE EROSION CONTROL BLANKET SHALL BE INSTALLED ON ALL INTERIOR DETENTION BASIN SIDE SLOPES BETWEEN THE NORMAL WATER LEVEL AND HIGH-WATER LEVEL.

J. STORM SEWERS THAT ARE OR WILL BE FUNCTIONING DURING CONSTRUCTION SHALL BE PROTECTED BY AN APPROPRIATE SEDIMENT CONTROL MEASURE.

K. IF DEWATERING SERVICES ARE USED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. DISCHARGES SHALL BE ROUTED THROUGH AN APPROVED AN IONIC POLYMER DEWATERING SYSTEM OR A SIMILAR MEASURE AS APPROVED BY THE ENFORCEMENT OFFICER. DEWATERING SYSTEMS SHOULD BE INSPECTED DAILY DURING OPERATIONAL PERIODS. THE ENFORCEMENT OFFICER, OR APPROVED REPRESENTATIVE, MUST BE PRESENT AT THE COMMENCEMENT OF DEWATERING ACTIVITIES.

L. IF INSTALLED SOIL EROSION AND SEDIMENT CONTROL MEASURES DO NOT MINIMIZE SEDIMENT LEAVING THE DEVELOPMENT SITE, ADDITIONAL MEASURES SUCH AS AN IONIC POLYMERS OR FILTRATION SYSTEMS MAY NE REQUIRED BY THE ENFORCEMENT OFFICER,

M. ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES MUST BE MAINTAINED AND REPAIRED AS NEEDED. THE PROPERTY OWNER SHALL BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE AND REPAIR.

N. ALL TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED.

O. THE EROSION CONTROL MEASURE INDICATED ON THE PLANS ARE THE MINIMUM REQUIREMENT. ADDITIONAL MEASURES MAY BY REQUIRED, AS DIRECTED BY THE ENGINEER, ENFORCEMENT OFFICER, OR OTHER GOVERNING AGENCY.

EROSION CONTROL AND SEDIMENTATION NOTES:

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

CONSTRUCTION SEQUENCE:

1. INSTALLATION OF SOIL EROSION AND SEDIMENT CONTROL SE/SC MEASURES
   - A. SELECTIVE VEGETATIVE REMOVAL FOR SILT FENCE INSTALLATION
   - B. SILT FENCE INSTALLATION
   - C. CONSTRUCTION FENCING AROUND AREAS NOT TO BE DISTURBED
   - D. INSTALL PROPOSED CULVERT AND INLET PROTECTION.
   - E. INSTALL ACCESS ROAD AT ITS FULL WIDTH WITH THE STABILIZATION CONSTRUCTION ENTRANCE UNDER THE EGRESS LAND TO ENSURE EGRESS TRUCKS ARE PROPERLY CLEANED OF MUD AND DEBRIS PRIOR TO ENTERING THE PUBLIC ROADS.
2. TREE REMOVAL WHERE NECESSARY (CLEAR & GRUB)
3. CONTAIN STOCKPILE LOCATIONS WITHIN SITE AND INSTALL EROSION CONTROL MEASURES AS NECESSARY.
4. INSTALL GRAVEL ACCESS DRIVE. ACCESS DRIVE SHALL BE INSTALLED WITHIN THE RIGHT-OF-WAY PRIOR TO SITE CONSTRUCTION.
5. START CONSTRUCTION OF SOLAR PANELS AND UTILITIES.
6. INITIATE TEMPORARY SEEDING WITHIN ONE BUSINESS DAY OF INACTIVITY, THROUGHOUT CONSTRUCTION, DENUDED AREAS THAT WILL BE INACTIVE FOR 14 DAYS OR MORE.
7. REMOVE GRAVEL FOR LAYDOWN AREA, AND SPREAD WITH TOPSOIL. GRAVEL SHALL BE USED TO FILL IN AREAS ON ACCESS ROAD THAT WERE DAMAGED OR RUTTED DURING CONSTRUCTION. ALL TEMPORARY LAY DOWN AREAS WILL BE REMOVED AT THE END OF CONSTRUCTION. AREAS WILL BE RESTORED, RESEEDED AND MAINTAINED PURSUANT TO THE SITE OPERATION AND MAINTENANCE PLAN. THE AREA WILL BE DECOMPACTED NO LESS THAN 6 INCHES AND SEEDED WITH THE SITE'S NATIVE POLLINATOR SEED MIX
8. PERMANENTLY STABILIZE ALL AREAS. SEE LANDSCAPE PLAN FOR PERMANENT STABILIZATION MIXES.
9. REMOVE ALL TEMPORARY SE/SC MEASURES AFTER THE SITE IS STABILIZED WITH VEGETATION.
   - SOIL EROSION AND SEDIMENT CONTROL MAINTENANCE MUST OCCUR EVERY TWO WEEKS AND AFTER EVERY ½ OF GREATER RAINFALL EVENT.

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

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

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ATWELL

PART OF THE NE 1/4 SECTION 11
TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC
14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
SESC PLAN

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

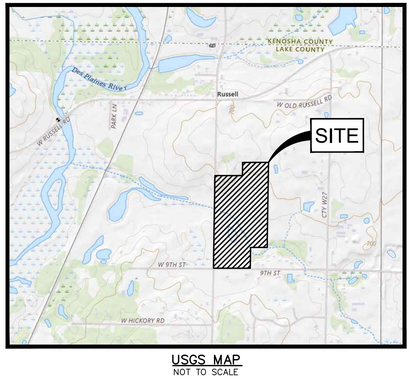
REVISIONS
5/21/24 REV PER NEWPORT FPD
6/28/24 REV PER NEWPORT FPD
7/2/24 REV PER CLIENT
7/17/24 REV PER CLIENT
9/10/24 REV PER CLIENT
9/18/24 REV PER CLIENT
9/26/24 REV LAKE COUNTY
11/14/24 REV LAKE COUNTY
1/27/25 LANDSCAPE REV LAKE COUNTY
3/6/25 LANDSCAPE REV LAKE COUNTY
3/18/25 LANDSCAPE REV LAKE COUNTY

SCALE 0 50 100
1" = 100 FEET
DR.CMP/LEH | CH. JC
P.M. K. WILLIAMS
BOOK
JOB 23007919
SHEET NO. C-200

CAD FILE: 23007919C-200-SESC.DWG

SOIL EROSION AND SEDIMENTATION CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED IN ACCORDANCE WITH THE CONDITIONS OF APPLICABLE IL GENERAL NPDES PERMIT.
2. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED AND REPLACED AS NECESSARY AT NO ADDITIONAL COST TO THE OWNER.
3. THE EROSION CONTROL MEASURES INCLUDED IN THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE INSTALLED PRIOR TO INITIAL LAND DISTURBANCE ACTIVITIES OR AS SOON AS PRACTICAL. SEDIMENT SHALL BE PREVENTED FROM DISCHARGING FROM THE PROJECT SITE BY INSTALLING AND MAINTAINING SILT FENCE, STRAW BALES, SEDIMENT BASINS, ETC. AS SHOWN ON THIS PLAN. IF SHOWN ON THESE PLANS, ENERGY-DISSIPATION DEVICES OR EROSION CONTROL AT THE OUTFALL OF THE STORM SEWER SYSTEM SHALL BE INSTALLED AT THE TIME OF THE CONSTRUCTION OF THE OUTFALL.
4. THE CONTRACTOR SHALL CONTROL WASTES, GARBAGE, DEBRIS, WASTEWATER, AND OTHER SUBSTANCES ON THE SITE IN SUCH A WAY THAT THEY SHALL NOT BE TRANSPORTED FROM THE SITE BY THE ACTION OF WINDS, STORM WATER RUNOFF, OR OTHER FORCES. PROPER DISPOSAL OR MANAGEMENT OF ALL WASTES AND UNUSED BUILDING MATERIAL, APPROPRIATE TO THE NATURE OF THE WASTE OR MATERIAL IS REQUIRED. COMPLIANCE IS REQUIRED WITH ALL STATE OR LOCAL REGULATIONS REGARDING WASTE DISPOSAL, SANITARY SEWER, OR SEPTIC SYSTEMS.
5. PUBLIC OR PRIVATE ROADWAYS SHALL BE KEPT CLEARED OF ACCUMULATED SEDIMENT. IF SEDIMENT HAS BEEN TRACKED-OUT FROM THE SITE ONTO PAVED ROADS, SIDEWALKS, OR OTHER PAVED AREAS OUTSIDE THE SITE, REMOVE THE DEPOSITED SEDIMENT BY THE END OF THE SAME BUSINESS DAY IN WHICH THE TRACK-OUT OCCURS OR BY THE END OF THE NEXT BUSINESS DAY IF TRACK-OUT OCCURS ON A NON-BUSINESS DAY. REMOVE TRACK-OUT BY SWEEPING, SHOVELING, OR VACUUMING THESE SURFACES, OR BY USING OTHER SIMILAR EFFECTIVE MEANS OF SEDIMENT REMOVAL. THE HOSING OR SWEEPING OF TRACKED-OUT SEDIMENT INTO ANY STORMWATER CONVEYANCE, STORM DRAIN INLET, OR WATER OF THE US IS PROHIBITED. CLEARED SEDIMENT SHALL BE RETURNED TO THE POINT OF LIKELY ORIGIN OR OTHER SUITABLE LOCATION.
6. ALL DISCHARGES FROM DEWATERING ACTIVITIES, INCLUDING DISCHARGES FROM DEWATERING OF TRENCHES AND EXCAVATIONS, SHALL BE MANAGED BY APPROPRIATE CONTROLS.
   - DEWATERING DISCHARGED SHALL BE TREATED OR CONTROLLED TO MINIMIZE DISCHARGES OF POLLUTANTS.
   - THE DISCHARGE SHALL NOT INCLUDE VISIBLE FLOATING SOLIDS OR FOAM.
   - AN OIL-WATER SEPARATOR OR SUITABLE FILTRATION DEVICE SHALL BE USED TO TREAT OIL, GREASE, OR OTHER SIMILAR PRODUCTS IF DEWATERING IS FOUND TO CONTAIN THESE MATERIALS.
   - TO THE EXTENT FEASIBLE, USE VEGETATED, UPLAND AREAS OF THE SITE TO INFILTRATE DEWATERING WATER BEFORE DISCHARGE.
   - BACKWASH WATER (WATER USED TO BACKWASH/CLEAN ANY FILTERS USED AS PART OF THE STORMWATER TREATMENT) MUST BE PROPERLY TREATED OR HAULED OFF-SITE FOR DISPOSAL.
   - DEWATERING TREATMENT DEVICES SHALL BE PROPERLY MAINTAINED.
7. GENERAL CONTRACTOR SHALL DENOTE ON PLAN THE TEMPORARY PARKING AND STORAGE AREA WHICH SHALL ALSO BE USED AS THE EQUIPMENT MAINTENANCE AND CLEANING AREA, EMPLOYEE PARKING AREA, AND AREA FOR LOCATING PORTABLE FACILITIES, OFFICE TRAILERS, AND TOILET FACILITIES.
8. ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED OR DISPOSED.
9. SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
10. DUST ON THE SITE SHALL BE CONTROLLED. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
11. ALL ON-SITE STORM DRAIN INLETS SHALL BE PROTECTED AGAINST SEDIMENTATION WITH STRAW BALES, FILTER FABRIC, OR EQUIVALENT BARRIERS AS SHOWN ON THESE PLANS.
12. EXCEPT AS PREVENTED BY INCLEMENT WEATHER CONDITIONS, STABILIZATION OF DISTURBED AREAS MUST BE INITIATED WITHIN ONE (1) WORKING DAY OF PERMANENT OR TEMPORARY CESSATION OF EARTH DISTURBING ACTIVITIES AND SHALL BE COMPLETED AS SOON AS POSSIBLE, BUT NO LATER THAN 14 DAYS FROM THE INITIATION OF THE STABILIZATION WORK IN AN AREA.
13. THIS EROSION CONTROL PLAN SHALL BE IMPLEMENTED ON ALL DISTURBED AREAS WITHIN THE CONSTRUCTION SITE. ALL MEASURES INVOLVING EROSION CONTROL PRACTICES SHALL BE INSTALLED UNDER THE GUIDANCE OF QUALIFIED PERSONNEL EXPERIENCED IN EROSION CONTROL, AND FOLLOWING THE PLANS AND SPECIFICATIONS INCLUDED HEREIN.
14. ALL DISTURBED AREAS, AREAS USED FOR STORAGE OR MATERIALS THAT ARE EXPOSED TO PRECIPITATION, AND ALL AREAS WHERE STORMWATER TYPICALLY FLOWS WITHIN THE SITE SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN SHALL BE OBSERVED TO ENSURE THAT THEY ARE STILL STABILIZED. WHERE DISCHARGE LOCATIONS OR POINTS ARE ACCESSIBLE, THEY SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO RECEIVING WATERS. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF SITE SEDIMENT TRACKING.
15. CONTRACTOR SHALL TAKE CORRECTIVE ACTIONS TO ADDRESS ANY STORMWATER CONTROL THAT NEEDS REPAIR OR REPLACEMENT AS SOON AS POSSIBLE AND DOCUMENT CORRECTIVE ACTIONS WITHIN SEVEN DAYS IN AN INSPECTION REPORT.
16. CONTRACTOR SHALL INSTALL EROSION CONTROL BLANKET PER MANUFACTURER'S RECOMMENDATIONS ON ALL SLOPES 4:1 OR STEEPER.
17. DURING THE PERIOD OF CONSTRUCTION ACTIVITY, ALL SEDIMENT BASINS AND OTHER EROSION CONTROL MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR. AT COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE THE TRANSFER OF MAINTENANCE RESPONSIBILITIES, IF REQUIRED, WITH THE OWNER. MAINTENANCE SHALL BE IN ACCORDANCE WITH THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, 1987, AND THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN.
18. ON-SITE & OFFSITE SOIL STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION THROUGH IMPLEMENTATION OF BEST MANAGEMENT PRACTICES (I.E. SILT FENCE, TEMPORARY STABILIZATION, ETC.). STOCKPILE AND BORROW AREA LOCATIONS SHALL BE NOTED ON THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS.
19. EXISTING VEGETATION SHALL BE PROTECTED AS MUCH AS PRACTICAL.
20. ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE REMOVED AND DISPOSED OF WITHIN THIRTY DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY PRACTICES ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION.
21. CONTRACTOR SHALL REMOVE ANY ACCUMULATED SEDIMENT FROM DETENTION BASINS AND STORM SEWER SYSTEMS IN CONJUNCTION WITH THE FINAL STABILIZATION OF THE SITE.
22. THIS EROSION CONTROL PLAN MUST BE RETAINED ON-SITE AT ALL TIMES DURING THE PERIOD OF CONSTRUCTION.



USGS MAP
NOT TO SCALE
RECEIVING WATER: STERLING LAKE-DES PLAINES RIVER

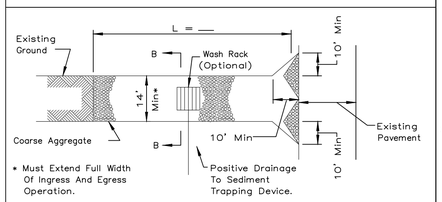
CONCRETE WASHOUT

INSTALLATION
PREFABRICATED WASHOUT SYSTEMS/CONTAINERS
1. INSTALL AND LOCATE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

DESIGNED AND INSTALLED SYSTEMS
1. UTILIZE AND FOLLOW THE DESIGN IN THE STORM WATER POLLUTION PREVENTION PLAN TO INSTALL THE SYSTEM.
2. DEPENDENT UPON THE TYPE OF SYSTEM, EITHER EXCAVATE THE PIT OR INSTALL THE CONTAINMENT SYSTEM.
3. A BASE SHALL BE CONSTRUCTED AND PREPARED THAT IS FREE OF ROCKS AND OTHER DEBRIS THAT MAY CAUSE TEARS OR PUNCTURES IN THE POLYETHYLENE LINING.
4. INSTALL THE POLYETHYLENE LINING. FOR EXCAVATED SYSTEMS, THE LINING SHOULD EXTEND OVER THE ENTIRE EXCAVATION. THE LINING FOR BERMED SYSTEMS SHOULD BE INSTALLED OVER THE POOLING AREA WITH ENOUGH MATERIAL TO EXTEND THE LINING OVER THE BERM OR CONTAINMENT SYSTEM. THE LINING SHOULD BE SECURED WITH PINS, STAPLES, OR OTHER FASTENERS.
5. PLACE FLAGS, SAFETY FENCING, OR EQUIVALENT TO PROVIDE A BARRIER TO CONSTRUCTION EQUIPMENT AND OTHER TRAFFIC.
6. PLACE A NON-COLLAPSING, NON-WATER HOLDING COVER OVER THE WASHOUT FACILITY PRIOR TO A PREDICTED RAINFALL EVENT TO PREVENT ACCUMULATION OF WATER AND POSSIBLE OVERFLOW OF THE SYSTEM (OPTIONAL).
7. INSTALL SIGNAGE THAT IDENTIFIES CONCRETE WASHOUT AREAS.
8. POST SIGNS DIRECTING CONTRACTORS AND SUPPLIERS TO DESIGNATED LOCATIONS.
9. WHERE NECESSARY, PROVIDE STABLE INGRESS AND EGRESS (SEE TEMPORARY CONSTRUCTION INGRESS/EGRESS PAD) OR ALTERNATIVE APPROACH PAD FOR CONCRETE WASHOUT SYSTEMS.

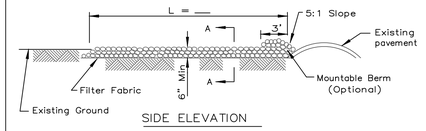
MAINTENANCE
1. INSPECT DAILY AND AFTER EACH STORM EVENT.
2. INSPECT THE INTEGRITY OF THE OVERALL STRUCTURE INCLUDING, WHERE APPLICABLE, THE CONTAINMENT SYSTEM.
3. INSPECT THE SYSTEM FOR LEAKS, SPILLS, AND TRACKING OF SOIL BY EQUIPMENT.
4. INSPECT THE POLYETHYLENE LINING FOR FAILURE, INCLUDING TEARS AND PUNCTURES.
5. ONCE CONCRETE WASTES HARDEN, REMOVE AND DISPOSE OF THE MATERIAL.
6. EXCESS CONCRETE SHOULD BE REMOVED WHEN THE WASHOUT SYSTEM REACHES 50 PERCENT OF THE DESIGN CAPACITY. USE OF THE SYSTEM SHOULD BE DISCONTINUED UNTIL APPROPRIATE MEASURES CAN BE INITIATED TO CLEAN THE STRUCTURE. PREFABRICATED SYSTEMS SHOULD ALSO UTILIZE THIS CRITERION, UNLESS THE MANUFACTURER HAS ALTERNATE SPECIFICATIONS.
7. UPON REMOVAL OF THE SOLIDS, INSPECT THE STRUCTURE. REPAIR THE STRUCTURE AS NEEDED OR CONSTRUCT A NEW SYSTEM.
8. DISPOSE OF ALL CONCRETE IN A LEGAL MANNER. REUSE THE MATERIAL ON SITE, RECYCLE, OR HAUL THE MATERIAL TO AN APPROVED CONSTRUCTION/DEMOLITION LANDFILL SITE. RECYCLING OF MATERIAL IS ENCOURAGED. THE WASTE MATERIAL CAN BE USED FOR MULTIPLE APPLICATIONS INCLUDING BUT NOT LIMITED TO ROADBEDS AND BUILDING. THE AVAILABILITY FOR RECYCLING SHOULD BE CHECKED LOCALLY.
9. THE PLASTIC LINER SHOULD BE REPLACED AFTER EVERY CLEANING; THE REMOVAL OF MATERIAL WILL USUALLY DAMAGE THE LINING.
10. THE CONCRETE WASHOUT SYSTEM SHOULD BE REPAIRED OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE.
11. CONCRETE WASHOUT SYSTEMS ARE DESIGNED TO PROMOTE EVAPORATION. HOWEVER, IF THE LIQUIDS DO NOT EVAPORATE AND THE SYSTEM IS NEAR CAPACITY IT MAY BE NECESSARY TO VACUUM OR REMOVE THE LIQUIDS AND DISPOSE OF THEM IN AN ACCEPTABLE METHOD. DISPOSAL MAY BE ALLOWED AT THE LOCAL SANITARY SEWER AUTHORITY PROVIDED THEIR NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITS ALLOW FOR ACCEPTANCE OF THIS MATERIAL. ANOTHER OPTION WOULD BE TO UTILIZE A SECONDARY CONTAINMENT SYSTEM OR BASIN FOR FURTHER DEWATERING.
12. PREFABRICATED UNITS ARE OFTEN PUMPED AND THE COMPANY SUPPLYING THE UNIT PROVIDES THIS SERVICE.
13. INSPECT CONSTRUCTION ACTIVITIES ON A REGULAR BASIS TO ENSURE SUPPLIERS, CONTRACTORS, AND OTHERS ARE UTILIZING DESIGNATED WASHOUT AREAS. IF CONCRETE WASTE IS BEING DISPOSED OF IMPROPERLY, IDENTIFY THE VIOLATORS AND TAKE APPROPRIATE ACTION.
14. WHEN CONCRETE WASHOUT SYSTEMS ARE NO LONGER REQUIRED, THE CONCRETE WASHOUT SYSTEMS SHALL BE CLOSED. DISPOSE OF ALL HARDENED CONCRETE AND OTHER MATERIALS USED TO CONSTRUCT THE SYSTEM.
15. HOLES, DEPRESSIONS AND OTHER LAND DISTURBANCES ASSOCIATED WITH THE SYSTEM SHOULD BE BACKFILLED, GRADED, AND STABILIZED.

STABILIZED CONSTRUCTION ENTRANCE PLAN



* Must Extend Full Width Of Ingress And Egress Operation.

PLAN VIEW



SIDE ELEVATION

NOTES:
1. Filter fabric shall meet the requirements of material specification 592 GEOTEXTILE, Table I or 2, Class I, II or IV and shall be placed over the cleared area prior to the placing of rock.
2. Rock or reclaimed concrete shall meet one of the following IDOT coarse aggregate gradation, CA-1, CA-2, CA-3 or CA-4 and be placed according to construction specification 25 ROCKFILL using placement Method 1 and Class III compaction.
3. Any drainage facilities required because of washing shall be constructed according to manufacturers specifications.
4. If wash racks are used they shall be installed according to the manufacturer's specifications.

REFERENCE		NRCS Natural Resources Conservation Service	STANDARD DWG. NO.
Project			IL-630
Designed	Date		SHEET 1 OF 2
Checked	Date		DATE 8-18-94
Approved	Date		

MAINTENANCE:
1. INSPECT DAILY.
2. RESHAPE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.
3. TOP DRESS WITH CLEAN AGGREGATE AS NEEDED.
4. IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS.
5. FLUSHING SHOULD ONLY BE USED IF THE WATER CAN BE CONVEYED INTO A SEDIMENT TRAP OR BASIN.

CONTRACTOR CERTIFICATION

I CERTIFY UNDER PENALTY OF LAW THAT I UNDERSTAND THE TERMS AND CONDITIONS OF THE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT (ILR10) THAT AUTHORIZES THE STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY FROM CONSTRUCTION SITE IDENITIFIED AS PART OF THIS CERITIFICATION.

GENERAL CONTRACTOR NAME _____

GENERAL CONTRACTOR ADDRESS _____

GENERAL CONTRACTOR TELEPHONE _____

GENERAL CONTRACTOR SIGNATURE _____

DATE _____

SITE ADDRESS _____

SUBCONTRACTOR NAME _____

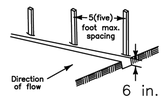
SUBCONTRACTOR ADDRESS _____

SUBCONTRACTOR TELEPHONE _____

SUBCONTRACTOR SIGNATURE _____

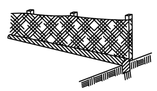
DATE _____

1. Set posts and excavate or silt-trench a 6-inch deep trench upslope along the line of the post



2. Attach the geotextile filter fabric to each post with a minimum of 3 (three) fasteners per post and extend to the bottom of the trench. Acceptable fasteners include staples, zip ties, or wire ties

3. Backfill and compact the excavated spoil materials



Geotextile Requirement	Test Method	MARV
Grab strength - Machine direction - X-machine direction	ASTM D 4632	550 N 460 N
Permittivity	ASTM D 4491	0.05 sec-1
Apparent opening size*	ASTM D 4751	0.60 mm
Ultraviolet stability (retained strength)	ASTM D 4355	70% after 500 hours

Note:
Value for apparent opening size represents maximum average roll value.

SILT FENCE DETAIL

DATE: 4/21/08 BY: KAW
REVISED: BY:

MAINTENANCE:

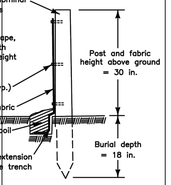
SILT FENCE SHALL BE REMOVED ONCE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

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

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

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

2 (two) inch nominal hardwood posts
or
U,T,L, or C shape, steel posts with a minimum weight of 1.33 lbs/ft



LAKE COUNTY
STORMWATER MANAGEMENT COMMISSION

811
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ATWELL

PART OF THE NE 1/4 SECTION 11
TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC
14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
SESC NOTES AND DETAILS

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

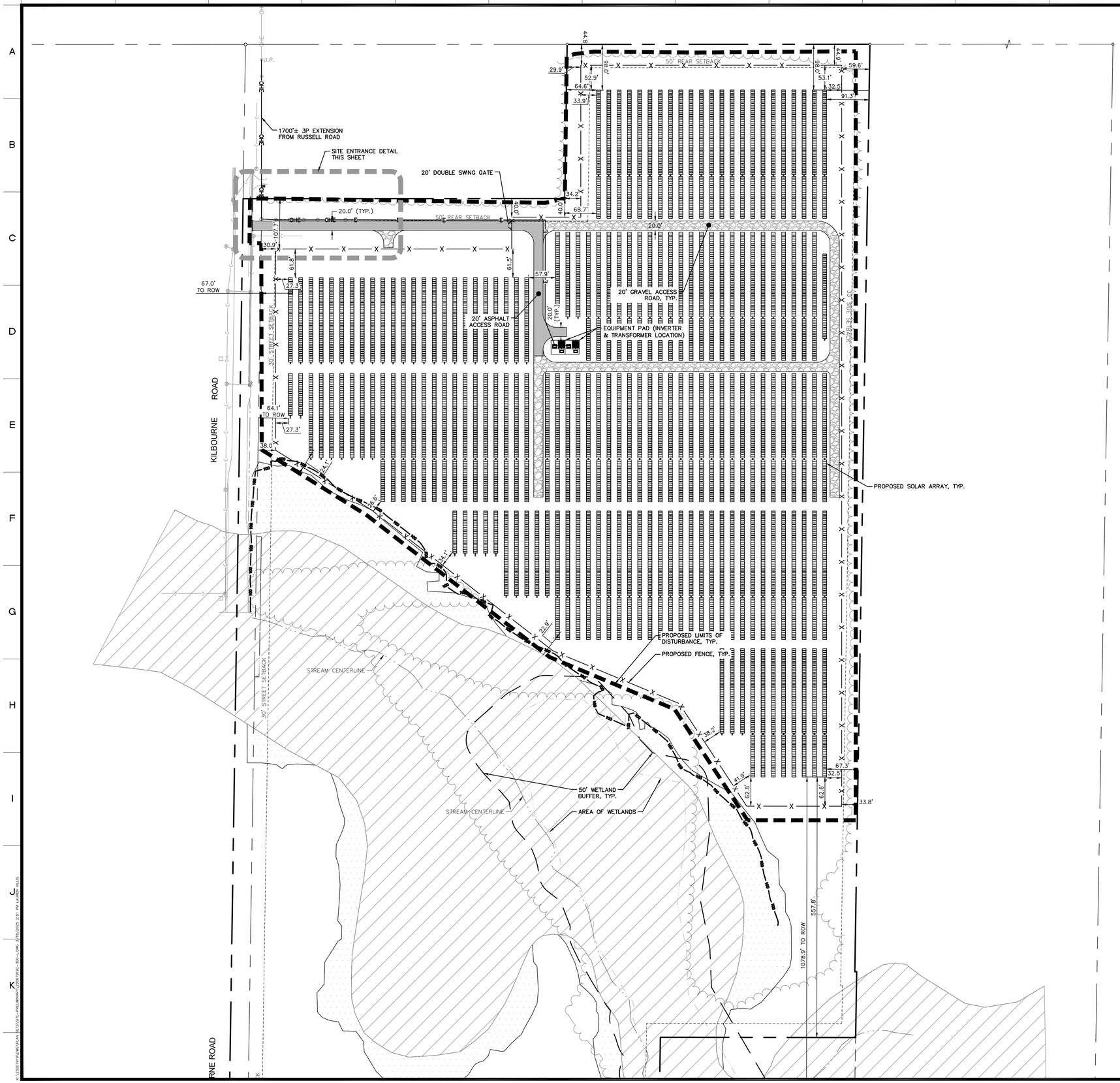
5/21/24 REV PER NEWPORT FPD
6/18/24 REV PER NEWPORT FPD
7/2/24 REV PER CLIENT
7/17/24 REV PER CLIENT
9/10/24 REV PER CLIENT
9/18/24 REV PER CLIENT
9/26/24 REV LAKE COUNTY
11/14/24 REV LAKE COUNTY
1/27/25 LANDSCAPE REV LAKE COUNTY
3/6/25 LANDSCAPE REV LAKE COUNTY
3/18/25 LANDSCAPE REV LAKE COUNTY

REVISIONS

SCALE
N.T.S.
DR. CMP/LEH | CH. JC
P.M. K. WILLIAMS
BOOK
JOB 23007919
SHEET NO.
C-201

CAD FILE: 23007919C-201-SE-DTDWG

K:\23007919\CAD\PLAN SETS\SE-PRELIMINARY\23007919C-201-SE-DTDWG 4/16/2024 2:50 PM LAUREN HILLS



LEGEND

- BOUNDARY LINE
- EXISTING ROW
- SETBACK LINE
- EXISTING STORM SEWER
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING VEGETATION LINE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- APPROXIMATE 100-YEAR FLOOD ELEVATION = 675.90
- LIMITS OF DISTURBANCE
- PROPOSED HMA ACCESS ROAD (0.45 AC), SEE DETAIL SHEET C-600
- PROPOSED PERMANENT GRAVEL (1.01 AC), SEE DETAIL SHEET C-600
- APPROXIMATE FLOOD ZONE AE
- APPROXIMATE FLOODWAY

EXISTING CONDITIONS BASED ON BOUNDARY SURVEY PREPARED BY FARNSWORTH GROUP, INC. DATED 11/13/2023.

THE FLOODPLAIN APPROXIMATE LOCATION IS BASED ON FEMA FLOOD MAP(S) 17097C0056K & 17097C0057K, BOTH DATED 09/18/2013. THE APPROXIMATE 100-YEAR FLOOD ELEVATION IS 675.90 FT

SITE DATA

PIN:	0311200013 AND 0311200014
JURISDICTION:	NEWPORT TOWNSHIP, LAKE COUNTY
ZONING DISTRICT:	A-1 (AGRICULTURAL DISTRICT)
CURRENT LAND USE:	FARM LAND
PARCEL AREA:	± 70.99 ACRES
LIMITS OF DISTURBANCE:	± 32.85 ACRES
FENCED AREA:	± 28.8 ACRES
PROPOSED IMPERVIOUS AREA:	± 1.49 ACRES
IMPERVIOUS AREA RATIO:	± 0.02

SITE CAPACITY CALCULATIONS:

BASE SITE AREA:
GROSS - ROADS/EASEMENT
70.99 AC. - 2.13 AC (ROW) = **68.86± ACRES**

NET SITE AREA:
BASE SITE AREA - FLOODPLAINS/WETLANDS/LINEAR WATER BODY
68.86 AC. - 25.69 AC. = **43.17± ACRES**

MAXIMUM IMPERVIOUS AREA SURFACE AREA:
NET SITE AREA * ZONING DISTRICT MAX ISR
43.17 AC. * 0.10 = **4.32**

SOLAR ZONING SETBACKS	REQUIRED	PROPOSED
FRONT/STREET (SOUTH):	30'	1127.3' FROM R.O.W.
SIDE/STREET (WEST):	30'	64.1' FROM R.O.W.
SIDE (EAST):	50'	67.3'
REAR (NORTH):	50'	98.0'

SETBACK REQUIREMENTS ARE FOR SOLAR PANELS AND EQUIPMENT PADS. LANDSCAPING AND FENCES ARE PERMITTED WITHIN SETBACKS.

HEIGHT RESTRICTIONS: TWENTY (20) FEET HEIGHT.

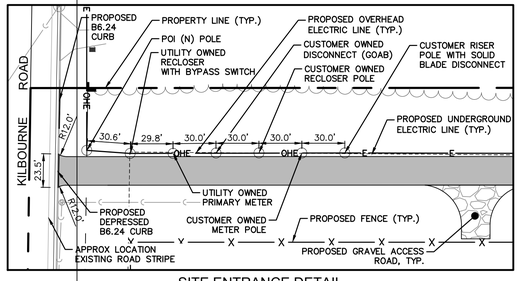
GENERAL NOTES

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

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

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

NOTE: UTILITY EQUIPMENT AND POLE LOCATIONS SUBJECT TO CHANGE UPON UTILITY REVIEW.



SITE ENTRANCE DETAIL
SCALE: 1" = 50'

Know what's below. Call before you dig.

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

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

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ATWELL

PART OF THE NE 1/4 SECTION 11
TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
SITE LAYOUT PLAN

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

5/21/24 REV PER NEWPORT FPD
6/18/24 REV PER NEWPORT FPD
7/2/24 REV PER CLIENT
7/17/24 REV PER CLIENT
9/10/24 REV PER CLIENT
9/18/24 REV PER CLIENT
9/26/24 REV LAKE COUNTY
11/14/24 REV LAKE COUNTY
1/27/25 LANDSCAPE REV LAKE COUNTY
3/6/25 LANDSCAPE REV LAKE COUNTY
3/18/25 LANDSCAPE REV LAKE COUNTY

REVISIONS

SCALE 0 50 100
1" = 100 FEET

DR. CMP/LEH	CH. JC
P.M. K. WILLIAMS	
BOOK	
JOB	23007919
SHEET NO.	C-300

CAD FILE: 23007919C-300-LDWG

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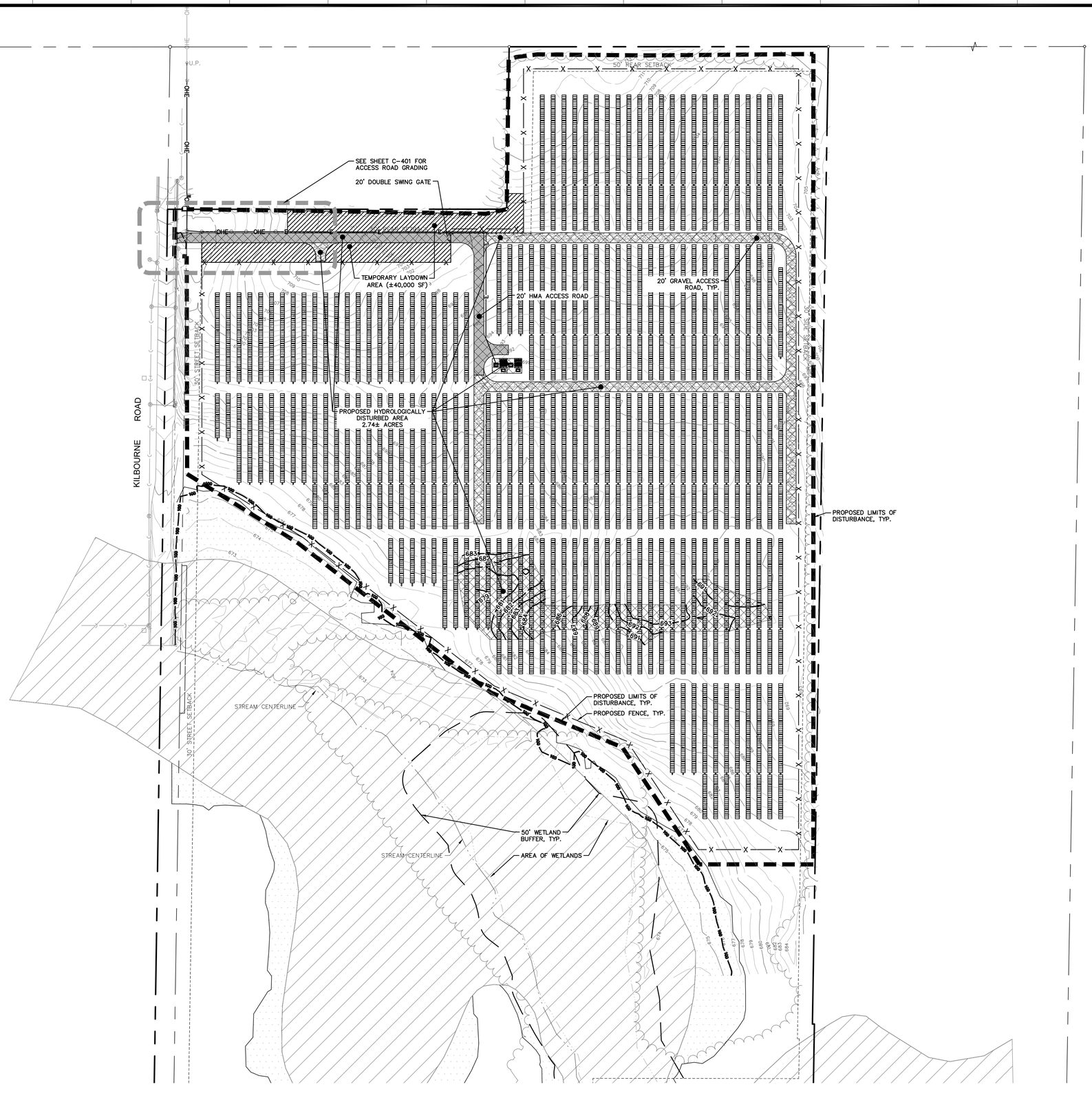

LEGEND

- BOUNDARY LINE
- EXISTING ROW
- SETBACK LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING VEGETATION LINE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- APPROXIMATE 100-YEAR FLOOD ELEVATION = 675.90
- LIMITS OF DISTURBANCE
- PROPOSED HMA ACCESS ROAD, SEE DETAIL SHEET C-600
- PROPOSED PERMANENT GRAVEL, SEE DETAIL SHEET C-600
- APPROXIMATE FLOOD ZONE AE
- APPROXIMATE FLOODWAY
- HYDROLOGICALLY DISTURBED AREA = 2.74± ACRES

EXISTING CONDITIONS BASED ON BOUNDARY SURVEY PREPARED BY FARNSWORTH GROUP, INC. DATED 11/13/2023.

THE FLOODPLAIN APPROXIMATE LOCATION IS BASED ON FEMA FLOOD MAP(S) 17097C0056K & 17097C0057K, BOTH DATED 09/18/2013. THE APPROXIMATE 100-YEAR FLOOD ELEVATION IS 675.90 FT

STORMWATER SUMMARY

DISTURBED AREA:	32.85± ACRES
PROPOSED IMPERVIOUS AREA:	1.49± ACRES
AVERAGE EXISTING SOIL RATING:	C
EXISTING COVER:	STRAIGHT ROW CROPS & WOODED
CN FOR EXISTING SITE:	85
PROPOSED COVER:	MEADOW
CN FOR PROPOSED SITE:	74

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

EROSION CONTROL AND SEDIMENTATION NOTES:

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

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

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LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
STORMWATER PLAN

DATE
APRIL 16, 2024

5/21/24	REV PER NEWPORT FPD
6/18/24	REV PER NEWPORT FPD
7/2/24	REV PER CLIENT
7/17/24	REV PER CLIENT
9/10/24	REV PER CLIENT
9/18/24	REV PER CLIENT
9/26/24	REV LAKE COUNTY
11/14/24	REV LAKE COUNTY
1/27/25	LANDSCAPE REV LAKE COUNTY
3/6/25	LANDSCAPE REV LAKE COUNTY
3/18/25	LANDSCAPE REV LAKE COUNTY

REVISIONS

SCALE 0 50 100
1" = 100 FEET

DR.CMP/LEH | CH. JC
P.M. K. WILLIAMS
BOOK
JOB 23007919
SHEET NO. C-400

NOT FOR CONSTRUCTION

CAD FILE: 23007919C-400-C.DWG

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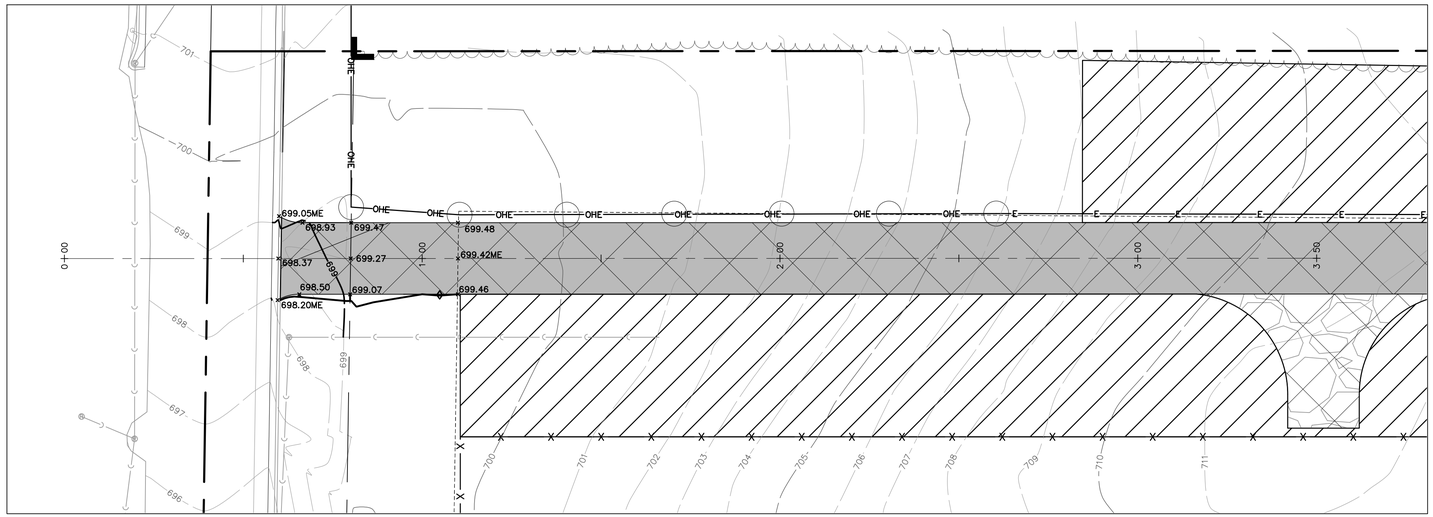
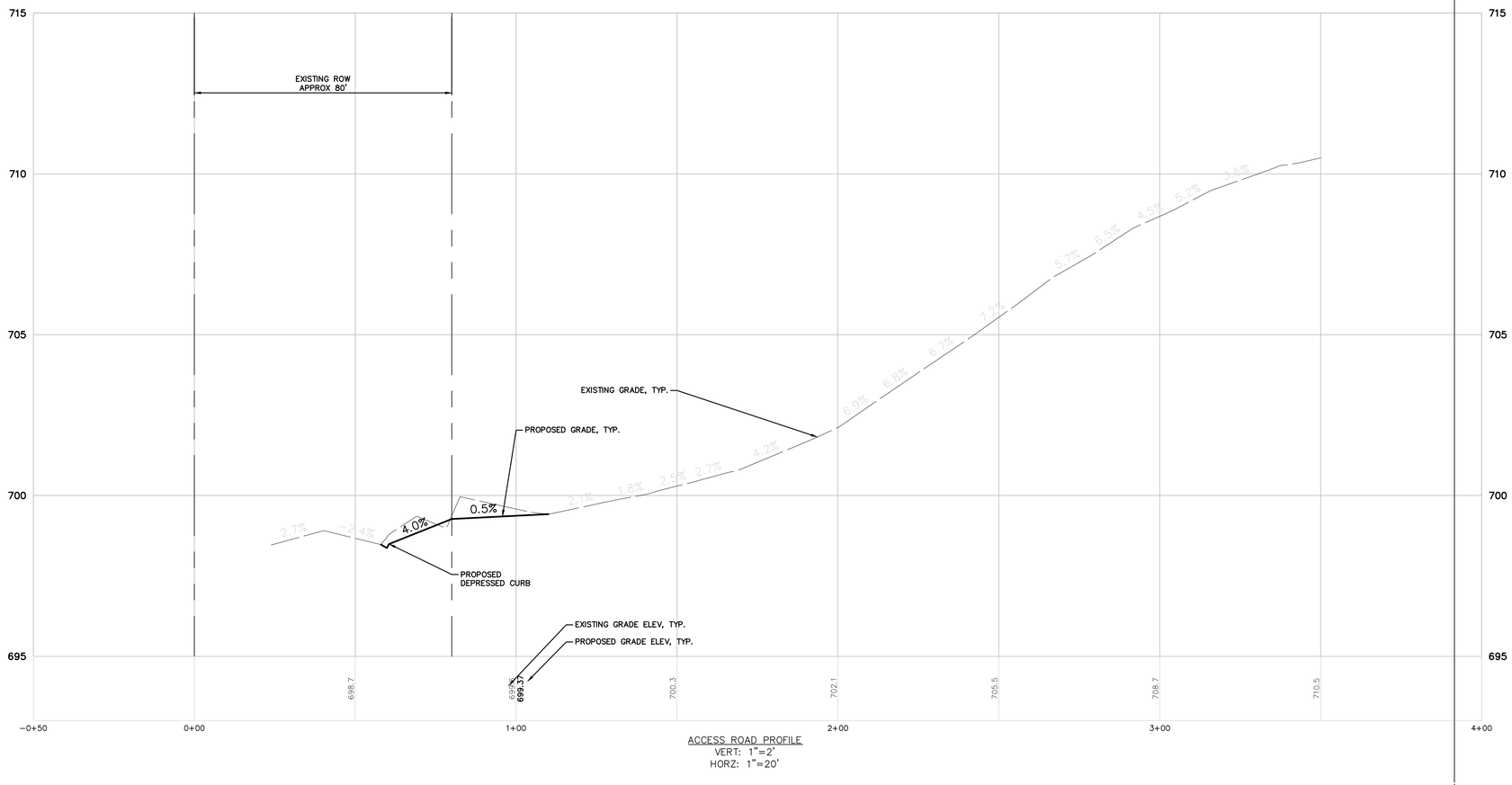


ACCESS ROAD PLAN
SCALE 1" = 20'



ACCESS ROAD PROFILE
VERT: 1"=2'
HORZ: 1"=20'

Know what's below.
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TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
ACCESS ROAD GRADING

DATE
APRIL 16, 2024

5/21/24 REV PER NEWPORT FPD
6/18/24 REV PER NEWPORT FPD
7/2/24 REV PER CLIENT
7/17/24 REV PER CLIENT
9/10/24 REV PER CLIENT
9/18/24 REV PER CLIENT
9/26/24 REV LAKE COUNTY
11/12/24 REV LAKE COUNTY
1/27/25 LANDSCAPE REV LAKE COUNTY
3/6/25 LANDSCAPE REV LAKE COUNTY
3/18/25 LANDSCAPE REV LAKE COUNTY

REVISIONS

SCALE 0 50 100
1" = 100 FEET

DR.CMP/LEH | CH. JC
P.M. K. WILLIAMS
BOOK
JOB 23007919
SHEET NO.
C-401

NOT FOR CONSTRUCTION

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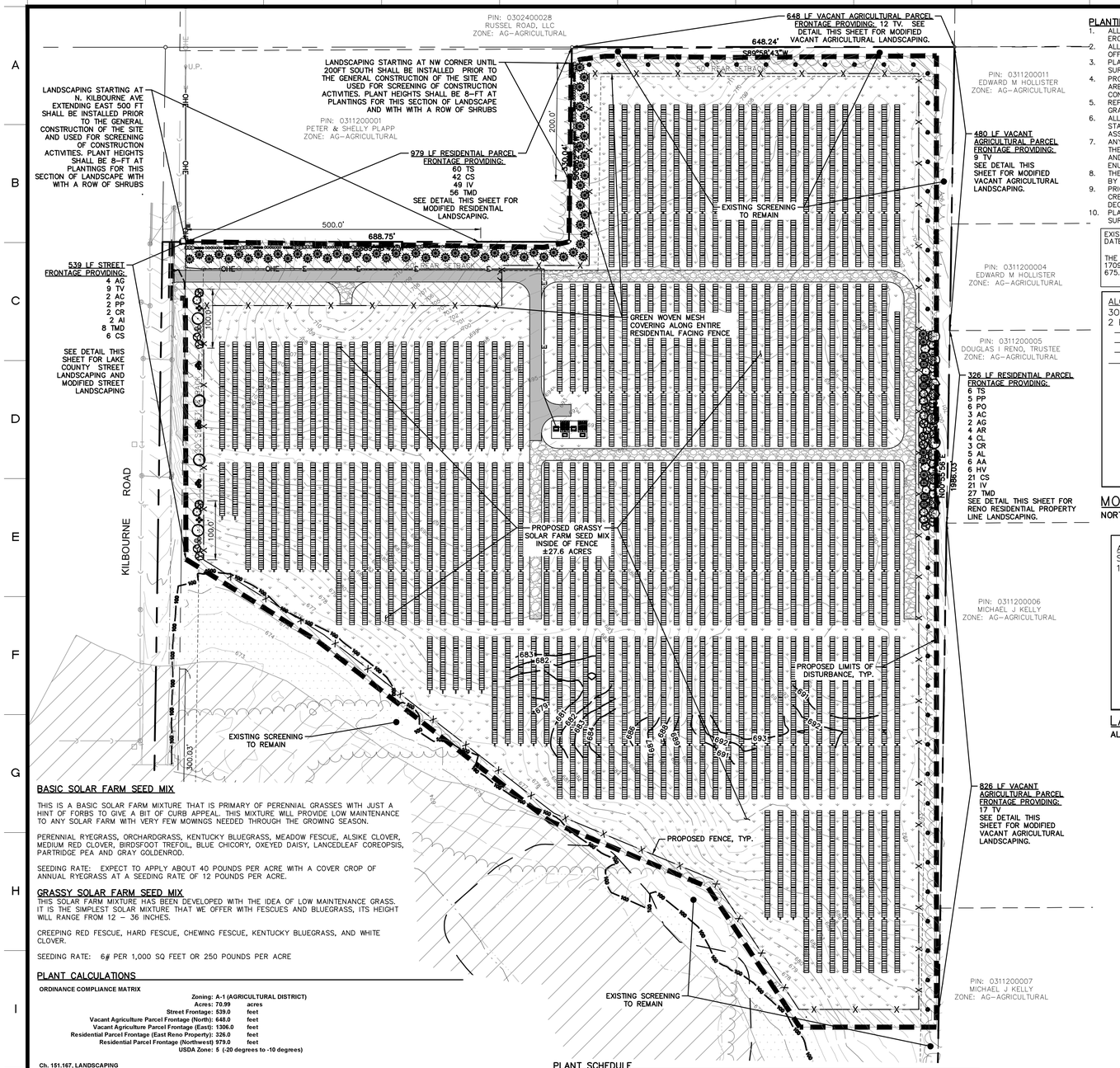


BASIC SOLAR FARM SEED MIX

THIS IS A BASIC SOLAR FARM MIXTURE THAT IS PRIMARY OF PERENNIAL GRASSES WITH JUST A HINT OF FORBS TO GIVE A BIT OF CURB APPEAL. THIS MIXTURE WILL PROVIDE LOW MAINTENANCE TO ANY SOLAR FARM WITH VERY FEW MOWINGS NEEDED THROUGH THE GROWING SEASON.

PERENNIAL RYEGRASS, ORCHARDGRASS, KENTUCKY BLUEGRASS, MEADOW FESCUE, ALSIKE CLOVER, MEDIUM RED CLOVER, BIRDSFOOT TREFOIL, BLUE CHICORY, OXEYED DAISY, LANCEDLEAF COREOPSIS, PARTRIDGE PEA AND GRAY GOLDENROD.

SEEDING RATE: EXPECT TO APPLY ABOUT 40 POUNDS PER ACRE WITH A COVER CROP OF ANNUAL RYEGRASS AT A SEEDING RATE OF 12 POUNDS PER ACRE.

GRASSY SOLAR FARM SEED MIX

THIS SOLAR FARM MIXTURE HAS BEEN DEVELOPED WITH THE IDEA OF LOW MAINTENANCE GRASS. IT IS THE SIMPLEST SOLAR MIXTURE THAT WE OFFER WITH FESCUES AND BLUEGRASS, ITS HEIGHT WILL RANGE FROM 12 – 36 INCHES.

CREEPING RED FESCUE, HARD FESCUE, CHEWING FESCUE, KENTUCKY BLUEGRASS, AND WHITE CLOVER.

SEEDING RATE: 6# PER 1,000 SQ FEET OR 250 POUNDS PER ACRE

PLANT CALCULATIONS

ORDINANCE COMPLIANCE MATRIX

Zoning:	A-1 (AGRICULTURAL DISTRICT)	
Acres:	70.99	acres
Street Frontage:	539.0	feet
Vacant Agriculture Parcel Frontage (North):	648.0	feet
Vacant Agriculture Parcel Frontage (East):	1306.0	feet
Residential Parcel Frontage (East Reno Property):	326.0	feet
Residential Parcel Frontage (Northwest)	979.0	feet
USDA Zone:	5 (-20 degrees to -10 degrees)	

Ch. 151.167, LANDSCAPING
Section H-1: Landscape standards for streets

		required		provided	
Nonresidential uses abutting an arterial or collector street or a freeway shall have one plant unit per 100 feet of road frontage	Along N. Kilbourne Road	5	canopy trees	4	canopy trees
		11	understory trees	4	understory trees
		11	evergreen trees	4	evergreen trees
		38	shrubs	23	shrubs

Section J-2: Landscape standard for transition areas

		required		provided	
Along vacant agriculture parcels abutting the property to the north and east: a 30-foot transition yard will be required that contains 2 plant units per 100 linear feet.	Along Northern Property Line	13	canopy trees	0	canopy trees
		26	understory trees	0	understory trees
		26	evergreen trees		evergreen trees
		91	shrubs	12	shrubs
	Along Eastern Property Line	26	canopy trees	0	canopy trees
		52	understory trees	0	understory trees
		52	evergreen trees	0	evergreen trees
		183	shrubs	26	shrubs
Along the north and east property lines that abut residential parcels: a 30-foot transition yard will be required that contains 3 plant units plus a 6-foot high board on board wooden fence.	Along Northwestern Property Line	29	canopy trees	0	canopy trees
		59	understory trees	0	understory trees
		59	evergreen trees	60	evergreen trees
		206	shrubs	147	shrubs
		6' board on board wooden fence		8' Fixed Knot Wire Farm Fence with 6' Green Woven Mesh	
	Along Eastern Property Line (Reno Property)	10	canopy trees	10	canopy trees
		20	understory trees	20	understory trees
		20	evergreen trees	20	evergreen trees
		69	shrubs	69	shrubs
		6' board on board wooden fence		8' Fixed Knot Wire Farm Fence with 6' Green Woven Mesh	

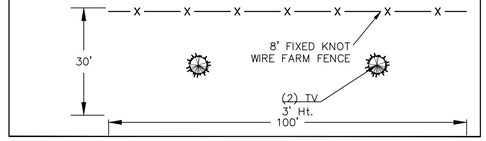
PLANTING NOTES:

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

EXISTING CONDITIONS BASED ON BOUNDARY SURVEY PREPARED BY FARNSWORTH GROUP, INC. DATED 11/13/2023.

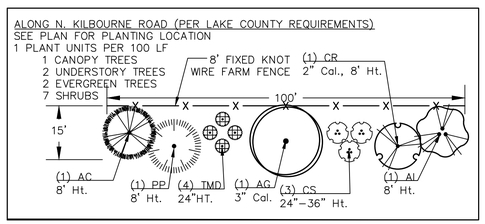
THE FLOODPLAIN APPROXIMATE LOCATION IS BASED ON FEMA FLOOD MAP(S) 17097C0056K & 17097C0057K, BOTH DATED 09/18/2013. THE APPROXIMATE 100-YEAR FLOOD ELEVATION IS 675.90 FT

ALONG VACANT AGRICULTURAL (MODIFIED)
30' SIDE SETBACK
2 PLANT UNITS PER 100 LF
~~2 CANOPY TREES~~
~~4 UNDERSTORY TREES~~
~~4 EVERGREEN TREES~~
~~14 SHRUBS~~ (2 EVERGREEN SHRUBS PROVIDED)



MODIFIED VACANT AGRICULTURAL LANDSCAPING DETAIL
NORTH & EAST PROPERTY LINES SCALE: 1"=20'-0"

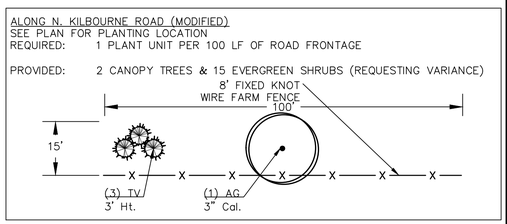
ALONG N. KILBOURNE ROAD (PER LAKE COUNTY REQUIREMENTS)
SEE PLAN FOR PLANTING LOCATION
1 PLANT UNITS PER 100 LF
1 CANOPY TREES
2 UNDERSTORY TREES
2 EVERGREEN TREES
7 SHRUBS



LAKE COUNTY STREET LANDSCAPING DETAIL
ALONG N. KILBOURNE ROAD SCALE: 1"=20'

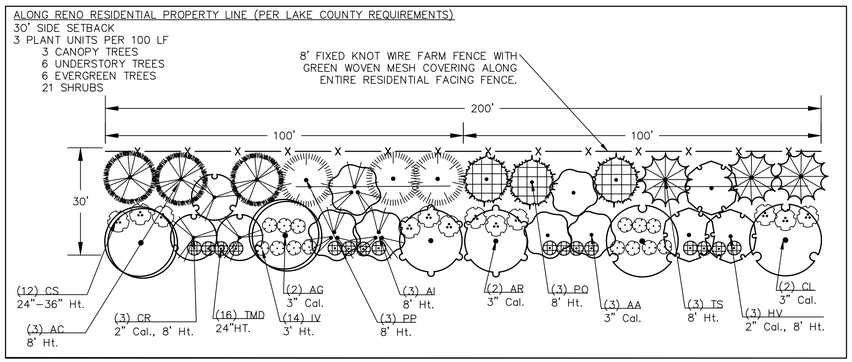
ALONG N. KILBOURNE ROAD (MODIFIED)
SEE PLAN FOR PLANTING LOCATION
REQUIRED: 1 PLANT UNIT PER 100 LF OF ROAD FRONTAGE

PROVIDED: 2 CANOPY TREES & 15 EVERGREEN SHRUBS (REQUESTING VARIANCE)



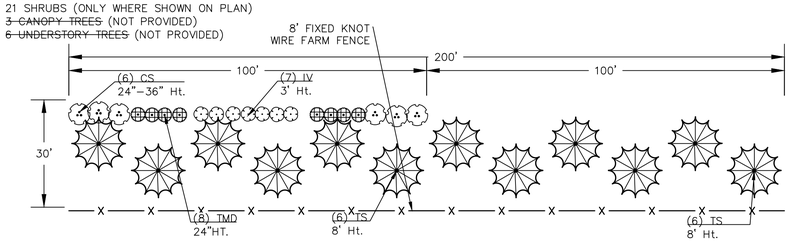
MODIFIED STREET LANDSCAPING DETAIL
ALONG N. KILBOURNE ROAD SCALE: 1"=20'

ALONG RENO RESIDENTIAL PROPERTY LINE (PER LAKE COUNTY REQUIREMENTS)
30' SIDE SETBACK
3 PLANT UNITS PER 100 LF
3 CANOPY TREES
6 UNDERSTORY TREES
6 EVERGREEN TREES
21 SHRUBS



LAKE COUNTY RESIDENTIAL LANDSCAPING DETAIL
EASTERN PROPERTY LINE SCALE: 1"=20'-0"

ALONG NORTHWESTERN RESIDENTIAL PROPERTY LINE (MODIFIED)
30' SIDE SETBACK
3 PLANT UNITS PER 100 LF
6 EVERGREEN TREES
21 SHRUBS (ONLY WHERE SHOWN ON PLAN)
~~3 CANOPY TREES~~ (NOT PROVIDED)
~~6 UNDERSTORY TREES~~ (NOT PROVIDED)



MODIFIED RESIDENTIAL LANDSCAPING DETAIL
NORTHWESTERN PROPERTY LINES SCALE: 1"=20'-0"

PLANT SCHEDULE

EVERGREEN TREES

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	MATURE HEIGHT	NATIVE	REMARKS/SPEC.	PERCENTAGE	NOTE
AC	5	Picea abies	Norway Spruce	8' Ht.	40'-60'		B&B	6%	
PO	6	Picea omorika	Serbian Spruce	8' Ht.	30'-40'		B&B	7%	
PP	7	Picea pungens	Colorado Spruce	8' Ht.	30'-50'		B&B	8%	
TS	66	Thuja shandisihii x plicata	Green Giant Arborvitae	8' Ht.	30'-50'		B&B	79%	Shall be trimmed and maintained to a height of 30 ft
Total	84								

SHADE TREES

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	MATURE HEIGHT	NATIVE	REMARKS/SPEC.	PERCENTAGE
AG	6	Aesculus glabra	Ohio Buckeye	2" Cal.	20-40'	X	B&B	43%
AR	4	Acer rubrum	Red Maple	2" Cal.	40'-60'		B&B	29%
CL	4	Cladrastis lutea	Yellowood	2" Cal.	30-50'		B&B	29%
Total	14							

UNDERSTORY TREES

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	MATURE HEIGHT	NATIVE	REMARKS/SPEC.	PERCENTAGE
AA	6	Amelanchier arborea "Autumn Brilliance"	Downy Service Berry	3" Cal.	15'-25'	X	B&B	25%
AI	7	Amelanchier interior	Inland shadblow	2"-12" Cal.	15-25'	X	B&B	29%
CR	5	Cercis canadensis	Eastern Redbud	2-1/2" Cal.****, mult-stem	20-25'	X	B&B	21%
HV	6	Hamamelis virginiana	Common Witch Hazel	2-1/2" Cal.****, mult-stem	15-25'	X	B&B	25%
Total	24							

SHRUBS

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	MATURE HEIGHT	NATIVE	REMARKS/SPEC.	PERCENTAGE
CS	69	Cornus stolonifera	Red osier dogwood	36"-42" Ht.	5-8'	X		25%
IV	70	Illex virginica	Sweetspire	36"-42" Ht.	5-8'			25%
TMD	91	Taxus x media 'Densiformis'	Dense Yew	36"-42" Ht.	5-8'			33%
TV	47	Thuja Varieties	Arborvitae	3' Ht.	10'-15'		B&B	17%
Total	277							

LEGEND

- BOUNDARY LINE
- BOUNDARY ADJACENT LINE
- EXISTING ROW
- EXISTING CONTOUR (685 / 684)
- EXISTING CONTOUR (685 / 684)
- EXISTING STORM SEWER
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING STREAM CENTERLINE
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- APPROXIMATE 100-YEAR FLOOD ELEVATION VARIES
- EXISTING VEGETATION LINE
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED HMA ACCESS ROAD, SEE DETAIL SHEET C-600
- PROPOSED PERMANENT GRAVEL, SEE DETAIL SHEET C-600
- PROPOSED GRASSY SOLAR FARM SEED MIX (27.6± ACRES)
- PROPOSED BASIC SOLAR FARM SEED MIX (3.8± ACRES)
- APPROXIMATE FLOOD ZONE AE
- APPROXIMATE FLOODWAY

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

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

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

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ATWELL

PART OF THE NE 1/4 SECTION 11
TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
LANDSCAPE PLAN

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

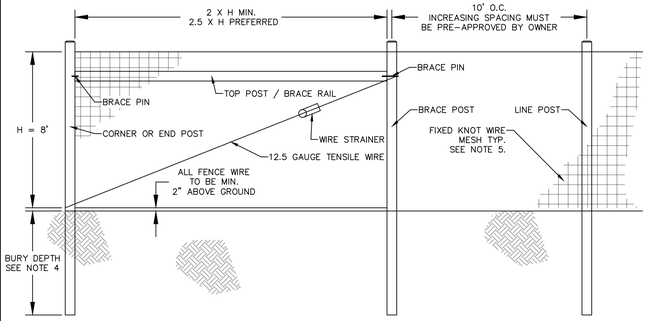
REVISIONS
5/21/24 REV PER NEWPORT FPD
6/18/24 REV PER NEWPORT FPD
7/12/24 REV PER CLIENT
7/17/24 REV PER CLIENT
9/10/24 REV PER CLIENT
9/18/24 REV PER CLIENT
9/26/24 REV LAKE COUNTY
11/14/24 REV LAKE COUNTY
1/27/25 LANDSCAPE REV LAKE COUNTY
3/26/25 LANDSCAPE REV LAKE COUNTY
5/28/25 LANDSCAPE REV LAKE COUNTY

SCALE 0 50 100
1" = 100 FEET

DR. CMP/LEH | CH. JC
P.M. K. WILLIAMS
BOOK
JOB 23007919
SHEET NO. C-500

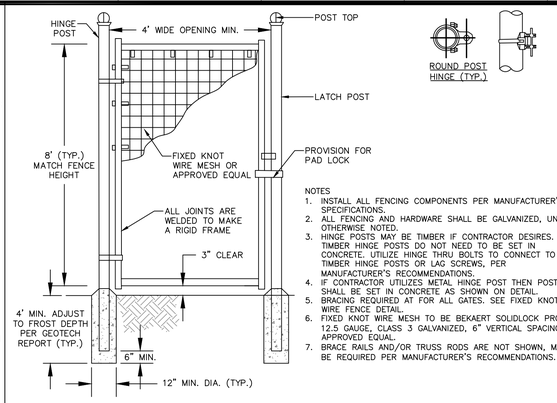
CAD FILE: 23007919C-500-LSDWG

PROFESSIONAL ENGINEER KERYL W. [redacted] 062-058862 3/28/25 STATE OF ILLINOIS



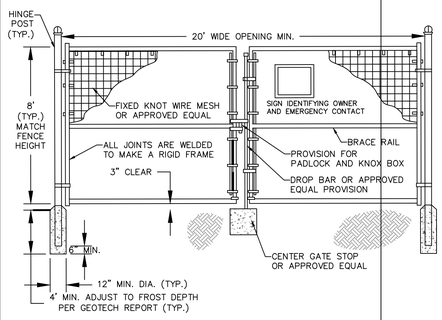
FIXED KNOT WIRE FENCE
NOT TO SCALE

NOTES
1. INSTALL ALL FENCING COMPONENTS PER MANUFACTURES SPECIFICATIONS.
2. ALL FENCING AND HARDWARE SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. ALL SQUARE POSTS TO BE MIN. 5"X5" NOMINAL SIZE OR ROUND POST WITH MIN. 5" OR 6" DIAMETER PRESSURE TREATED WOOD OR APPROVED EQUAL. PREFER POSTS TO HAVE A CHAMFERED TOP.
4. ALL LINE POST TO BE SET TO A MIN. DEPTH OF 4' BELOW GRADE, ALL CORNER, END, OR GATE POSTS SHALL BE SET TO A MIN. DEPTH OF 6' BELOW GRADE, UNLESS OTHERWISE NOTED.
5. FIXED KNOT WIRE MESH TO BE BEKAERT SOLIDLOCK² PRO, 12.5 GAUGE, CLASS 3 GALVANIZED, 6" VERTICAL SPACING OR APPROVED EQUAL.
6. BRACING IS REQUIRED AT ALL CORNER, END, AND GATE POSTS. DOUBLE BRACING (TWO BRACE ASSEMBLIES IN A ROW) SHOULD BE USED FOR STRAIGHT RUNS OF FENCE THAT EXCEED 1,000 LF. AN ADDITIONAL BRACE ASSEMBLY SHOULD BE INSTALLED MID SPAN FOR STRAIGHT RUNS OF FENCE THAT EXCEED 1,320 LF. ADDITIONAL BRACING MAY BE STILL BE REQUIRED OVER UNEVEN TERRAIN, CONTRACTOR SHALL INSTALL ADDITIONAL BRACING AS NEEDED IF DEFLECTION IS NOTICED DURING TENSIONING.
7. CUT 8"WX12"H SMALL ANIMAL PASSAGES ON BOTTOM OF MESH AT 100 FOOT INTERVALS AROUND PERIMETER.
8. INSTALL 6' WIDE PEDESTRIAN GATES AT LOCATIONS SHOWN ON PLAN TO ALLOW GATE TO BE OPENED BY EMERGENCY SERVICES PERSONNEL FOR EMERGENCY WILDLIFE EGRESS.



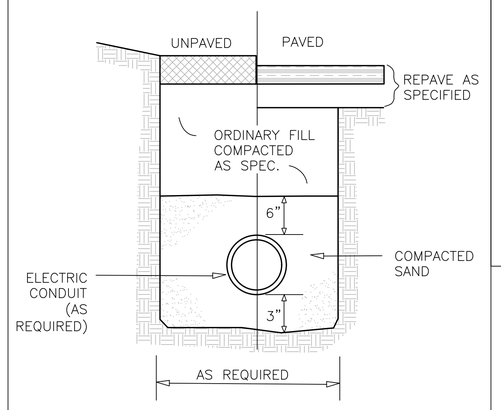
NOTES
1. INSTALL ALL FENCING COMPONENTS PER MANUFACTURER'S SPECIFICATIONS.
2. ALL FENCING AND HARDWARE SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. HINGE POSTS MAY BE TIMBER IF CONTRACTOR DESIRES. TIMBER HINGE POSTS DO NOT NEED TO BE SET IN CONCRETE. UTILIZE HINGE THRU BOLTS TO CONNECT TO TIMBER HINGE POSTS OR LAG SCREWS, PER MANUFACTURER'S RECOMMENDATIONS.
4. IF CONTRACTOR UTILIZES METAL HINGE POST THEN POSTS SHALL BE SET IN CONCRETE AS SHOWN ON DETAIL.
5. BRACING REQUIRED AT FOR ALL GATES. SEE FIXED KNOT WIRE FENCE DETAIL.
6. FIXED KNOT WIRE MESH TO BE BEKAERT SOLIDLOCK PRO, 12.5 GAUGE, CLASS 3 GALVANIZED, 6" VERTICAL SPACING OR APPROVED EQUAL.
7. BRACE RAILS AND/OR TRUSS RODS ARE NOT SHOWN, MAY BE REQUIRED PER MANUFACTURER'S RECOMMENDATIONS.

FIXED KNOT WIRE FENCE – PERSONNEL GATE
NOT TO SCALE

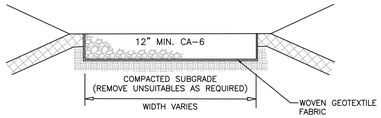


NOTES
1. INSTALL ALL FENCING COMPONENTS PER MANUFACTURER'S SPECIFICATIONS.
2. ALL FENCING AND HARDWARE SHALL BE GALVANIZED, UNLESS OTHERWISE NOTED.
3. HINGE POSTS MAY BE TIMBER IF CONTRACTOR DESIRES. TIMBER HINGE POSTS DO NOT NEED TO BE SET IN CONCRETE. UTILIZE HINGE THROUGH BOLTS TO CONNECT TO TIMBER HINGE POSTS OR LAG SCREWS, PER MANUFACTURER'S RECOMMENDATIONS.
4. IF CONTRACTOR UTILIZES METAL HINGE POST THEN POSTS SHALL BE SET IN CONCRETE AS SHOWN ON DETAIL.
5. BRACING REQUIRED AT FOR ALL GATES. SEE FIXED KNOT WIRE FENCE DETAIL.
6. FIXED KNOT WIRE MESH TO BE BEKAERT SOLIDLOCK PRO, 12.5 GAUGE. CLASS 3 GALVANIZED, 6" VERTICAL SPACING OR APPROVED EQUAL.
7. BRACE RAIL SHOWN FOR REFERENCE. ADDITIONAL BRACE RAILS MAY BE REQUIRED (NOT SHOWN) OR TRUSS RODS MAY BE REQUIRED PER MANUFACTURER'S RECOMMENDATIONS.

20' WIDE FIXED KNOT WIRE FENCE – DOUBLE SWING GATE
NOT TO SCALE

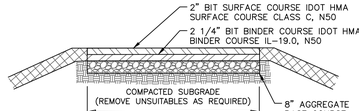


ELECTRIC CONDUIT TRENCH
NOT TO SCALE



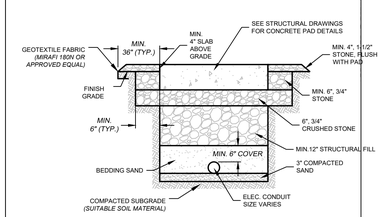
NOTES:
1. REMOVE TOPSOIL AND ALL UNSUITABLE MATERIAL AS REQUIRED AND REPLACE WITH GRAVEL.
2. GEOGRID FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION 592 GEOTEXTILE, TABLE 1 OR 2, CLASS I, II, OR IV AND SHALL BE PLACED OVER THE CLEARED AREA PRIOR TO THE PLACING OF ROCK.

GRAVEL ACCESS ROAD SECTION
NOT TO SCALE

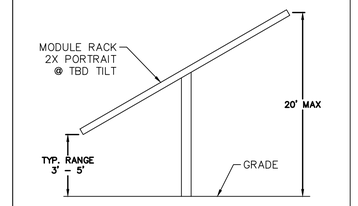


NOTES:
1. REMOVE TOPSOIL AND ALL UNSUITABLE MATERIAL AS REQUIRED AND REPLACE WITH GRAVEL.
2. ACCESS DRIVES TO SLOPE IN THE DIRECTION OF THE EXISTING GRADE. DRIVEWAY SHALL BE GRADED TO ALLOW STORMWATER TO SHEET DRAIN ACROSS IT AND TO PREVENT PUDDLING.

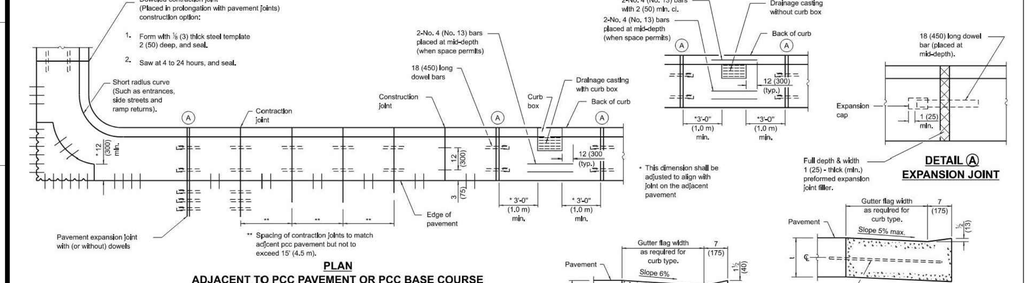
HMA ACCESS DRIVE CROSS SECTION
NOT TO SCALE



SUBSOIL EQUIPMENT FOUNDATION DETAIL
NOT TO SCALE

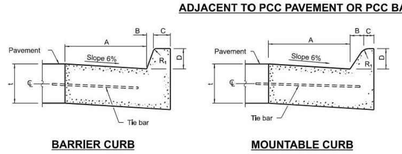


SOLAR ARRAY RACK DETAIL
NOT TO SCALE



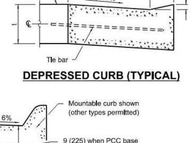
PLAN
ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE

DETAIL Ⓐ
EXPANSION JOINT

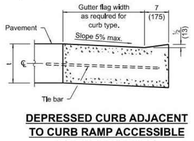


BARRIER CURB

MOUNTABLE CURB



DEPRESSED CURB (TYPICAL)



DEPRESSED CURB ADJACENT TO CURB RAMP ACCESSIBLE TO THE DISLABED

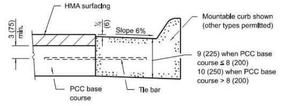
TABLE OF DIMENSIONS
BARRIER CURB

TYPE	A	B	C	D	R_1
B-6.06 *	6	1	6	6	1
(B-15.15)	(150)	(25)	(150)	(150)	(25)
B-6.12	12	1	6	6	1
(B-15.3)	(300)	(25)	(150)	(150)	(25)
B-6.18	18	1	6	6	1
(B-15.45)	(450)	(25)	(150)	(150)	(25)
B-6.24	24	1	6	6	1
(B-15.60)	(600)	(25)	(150)	(150)	(25)
B-9.12	12	2	5	9	1
(B-22.30)	(300)	(50)	(125)	(225)	(25)
B-9.18	18	2	5	9	1
(B-22.45)	(450)	(50)	(125)	(225)	(25)
B-9.24	24	2	5	9	1
(B-22.60)	(600)	(50)	(125)	(225)	(25)

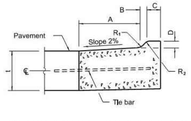
* For corner Islands only.

TABLE OF DIMENSIONS
MOUNTABLE CURB

TYPE	A	B	C	D	R_1	R_2
M-2.06	6	2	4	2	3	2
(M-5.15)	(150)	(50)	(100)	(50)	(75)	(50)
M-2.12	12	2	4	2	3	2
(M-5.30)	(300)	(50)	(100)	(50)	(75)	(50)
M-4.06	6	4	3	4	3	NA
(M-10.15)	(150)	(100)	(75)	(100)	(75)	
M-4.12	12	4	3	4	3	NA
(M-10.30)	(300)	(100)	(75)	(100)	(75)	
M-4.18	18	4	3	4	3	NA
(M-10.45)	(450)	(100)	(75)	(100)	(75)	
M-4.24	24	4	3	4	3	NA
(M-10.60)	(600)	(100)	(75)	(100)	(75)	
M-6.06	6	2	6	2	6	2
(M-15.15)	(150)	(50)	(150)	(50)	(150)	(50)
M-6.12	12	2	6	2	6	2
(M-15.30)	(300)	(50)	(150)	(50)	(150)	(50)
M-6.18	18	2	6	2	6	2
(M-15.45)	(450)	(50)	(150)	(50)	(150)	(50)
M-6.24	24	2	6	2	6	2
(M-15.60)	(600)	(50)	(150)	(50)	(150)	(50)



ADJACENT TO PCC BASE COURSE WITH HMA SURFACING



M-2.06 (M-5.15) and M-2.12 (M-5.30)

GENERAL NOTES
The bottom slope of combination curb and gutter constructed adjacent to pcc pavement shall be the same slope as the subbase or 6% when subbase is omitted.

t = Thickness of pavement.

Longitudinal joint tie bars shall be No. 6 (No. 19) at 36 (800) centers in accordance with details for longitudinal construction joint shown on Standard 420001.

A minimum clearance of 2 (50) between the end of the tie bar and the back of the curb shall be maintained.

The dowel bars shown in contraction joints will only be required for monolithic construction.

See Standard 606301 for details of corner Islands.

All dimensions are in inches (millimeters) unless otherwise shown.

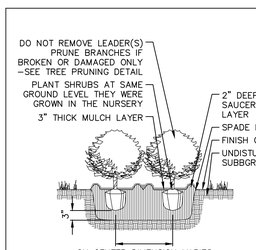
Illinois Department of Transportation

APPROVED January 1, 2022
Mark D. Wood
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2022
John C. Baranzelli
ENGINEER OF BUREAU OF ROADWAY PROGRAMMING

DATE	REVISIONS
1-1-22	Revised contract joint spacing
	adjacent to pcc pavement.
1-1-18	Revised General Note for tie bar
	spacing to 36 (900) cts.

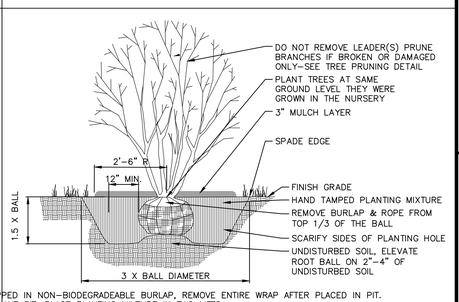
CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER
(Sheet 1 of 2)

STANDARD 606001-08



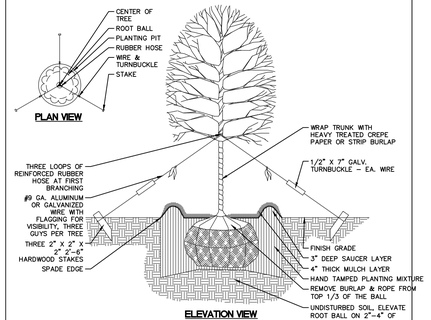
NOTES:
1. PLANTING MIXTURE SHALL INCLUDE:
   - 1 PART PEAT OR OTHER APPROVED ORGANIC MATTER
   - 4 PARTS NATIVE SOIL
   - 1/2 LB 10-10-10 FERTILIZER PER CU. YD. OF BACKFILL OR APPROVED SUBSTITUTE

CONTAINER SHRUB PLANTING DETAIL
NOT TO SCALE



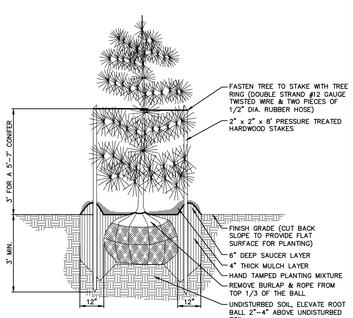
NOTES:
1. IF ROOTBALL IS WRAPPED IN NON-BIODEGRADEABLE BURLAP, REMOVE ENTIRE WRAP AFTER PLACED IN PIT.
2. WHEN BACKFILLING PLANT PIT, PLACE PLANTING MIXTURE IN TWO LIFTS.
   - AFTER FIRST LIFT, PUDDLE SOIL IN WITH WATER TO REMOVE ALL AIR POCKETS.
   - PLACE SECOND LIFT AND REPEAT.
   - CONTINUE TO PUDDLE AND FILL AS NECESSARY.
3. PLANTING MIXTURE SHALL INCLUDE:
   - 1 PART PEAT OR OTHER APPROVED ORGANIC MATTER
   - 4 PARTS NATIVE SOIL
   - 1/2 LB 10-10-10 FERTILIZER PER CU. YD. OF BACKFILL OR APPROVED SUBSTITUTE

MULTI-STEMMED TREE PLANTING DETAIL
NOT TO SCALE



NOTES:
1. PLANTING DETAIL APPLIES TO ALL DECIDUOUS TREES AND LARGE EVERGREEN SHRUBS.
2. SHRUB MULCH RING AND PLANTING PIT SHALL BE TWICE THE DIAMETER OF THE ROOT BALL.
3. CONTRACTOR SHALL PRUNE PER TREE PRUNING DETAIL AS NEEDED.
4. DO NOT ALLOW AIR POCKETS TO FORM WHEN BACKFILLING.
5. DO NOT DAMAGE MAIN ROOTS OR DESTROY ROOT BALL WHEN INSTALLING TREE STAKES.
6. REMOVE TREE RINGS, AND GUYS/STAKES ONE YEAR AFTER INSTALLATION.
7. WATER TREE THOROUGHLY SUBSEQUENT TO INSTALLATION.
8. TREE SHALL BE PLACED IN SAME ORIENTATION AS IT WAS GROWN AT THE NURSERY.
9. PLANTING MIXTURE SHALL INCLUDE:
   - 1 PART PEAT OR OTHER APPROVED ORGANIC MATTER
   - 4 PARTS NATIVE SOIL
   - 1/2 LB 10-10-10 FERTILIZER PER CU. YD. OF BACKFILL OR APPROVED SUBSTITUTE

DECIDUOUS CANOPY TREE PLANTING DETAIL (2" CAL. OR GREATER)
NOT TO SCALE



NOTES:
1. PLANTING DETAIL APPLIES TO ALL DECIDUOUS TREES AND LARGE EVERGREEN SHRUBS.
2. SHRUB MULCH RING AND PLANTING PIT SHALL BE TWICE THE DIAMETER OF THE ROOT BALL.
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   - 4 PARTS NATIVE SOIL
   - 1/2 LB 10-10-10 FERTILIZER PER CU. YD. OF BACKFILL OR APPROVED SUBSTITUTE

CONIFEROUS TREE PLANTING DETAIL BALLED AND BURLAPPED
NOT TO SCALE

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

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

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

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ATWELL

PART OF THE NE 1/4 SECTION 11
TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
DETAILS

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

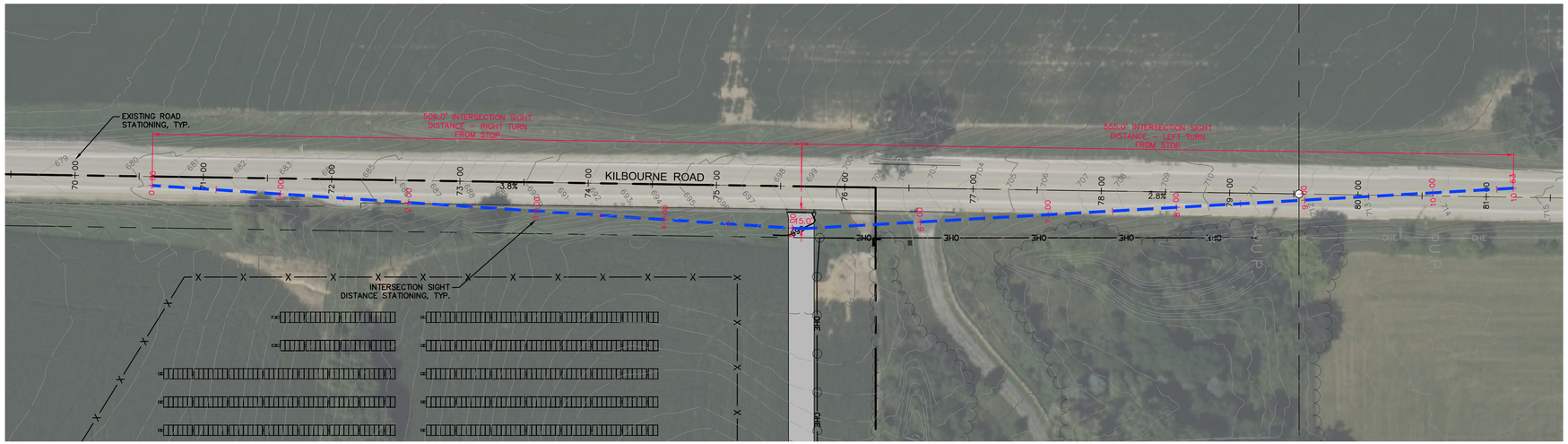
5/21/24 REV PER NEWPORT FPD
6/18/24 REV PER NEWPORT FPD
7/22/24 REV PER CLIENT
7/17/24 REV PER CLIENT
9/10/24 REV PER CLIENT
9/18/24 REV PER CLIENT
9/26/24 REV LAKE COUNTY
11/14/24 REV LAKE COUNTY
1/27/25 LANDSCAPE REV LAKE COUNTY
3/6/25 LANDSCAPE REV LAKE COUNTY
3/18/25 LANDSCAPE REV LAKE COUNTY

REVISIONS

SCALE
N.T.S.

DR.CMP/LEH | CH. JC
P.M. K. WILLIAMS
BOOK
JOB 23007919
SHEET NO.
C-600

CAD FILE: 23007919C-600-DT.DWG



INTERSECTION SIGHT DISTANCE PLAN
SCALE 1" = 50'

LEGEND

- BOUNDARY LINE
- EXISTING ROW
- SETBACK LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING STORM SEWER
- PROPOSED UNDERGROUND ELECTRIC
- EXISTING OVERHEAD ELECTRIC
- PROPOSED OVERHEAD ELECTRIC
- EXISTING FENCE
- PROPOSED FENCE
- EXISTING VEGETATION LINE
- INTERSECTION SIGHT DISTANCE
- PROPOSED HMA ACCESS ROAD, SEE DETAIL SHEET C-600

EXISTING CONDITIONS BASED ON BOUNDARY SURVEY PREPARED BY FARNSWORTH GROUP, INC. DATED 11/13/2023.

THE FLOODPLAIN APPROXIMATE LOCATION IS BASED ON FEMA FLOOD MAP(S) 17097C0056K & 17097C0057K, BOTH DATED 09/18/2013. THE APPROXIMATE 100-YEAR FLOOD ELEVATION IS 675.90 FT

INTERSECTION SIGHT DISTANCE CALCULATIONS:

THE INTERSECTION SIGHT DISTANCE CALCULATIONS ARE PER THE AASHTO GREEN BOOK 7TH EDITION – 2018. KILBOURNE ROAD IS 45 MPH. THE FOLLOWING INTERSECTION SIGHT DISTANCE CALCULATIONS WERE MADE:

POSTED SPEED: 45 MPH
DESIGN SPEED: 50 MPH

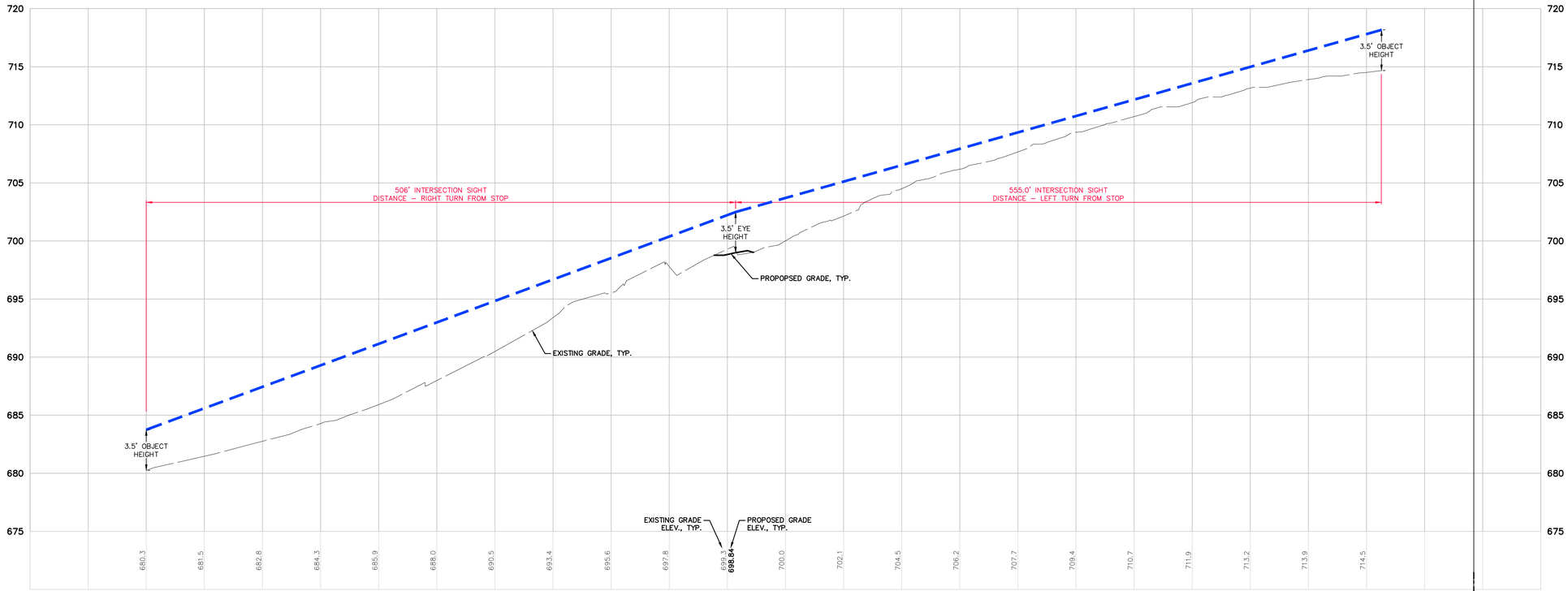
RIGHT TURN FROM STOP

EXISTING ROAD APPROACH GRADE:	3.8%
PASSENGER CAR TIME GAP:	6.5 SECONDS
TIME GAP ADJUSTMENT*:	0.38 SECONDS
ADJUSTED TIME GAP:	6.88 SECONDS
ADJUSTED INTERSECTION SIGHT DISTANCE**:	506 FEET

*(FOR ROADS THAT EXCEED 3%, ADD 0.1 SECONDS PER GRADE THAT EXCEEDS 0%)
**DS=(1.47)(50MPH)(6.88 SECONDS)

LEFT TURN FROM STOP

EXISTING ROAD APPROACH GRADE:	2.8%
PASSENGER CAR TIME GAP:	7.5 SECONDS
INTERSECTION SIGHT DISTANCE:	555 FEET



INTERSECTION SIGHT DISTANCE PROFILE
VERT: 1"=5'
HORZ: 1"=50'

Know what's below. Call before you dig.

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ATWELL

PART OF THE NE 1/4 SECTION 11
TOWNSHIP 46 NORTH, RANGE 11 EAST
NEWPORT TOWNSHIP
LAKE COUNTY, ILLINOIS

CLIENT
ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET
LAKE COUNTY, ILLINOIS

CONDITIONAL USE PERMIT PLANS
LCDOT INTERSECTION SIGHT DISTANCE

NOT FOR CONSTRUCTION

DATE
APRIL 16, 2024

5/21/24
REV PER NEWPORT FPD
6/18/24
REV PER NEWPORT FPD
7/2/24
REV PER CLIENT
7/17/24
REV PER CLIENT
9/10/24
REV PER CLIENT
9/18/24
REV PER CLIENT
9/26/24
REV LAKE COUNTY
11/14/24
REV LAKE COUNTY
1/27/25
LANDSCAPE REV LAKE COUNTY
3/6/25
LANDSCAPE REV LAKE COUNTY
3/18/25
LANDSCAPE REV LAKE COUNTY

REVISIONS

SCALE 0 50 100
1" = 100 FEET

BOOK

JOB 23007919

SHEET NO.
C-700

CAD FILE: 23007-700-SD.DWG

KERI L. WILLIAMS
062-058662
3/18/25
EXPIRES: 11/30/26
STATE OF ILLINOIS
LICENSED PROFESSIONAL ENGINEER

I:\23007\PLOT\PLOT-PRELIMINARY\23007PRE-700-SD.DWG | 3/18/2025 2:52 PM | LAUREN ALLIS

APPENDIX H

NRI Report Application

Natural Resource Information Report Application

McHenry-Lake County Soil and Water Conservation District

1648 S. Eastwood Dr., Woodstock, IL 60098 Voice: (815) 338-0444 x 3 www.mchenryswcd.org

For office use only

File Number:_____-_____-_____ Date Received:_____20_____

Fee:_____ (*Please make check payable to McHenry-Lake County SWCD.*)

The McHenry-Lake County SWCD has thirty (30) days to complete this report after receipt of **ALL** the following items and after presentation to SWCD Board of Directors at their regularly scheduled meeting: Board meetings are scheduled for the first Tuesday of each month at the SWCD office.

Application Check List: (*Include your Tentative Plat, Intensive Soil Survey, Tile Investigation, & Certified Wetland Determination if available)*

Plat of Survey: ☑ **Petition:** ☐ **Fee:** ☑
Tentative plat: ☐ **Intensive Soil Survey:** ☐ **Tile Investigation:** ☐
Certified Wetland Determination/Delineation: ☑

Processing of the NRI report will not begin until all of the required items have been received by the MLCSWCD (office unless otherwise indicated by SWCD Staff)

Fee: Full report: $400.00 for 1-3 acres and $25.00 for each additional acre or part thereof.
Letter: $100.00 *SWCD will determine when letter or full report format will be necessary*.

Petitioner's Name: Zion Community Energy Initiative LLC **Phone** [redacted]

[redacted]

Contact Person: Keri Williams **Phone**:([redacted]

[redacted]

Parcel Index Number(s): (**1**) 03 - 11 - 200 - 014 (**2**)___-_____-_____-_____
(**3**)___-_____-_____-_____
Aggregate parcel size 70.99 (**acres**)

Current Zoning: agriculture **Requested Zoning**: agriculture

Description of Zoning Request: community solar array system with gravel access drive

Proposed Improvements:

☐ Dwellings on Slabs	☐ Common Open Space	☐ Drainage Ditches/Swales
☐ Dwellings with Basements	☐ Sewers	☐ Wet Retention Basin
☐ Commercial Buildings	☐ Individual Wells	☐ Storm Sewers
☐ Park/Playground Areas	☐ Community Water	☐ Dry Detention Basin
☐ Conservation Easements	☐ Septic Systems	☑ Other community solar array system

Unit of Government Responsible: ☐ **County of McHenry** ☑ **County of Lake**
☐ **City/Town of**_____

Is the parcel within 1 mile of a Village or City Boundary? ☑ **Yes** ☐ **No**

If yes, which (City/Town/Village)? Zion

It is understood that filing this application allows a district representative the right to conduct an onsite investigation of the parcel(s) described above. Furthermore, this report becomes subject to the Freedom of Information Act after presentation to the District Board of directors at their regularly scheduled meeting.

Contact person or Petitioner's signature: [redacted] **Date**: 04 /23 /20 24

APPENDIX I

NRI Report

McHENRY-LAKE COUNTY SOIL & WATER CONSERVATION DISTRICT

NATURAL RESOURCES INFORMATION REPORT

24-045-4601

May 1, 2024

This report has been prepared for:
Zion Community Energy Initiative LLC

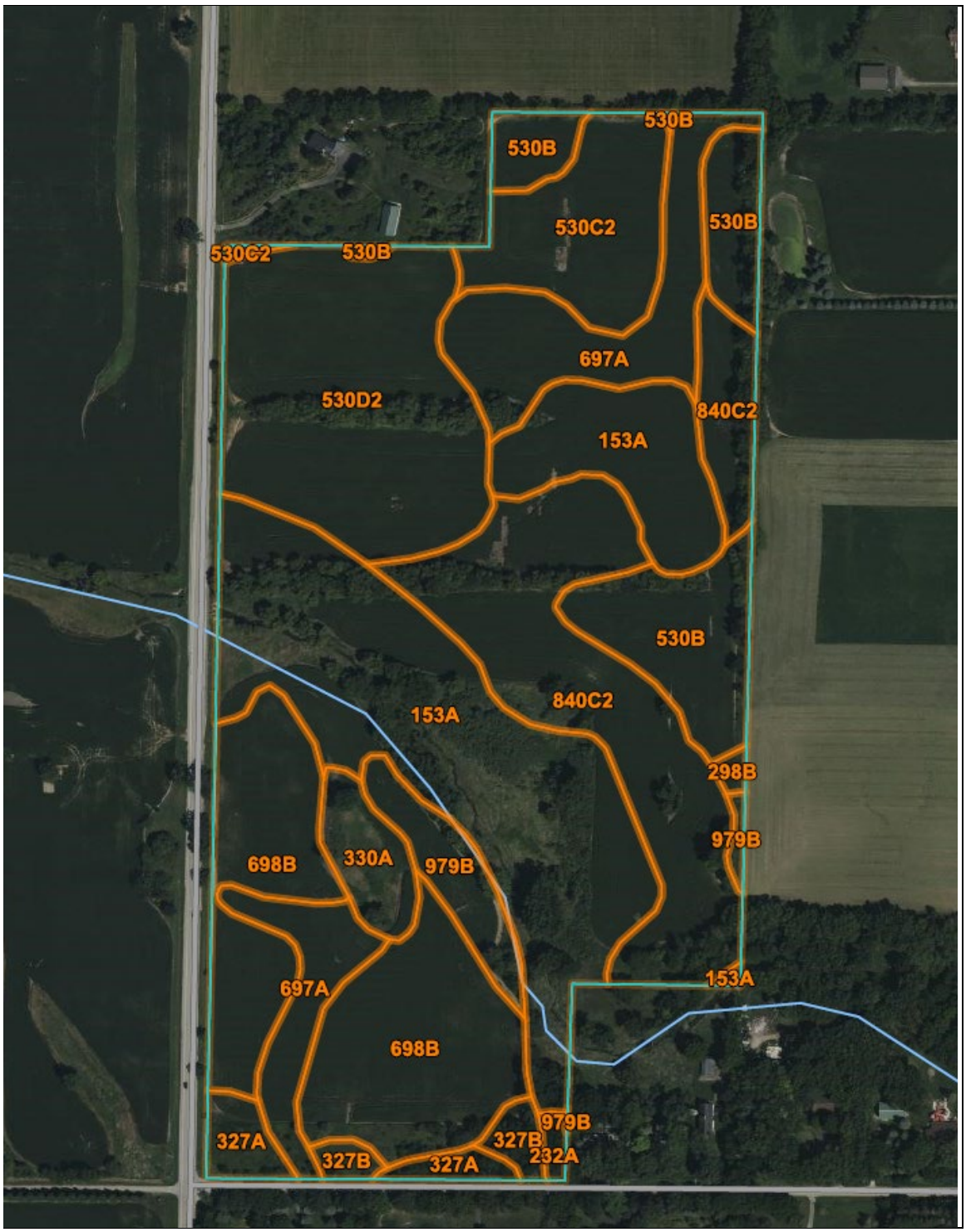
Contact Person:
Keri Williams

PREPARED BY:
McHENRY-LAKE COUNTY SOIL & WATER CONSERVATION DISTRICT
1648 S. EASTWOOD DR.
WOODSTOCK, IL 60098
PHONE: (815) 338-0444
www.mchenryswcd.org

The McHenry-Lake County Soil & Water Conservation District is an equal opportunity provider and employer.

EXECUTIVE SUMMARY OF NRI REPORT #24-045-4601

It is the opinion of the McHenry-Lake County Soil and Water Conservation District Board of Directors that this report as summarized on this page is pertinent to the requested zoning change.



Groundwater Contamination Potential:

Nitrate Leachability: Maps indicate the parcel is within an area that has a limited sensitivity to nitrate leaching.

Pesticide Leachability: Maps indicate the parcel is within an area that has very limited sensitivity to pesticide leaching.

Soil Limitations (This evaluates the parcel from the surface down to approximately 5 feet.):

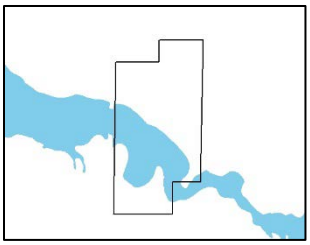
Ground Based Solar Arrays
The NRCS Soils Survey indicates 68.9% of the parcel has a very severe limitation for Soil Anchored Solar Arrays (identified in red). The reason for the ratings can be found on starting on page 18 of the report.

Erosion Ratings
The NRCS Soils Survey indicates 24.3 acres or 35.3% of the parcel contains highly erodible soils.

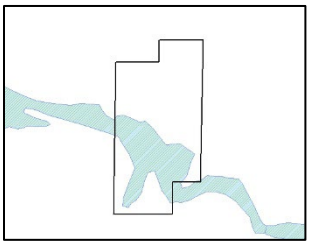
Prime Farmland Soils
The Natural Resources Conservation Service (NRCS) Soil Survey indicates 24.0 acres or 34.8% of the parcel is comprised of Prime Farmland (identified in dark green) and 24.7 acres or 35.9% of Prime when Drained Soils (identified in light green).

Hydric Soils
The NRCS Soil Survey indicates 18.3 acres or 26.6% of the parcel are comprised of hydric soils (identified in orange and red).

Floodplain Information:



The FEMA Flood Insurance Rate Map
Indicates 100-year floodplain is present on 19.38 acres of this parcel (identified in blue).



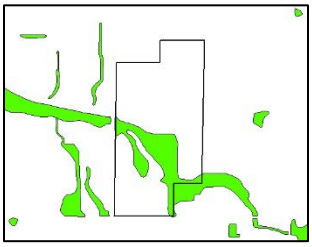
U.S. Geological Survey (USGS) Flood of Record Map (Hydrologic Atlas)
The Flood of Record Map for this area indicates 18.63 acres of the parcel has previous flooded during the 1960 flood of record on the parcel (identified in blue).

*According to the Site Layout Plan, prepared by ATWELL, dated April 16, 2024, the floodplain areas will be avoided.

Wetland Information:

USDA-NRCS Wetland Inventory
The NRCS Wetlands Inventory indicates there are no farmed wetlands on the parcel

ADID Wetland Inventory
The ADID Wetland Study indicates there are no ADID wetlands on the parcel.



Lake County Wetland Inventory
The Lake County Wetland Inventory identifies 11.04 acres of the parcel as wetland (identified in green).

*According to the Site Layout Plan, prepared by ATWELL, dated April 16, 2024, the wetland areas will be avoided..

Drainage Tile and Drainage Districts:
A review of maps identifying known field tile locations in Lake County did not identify tiles within the parcel.

Cultural Resources: None identified

Woodlands: There are east to west rows of mature trees in the northern half of the parcel, and along the stream corridor within the site. *According to the Site Layout Plan, prepared by ATWELL, dated April 16, 2024, indicates much of the east to west rows of trees will be impacted by this development.

Natural Areas: None identified

ADDITIONAL CONCERNS

The Board recommends that areas between panels and within the buffers, be planted to a native prairie mix to help increase water infiltration and reduce runoff from the site. It is recommended that a planting and maintenance plan be developed with the landowner to ensure that noxious weeds are controlled, and native plantings are properly installed and managed. The petitioner should refer to the planting requirements of the Illinois Department of Natural Resources.

We have received notification from the Illinois Department of Agriculture that an Agriculture Mitigation Agreement has been completed.

McHENRY-LAKE COUNTY SOIL AND WATER CONSERVATION DISTRICT
NATURAL RESOURCE INFORMATION REPORT (NRI)

NRI Report Number	24-045-4601
Applicant's Name	Zion Community Energy Initiative LLC
Size of Parcel	70.99 acres
Zoning Change	Ag Community Solar
Parcel Index Number(s)	03-11-200-014
Common Location	14280 West 9th St., Zion, IL
Contact Person	Keri Williams

Copies of this report or notification of the proposed land-use change were provided to:	***yes***	***no***
The Applicant		x
The Applicant's Legal Representation/Consultant	x	

Report Prepared By: *Spring M. Duffey* Position: *Executive Director*

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PURPOSE AND INTENT

The purpose of this report is to inform officials of the local governing body and other decision-makers with natural resource information. This information may be useful when undertaking land use decisions concerning variations, amendments or relief of local zoning ordinances, proposed subdivision of vacant or agricultural lands and the subsequent development of these lands. This report is a requirement under Section 22.02a of the Illinois Soil and Water Conservation Districts Act.

The intent of this report is to present the most current natural resource information available in a readily understandable manner. It contains a description of the present site conditions, the present resources, and the potential impacts that the proposed change may have on the site and its resources. The natural resource information was gathered from standardized data, on-site investigations and information furnished by the petitioner. This report must be read in its entirety so that the relationship between the natural resource factors and the proposed land use change can be fully understood.

Due to the limitations of scale encountered with the various resource maps, the property boundaries depicted in the various exhibits in this report provide a generalized representation of the property location and may not precisely reflect the legal description of the PIQ (Parcel in Question).

This report, when used properly, will provide the basis for proper land use change decisions and development while protecting the natural resource base of the county. It should not be used in place of detailed environmental and/or engineering studies that are warranted under most circumstances, but in conjunction with those studies.

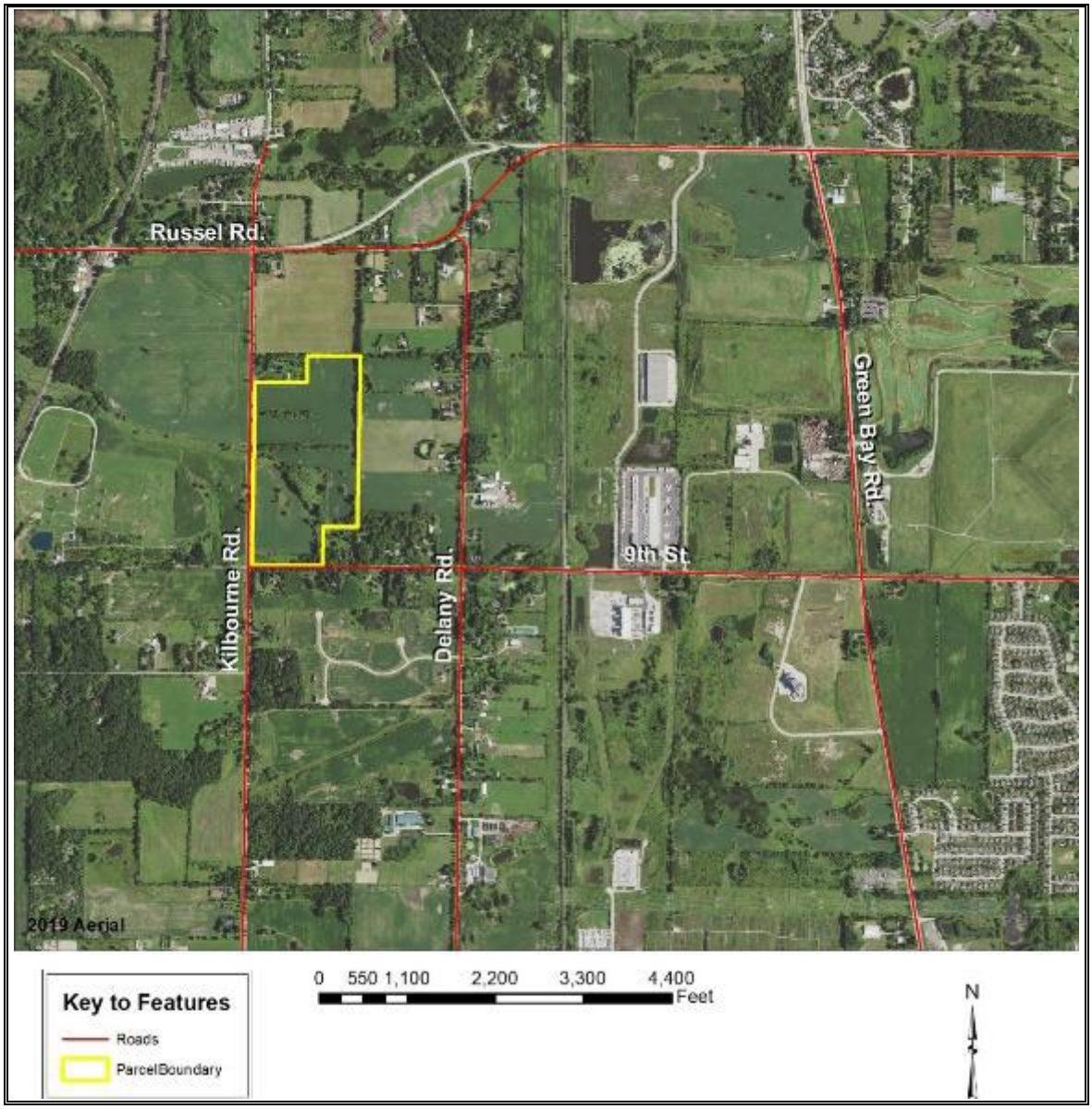
The conclusions of this report in no way indicate that a certain land use is not possible, but it should alert the reader to possible problems that may occur if the capabilities of the land are ignored. Any questions on the technical data supplied in this report or if anyone feels that they would like to see more additional specific information to make the report more effective, please contact:

McHenry-Lake County Soil & Water Conservation District
1648 S. Eastwood Dr.
Woodstock, IL 60098
Phone: (815) 338-0099 ext. 3
www.mchenryswcd.org

PARCEL LOCATION

Location Map for Natural Resources Information Report # 24-045-4601

In the Northeast Quarter of Section 11, Township 46 North, Range 11 East, on 70.99 acres. This parcel is located at the northeast intersection of Kilbourne Road and 9th Street, Lake County, IL.



ARCHAEOLOGIC/CULTURAL RESOURCES

Simply stated, cultural resources are all the past activities and accomplishments of people. They include the following: buildings; objects made or used by people; locations; and less tangible resources, such as stories, dance forms, and holiday traditions. The Soil and Water Conservation District most often encounters cultural resources as historical properties. These may be prehistoric or historical sites, buildings, structures, features, or objects. The most common type of historical property that the Soil and Water Conservation District may encounter is non-structural archaeological sites. These sites often extend below the soil surface, and must be protected against disruption by development or other earth moving activity if possible. Cultural resources are *non-renewable* because there is no way to "grow" a site to replace a disrupted site.

Those sites deemed to be significant and eligible for listing on the National Register of Historical Places are referred to as "historic properties." These may be prehistoric (before written history) or from the historic period, which in Illinois is after 1673. Anything older than 50 years needs to be evaluated for historic significance.

Landowners with historical properties on their land have ownership of that historical property. However, the State of Illinois owns all of the following: human remains, grave markers, burial mounds, and artifacts associated with graves and human remains over 100 years old.

Non-grave artifacts from archaeological sites and historical buildings are the property of the landowner. The landowner may choose to disturb a historical property, but may not receive federal or state assistance to do so. If an earth moving activity disturbs human remains, the landowner must contact the county coroner within 48 hours.

Historic Preservation Legislation: The National Historic Preservation Act of 1966 (NHPA Section 106) requires all Federal Agencies' "undertakings" to "take into account" their effect on historic properties. As of January 1, 1990, the State Agency Historic Resources Preservation Act (Public Act 86-707) requires the same for all private or public undertakings involving state agencies. An "undertaking" is defined to cover a wide range of Federal or State permitting, funding, and licensing activities. It is the responsibility of Federal/State Agencies to ensure the protection of historic resources and the State Historic Preservation Office (SHPO) regulates this effort.

The Applicant should contact the Archaeology Section, Preservation Services Division, Illinois Historic Preservation Agency, for information about compliance with Federal and State regulations at http://www.stae.il.us/hpa/.

The resource maps do not identify known cultural resources on the parcel.

ECOLOGICALLY SENSITIVE AREAS

What is Biological Diversity and Why Should it be Conserved?[1]

Biological diversity, or biodiversity, is the range of life on our planet. A more thorough definition is presented by botanist Peter H. Raven: "At the simplest level, biodiversity is the sum total of all the plants, animals, fungi and microorganisms in the world, or in a particular area; all of their individual variation; and all of the interactions between them. It is the set of living organisms that make up the fabric of the planet Earth and allow it to function as it does, by capturing energy from the sun and using it to drive all of life's processes; by forming communities of organisms that have, through the several billion years of life's history on Earth, altered the nature of the atmosphere, the soil and the water of our Planet; and by making possible the sustainability of our planet through their life activities now." (Raven 1994)

It is not known how many species occur on our planet. Presently, about 1.4 million species have been named. It has been estimated that there are perhaps 9 million more that have not been identified. What is known is that they are vanishing at an unprecedented rate. Reliable estimates show extinction occurring at a rate several orders of magnitude above "background" in some ecological systems. (Wilson 1992, Hoose 1981)

The reasons for protecting biological diversity are complex, but they fall into four major categories.

First, loss of diversity generally weakens entire natural systems. Healthy ecosystems tend to have many natural checks and balances. Every species plays a role in maintaining this system. When simplified by the loss of diversity, the system becomes more susceptible to natural and artificial perturbations. The chances of a system-wide collapse increase. In parts of the midwestem United States, for example, it was only the remnant areas of natural prairies that kept soil intact during the dust bowl years of the 1930s. (Roush 1982)

Simplified ecosystems are almost always expensive to maintain. For example, when synthetic chemicals are relied upon to control pests, the target species are not the only ones affected. Their predators are almost always killed or driven away, exasperating the pest problem. In the meantime, people are unintentionally breeding pesticide-resistant pests. A process has begun where people become perpetual guardians of the affected area, which requires the expenditure of financial resources and human ingenuity to keep the system going.

A second reason for protecting biological diversity is that it represents one of our greatest untapped resources. Great benefits can be reaped from a single species. About 20 species provide 90% of the world's food. Of these 20, just three, wheat, maize and rice-supply over one half of that food. American wheat farmers need new varieties every five to 15 years to compete with pests and diseases. Wild strains of wheat are critical genetic reservoirs for these new varieties.

Further, every species is a potential source of human medicine. In 1980, a published report identified the market value of prescription drugs from higher plants at over $3 billion. Organic alkaloids, a class of chemical compounds used in medicines, are found in an estimated 20% of plant species. Yet only 2% of plant species have been screened for these compounds. (Hoose 1981)

The third reason for protecting diversity is that humans benefit from natural areas and depend on healthy ecosystems. The natural

---

[1]Taken from *The Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities*, prepared by the Nature Conservancy Great Lakes Program 79W. Monroe Street, Suite 1309, Chicago, IL 60603, January 1994

world supplies our air, our water, our food and supports human economic activity. Further, humans are creatures that evolved in a diverse natural environment between forest and grasslands. People need to be reassured that such places remain. When people speak of "going to the country," they generally mean more than getting out of town. For reasons of their own sanity and well being, they need a holistic, organic experience. Prolonged exposure to urban monotony produces neuroses, for which cultural and natural diversity cure.

Historically, the lack of attention to biological diversity, and the ecological processes it supports, has resulted in economic hardships for segments of the basin's human population.

The final reason for protecting biological diversity is that species and natural systems are intrinsically valuable. The above reasons have focused on the benefits of the natural world to humans. All things possess intrinsic value simply because they exist.

Biological Resources Concerning the Subject Parcel

As part of the Natural Resources Information Report, staff checks office maps to determine if any nature preserves are within 500 feet of the parcel in question. If there is a nature preserve in the area, then that resource will be identified as part of the report. The SWCD recommends that every effort be made to protect that resource. Such efforts should include, but are not limited to erosion control, sediment control, stormwater management, and groundwater monitoring.

Office maps indicate there are no designated natural areas within 500 feet of the parcel.

WOODLANDS

Existing mature trees should be preserved whenever possible. Woodlands provide a large number of benefits such as wildlife habitat, erosion control, air and water quality improvements, as well as aesthetic values. Construction activities can indirectly destroy trees. Oak trees are particularly susceptible to long term, permanent damage caused by construction activities and require special consideration. It is also recommended that invasive non-native species be removed whenever possible. The petitioner is advised to consult the County or Municipal tree ordinance regarding the specific requirements for tree removal and planting.

Native woodlands are no longer a common occurrence throughout much of Lake County. Although forests originally covered nearly 40% of Illinois, today only about 12% of the state is forested, with most of this being secondary growth (Ill. Natural History Survey Reports, Nov/Dec 1993, No. 324). The composition of Illinois forests has changed markedly over the past three decades. 97% of the timberland is classified as hardwood forest. The forest acreage continues to increase from 4.2 million acres in 1985 to 4.3 million acres in 1998. (IL Forest Development Council News, IL DNR, Winter 2001/Volume 2, No. 1). Oak-hickory forests, which had made up half of the acreage, have declined by 14%, and make up 2.1 million acres. This decline is largely a result of wildfire suppression that allows maples to take over. Thus, the acres of maple-beech forest have risen more than 40-fold from 1962 to 1985, to one quarter of the total forest area, 696 thousand acres. Dutch elm disease and the conversion of forested bottomlands to agriculture have resulted in huge declines in the elm-ash-cottonwood forests, 906 thousand acres, falling from one third - one sixth of the Illinois forest area. Elm accounts for the greatest number of individual trees – 412 million. Other species groups with more than 100 million trees include hickory, red oak, sugar/black maple, ash, hackberry, and black cherry.

Woodlands provide many benefits such as wildlife habitat, erosion control, air and water quality improvements, and aesthetic values. Forests are responsible for much of the biological diversity in the state. Many species are dependent upon forests for food & shelter, including threatened/endangered species.

One of the most serious problems facing Illinois forests is the invasion of exotic plants and animals. Some of the most damaging plants includes European buckthorn, multiflora rose, honeysuckle, purple loosestrife, and garlic mustard.

Many trees, particularly hardwoods (especially oaks) are extremely sensitive to construction-induced disturbances. The area most susceptible to damage is within the "drip radius," the ground surface directly beneath the leafy canopy of the tree. Many trees have an extensive system of feeder roots, located within one foot of the surface, and supply the tree with the majority of its moisture and nutrient needs.

Construction activities can negatively impact trees in several different ways. Earth-moving activities that stockpile soil near trees can suffocate tree roots that, although buried, require oxygen. Vehicle traffic can compact the soil to a point where the roots no longer function effectively. Grading activities for road cuts and foundations can cause a localized drop in the water table, placing the trees under stress. The placement of pavement or stormwater management facilities near established trees can also radically change soil moisture. The removal of the accumulated organic materials normally present on a woodland floor, and the subsequent establishment of turf lawns, can drastically affect the soil temperature and nutrient balance. Injury to the bark of a tree can increase the chance of the tree being subjected to a potentially harmful disease.

If existing trees are to be maintained in a healthy state, the appropriate planning is necessary. Someone with a working knowledge of forestry should assess existing trees to determine which trees should be protected. Some tree species are not considered desirable due to their aggressive growth, behavior, and limited value to local wildlife. Proper management of woodlands and open space includes the selective elimination of such trees and replacement by more desirable species. **Trees that are to be saved should be marked and**

protected with snow fencing or similar material, installed around the drip radius, to prevent root damage, and vehicle traffic should be minimized around the drip line. Contractors should be informed of the intention to preserve trees and be expected to conduct their work accordingly.

Tree damage resulting from construction activities may not be apparent for a number of years. While it is recognized that some tree loss is unavoidable, this should be minimized to the extent possible. It is highly recommended that trees lost to development activity be replaced by younger specimens of the native trees now found on the PIQ.

GEOLOGIC INFORMATION

Geology and the Proposed Land Use

As density of septic systems increases, the concern for pollution potential of local groundwater rises. Local geology plays an important role in determining the pollution potential. Groundwater pollution potential is an important factor when determining a specific area's suitability for a given land use. The local geology, is an important element of the natural resource base. This information, when compared to soils information, gives a clearer picture of conditions on this parcel.

The groundwater in thin sand and gravel deposits is not commonly tapped for water resources; however, contaminated groundwater may flow into aquifers of adjoining units, or it may migrate through the sand and gravel, especially along the contact with underlying fine-grained deposits, and discharge on slopes or into surface-water bodies. The fine-grained materials (10-50 feet thick, offer moderate protection for underlying aquifers from waste spreading or septic systems. Burial Aquifers are aquifers overlain by 10 feet or more of fine-grained deposits.

Section 11

Burial Sand and Gravel Aquifers

Key:

Green – Good to excellent aquifers, 50 to more than 100 ft. of sand & gravel reported

Yellow – Fair to poor aquifers, 15-50 ft. of sand and gravel reported.

Pink – Poor aquifers and non-aquifers, less than 15 ft. of sand and gravel reported.

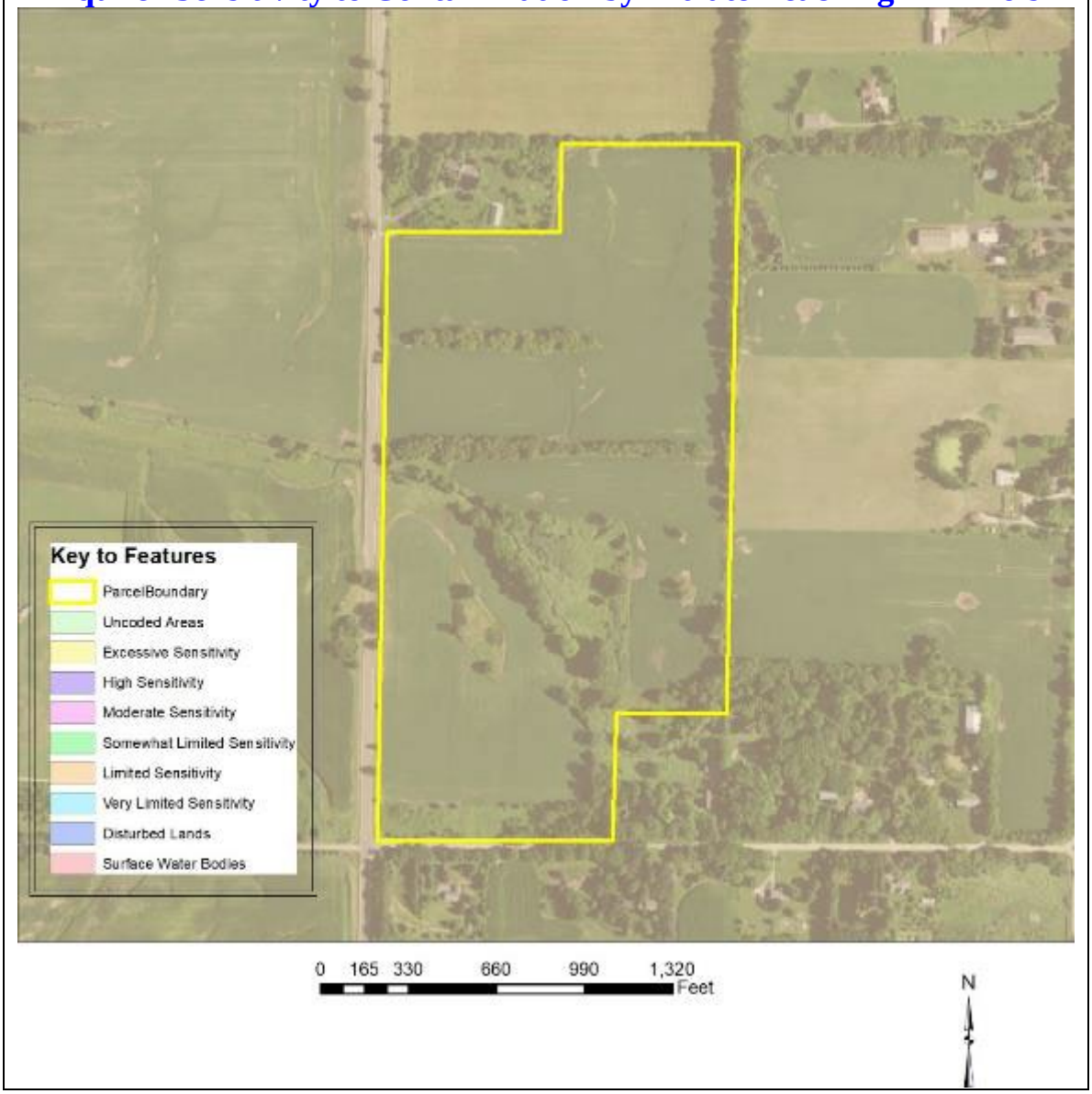
Aquifer Sensitivity to Contamination by Nitrate and Pesticide Leaching

(Information from Illinois State Geologic Survey Environmental Geology Report 148)

Purpose:

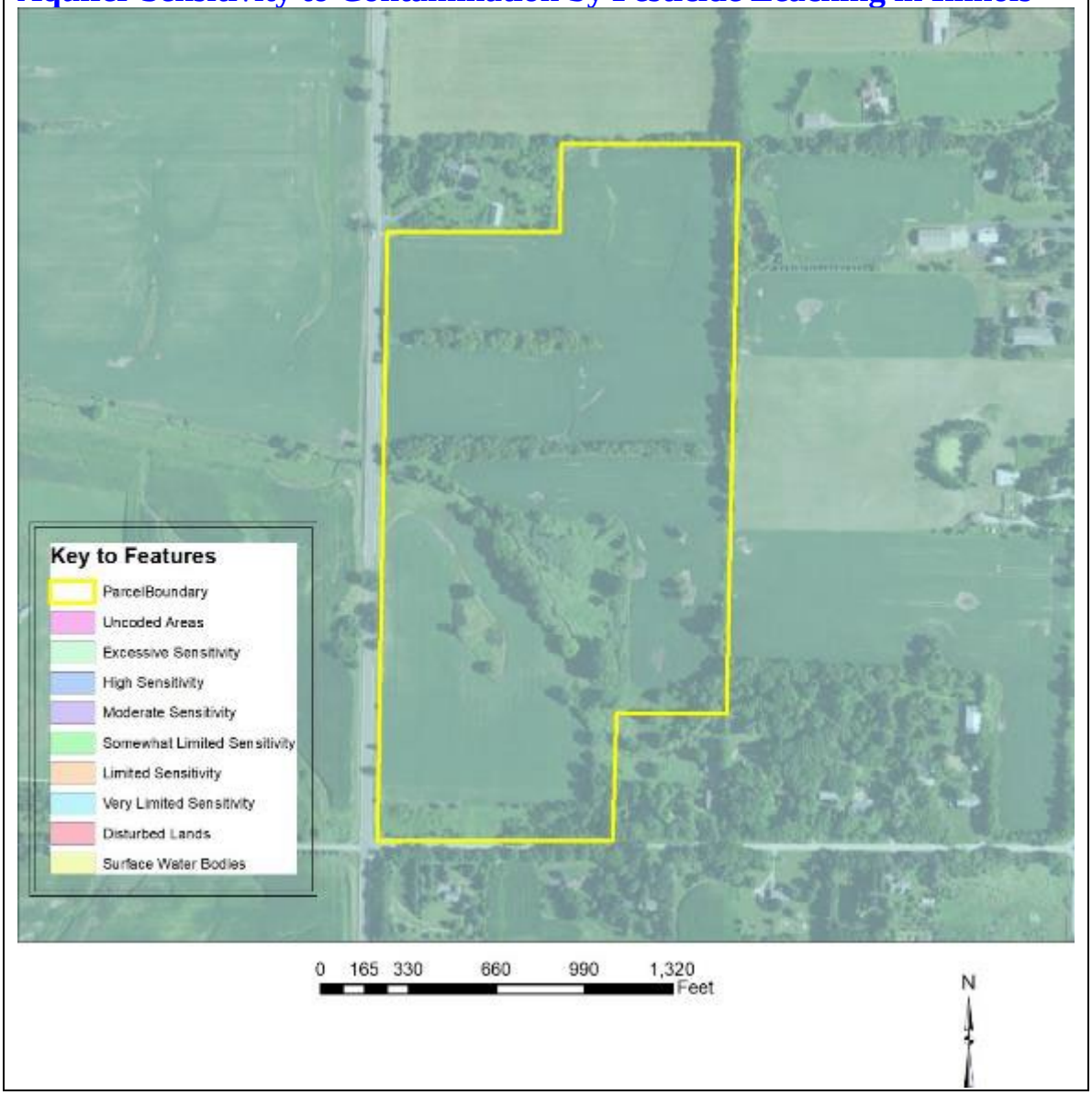
This data set was designed for statewide evaluation of agrichemical leaching characteristics and associated aquifer sensitivity to contamination. It was created to classify soils and aquifer settings according to predictions of leaching potential. The classifications have not been validated by the results of water quality sampling. Accordingly, the reliability of these aquifer sensitivity ratings as predictors of water quality has not been evaluated.

Aquifer Sensitivity to Contamination by Nitrate Leaching in Illinois



The map indicates the parcel is within a Limited Sensitivity to Nitrate Leaching area.

Aquifer Sensitivity to Contamination by Pesticide Leaching in Illinois



The map indicates the parcel has a very limited sensitivity to pesticide leaching.

SOILS INFORMATION

Importance of Soils Information

Soils information comes from Natural Resources Conservation Service Soil Maps and Descriptions for Lake County. This information is important to all parties involved in determining the suitability of the proposed land use change.

Each soil polygon is given a number, which represents its soil type. The letter found after the soil type number indicates the soils slope class.

Each soil map unit has limitations for a variety of land uses such as septic systems, buildings with basements, and buildings without basements. It is important to remember that soils do not function independently of each other. The behavior of a soil depends upon the physical properties of adjacent soil types, the presence of artificial drainage, soil compaction, and its position in the local landscape.

The limitation categories (slight, moderate or severe) indicate the potential for difficulty in using that soil unit for the proposed activity and, thus, the degree of need for thorough soil borings and engineering studies. A limitation does not necessarily mean that the proposed activity cannot be done on that soil type. It does mean that the reasons for the limitation need to be thoroughly understood and dealt with in order to complete the proposed activity successfully. A severe limitation indicates that the proposed activity will be more difficult and costly to do on that soil type than on a soil type with a moderate or slight rating.

Soil survey interpretations are predictions of soil behavior for specified land uses and specified management practices. They are based on the soil properties that directly influence the specified use of the soil. Soil survey interpretations allow users of soil surveys to plan reasonable alternatives for the use and management of soils.

Soil interpretations do not eliminate the need for on-site study and testing of specific sites for the design and construction for specific uses. They can be used as a guide for planning more detailed investigations and for avoiding undesirable sites for an intended use. The scale of the maps and the range of error limit the use of the soil delineations.

Soil Map—Lake County, Illinois
(ParcelBoundary)

Soil Map Unit Descriptions

Map Unit Symbol	Map Unit Name	Acres	Percent
153A	Pella silty clay loam, 0 to 2 percent slopes	16.6	24.2%
232A	Ashkum silty clay loam, 0 to 2 percent slopes	0.2	0.3%
298B	Beecher silt loam, 2 to 4 percent slopes	0.2	0.2%
327A	Fox silt loam, 0 to 2 percent slopes	1.2	1.8%
327B	Fox silt loam, 2 to 4 percent slopes	0.8	1.2%
330A	Peotone silty clay loam, 0 to 2 percent slopes	1.5	2.1%
530B	Ozaukee silt loam, 2 to 4 percent slopes	5.6	8.1%
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	4.1	6.0%
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	9.7	14.1%
697A	Wauconda silt loam, 0 to 2 percent slopes	6.4	9.3%
698B	Grays silt loam, 2 to 4 percent slopes	10.2	14.7%
840C2	Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded	10.5	15.2%
979B	Grays and Markham silt loams, 2 to 4 percent slopes	1.9	2.8%
Totals		**68.9**	**100.0%**

Soil Interpretations Explanation

Nonagricultural

General

These interpretative ratings help engineers, planners, and others to understand how soil properties influence behavior when used for nonagricultural uses such as building site development or construction materials. This report gives ratings for proposed uses in terms of limitations and restrictive features. The tables list only the most restrictive features. Other features may need treatment to overcome soil limitations for a specific purpose.

Ratings come from the soil's "natural" state, that is, no unusual modification occurs other than that which is considered normal practice for the rated use. Even though soils may have limitations, an engineer may alter soil features or adjust building plans for a structure to compensate for most degrees of limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs for site preparation and maintenance.

Soil properties influence development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Soil limitation ratings of slight, moderate, and severe are given for the types of proposed improvements that are listed or inferred by the petitioner as entered on the report application and/or zoning petition. The most common types of building limitation that this report gives limitations ratings for is: septic systems. It is understood that engineering practices can overcome most limitations for buildings with and without basements, and small commercial buildings. Limitation ratings for these types of buildings are not commonly provided. Organic soils, when present on the parcel, are referenced in the hydric soils section of the report. This type of soil is considered to be unsuitable for all types of construction.

Limitations Ratings

1. ***Slight*** - This soil has favorable properties for the use. The degree of limitation is minor. The people involved can expect good performance and low maintenance.
2. ***Moderate*** - This soil has moderately favorable properties for the use. Special planning, design, or maintenance can overcome this degree of limitation. During some part of the year, the expected performance is less desirable than for soils rated slight.
3. ***Severe or Very Severe***- This soil has one or more properties that are unfavorable for the rated use. These may include the following: steep slopes, bedrock near the surface, flooding, high shrink-swell potential, a seasonal high water table, or low strength. This degree of limitation generally requires major soil reclamation, special design, or intensive maintenance, which in most situations is difficult and costly.

GROUND-BASED SOLAR ARRAYS, SOIL-PENETRATING ANCHOR SYSTEMS

Description

Ground-based solar arrays are sets of photovoltaic panels that are not situated on a building or pole. These installations consist of a racking system that holds the panel in the desired orientation and the foundation structures that hold the racking system to the ground. Two basic methods are used to hold the systems to the ground, based on site conditions and cost. One method employs driven piles, screw augers, or concrete piers that penetrate into the soil to provide a stable foundation. The ease of installation and general site suitability of soil-penetrating anchoring systems depends on soil characteristics such as rock fragment content, soil depth, soil strength, soil corrosivity, shrink-swell tendencies, and drainage. The other basic anchoring system utilizes precast ballasted footings or ballasted trays on the soil surface to make the arrays too heavy to move. The site considerations that impact both basic systems are slope, slope aspect, wind speed, land surface shape, flooding, and ponding. Other factors that will contribute to the function of a solar power array include daily hours of sunlight and shading from hills, trees or buildings.

Soil-penetrating anchoring systems can be used where the soil conditions are not limited. Installation of these systems requires some power equipment for hauling components and either driving piles, turning helices, or boring holes to install the anchoring apparatus.

Soils can be a non-member, partial member or complete members of the set of soils that are limited for "Ground-based Solar Panel Arrays". If a soil's property within 150 cm (60 inches) of the soil surface has a membership indices greater than zero, then that soil property is limiting and the soil restrictive feature is identified. The overall interpretive rating assigned is the maximum membership indices of each soil interpretive property that comprise the "Ground-based Solar Panel Array" interpretive rule. Minor restrictive soil features are identified but not considered as part of the overall rating process. These restrictive features could be important factors where the major restrictive features are overcome through design application.

Soils are placed into interpretive rating classes per their rating indices. These are not limited (rating index = 0), somewhat limited (rating index greater than 0 and less than 1.0), or very limited (rating index = 1.0).

Numerical ratings indicate the degree of limitation. The ratings are shown in decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil has the least similarity to a good site (1.00) and the point at which the soil feature is very much like known good sites (0).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

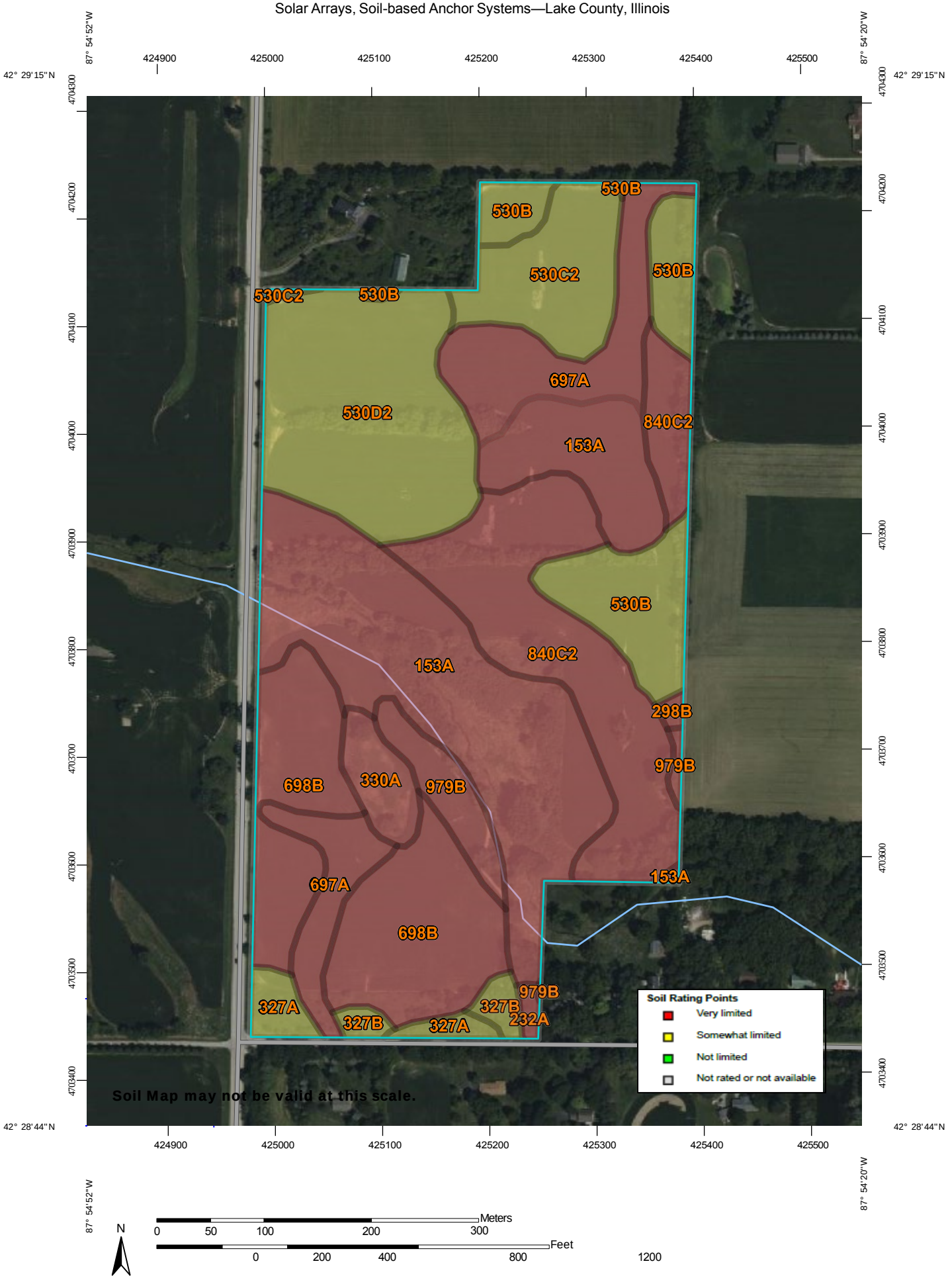
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

References:

Canada, S. 2012. Corrosion impacts on steel piles. Solarpro. Solarprofessional.com.

Romanoff, Melvin. 1962. Corrosion of Steel Pilings in Soils. Journal of Research of the National Bureau of Standards. (Volume 66C, No. 3). July/September, 1962.

Solar Arrays, Soil-based Anchor Systems—Lake County, Illinois



Solar Arrays, Soil-based Anchor Systems

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres	Percent
153A	Pella silty clay loam, 0 to 2 percent slopes	Very limited	Pella, drained (96%)	Ponding (1.00)	16.6	24.2%
				epth to saturated zone (1.00)		
				ost action (1.00)		
				w strength (0.80)		
				eel corrosion (0.75)		
			Harpster, drained (3%)	Ponding (1.00)		
				epth to saturated zone (1.00)		
				ost action (1.00)		
				w strength (1.00)		
				eel corrosion (0.75)		
232A	Ashkum silty clay loam, 0 to 2 percent slopes	Very limited	Ashkum, drained (92%)	Ponding (1.00)	0.2	0.3%
				epth to saturated zone (1.00)		
				rink-swell (1.00)		
				ost action (1.00)		
				w strength (1.00)		
			Peotone, drained (5%)	Ponding (1.00)		
				epth to saturated zone (1.00)		
				rink-swell (1.00)		
				ost action (1.00)		
				w strength (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres	Percent
			Orthents, clayey (2%)	rink-swell (1.00)		
				w strength (1.00)		
				eel corrosion (0.75)		
				ost action (0.50)		
				lslope position (0.25)		
298B	Beecher silt loam, 2 to 4 percent slopes	Very limited	Beecher (90%)	ost action (1.00)	0.2	0.2%
				w strength (1.00)		
				pth to saturated zone (0.99)		
				eel corrosion (0.75)		
				lslope position (0.13)		
			Ashkum, drained (6%)	Ponding (1.00)		
				pth to saturated zone (1.00)		
				rink-swell (1.00)		
				ost action (1.00)		
				w strength (1.00)		
			Orthents, clayey (2%)	rink-swell (1.00)		
				w strength (1.00)		
				eel corrosion (0.75)		
				ost action (0.50)		
				lslope position (0.25)		
327A	Fox silt loam, 0 to 2 percent slopes	Somewhat limited	Fox (90%)	eel corrosion (0.75)	1.2	1.8%
				ost action (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres	Percent
				llslope position (0.25)		
				rink-swell (0.16)		
				w strength (0.01)		
327B	Fox silt loam, 2 to 4 percent slopes	Somewhat limited	Fox (90%)	eel corrosion (0.75)	0.8	1.2%
				ost action (0.50)		
				llslope position (0.25)		
				ope shape across (0.20)		
			Casco (5%)	eel corrosion (0.75)		
				ost action (0.50)		
				llslope position (0.25)		
330A	Peotone silty clay loam, 0 to 2 percent slopes	Very limited	Peotone, drained (95%)	Ponding (1.00)	1.5	2.1%
				epth to saturated zone (1.00)		
				rink-swell (1.00)		
				ost action (1.00)		
				w strength (1.00)		
530B	Ozaukee silt loam, 2 to 4 percent slopes	Somewhat limited	Ozaukee (94%)	eel corrosion (0.75)	5.6	8.1%
				ost action (0.50)		
				w strength (0.41)		
				llslope position (0.25)		
				ope shape across (0.20)		
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	Somewhat limited	Ozaukee, eroded (96%)	eel corrosion (0.75)	4.1	6.0%
				ost action (0.50)		
				w strength (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres	Percent
				lslope position (0.13)		
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	Somewhat limited	Ozaukee, eroded (93%)	eel corrosion (0.75)	9.7	14.1%
				ost action (0.50)		
				w strength (0.48)		
				lslope position (0.13)		
				Slope (0.04)		
			Ozaukee, severely eroded (2%)	eel corrosion (0.75)		
				ost action (0.50)		
				w strength (0.25)		
				lslope position (0.13)		
				Slope (0.04)		
697A	Wauconda silt loam, 0 to 2 percent slopes	Very limited	Wauconda (92%)	ost action (1.00)	6.4	9.3%
				pth to saturated zone (0.94)		
				eel corrosion (0.75)		
				w strength (0.61)		
				lslope position (0.25)		
			Pella (2%)	Ponding (1.00)		
				pth to saturated zone (1.00)		
				ost action (1.00)		
				w strength (0.98)		
				eel corrosion (0.75)		
			Drummer (2%)	Ponding (1.00)		
				pth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres	Percent
				ost action (1.00)		
				w strength (1.00)		
				eel corrosion (0.75)		
698B	Grays silt loam, 2 to 4 percent slopes	Very limited	Grays (92%)	ost action (1.00)	10.2	14.7%
				w strength (0.89)		
				eel corrosion (0.75)		
				lslope position (0.25)		
				ope shape across (0.20)		
			Pella (2%)	Ponding (1.00)		
				epth to saturated zone (1.00)		
				ost action (1.00)		
				w strength (0.98)		
				eel corrosion (0.75)		
			Drummer (2%)	Ponding (1.00)		
				epth to saturated zone (1.00)		
				ost action (1.00)		
				w strength (1.00)		
				eel corrosion (0.75)		
840C2	Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded	Very limited	Zurich (46%)	ost action (1.00)	10.5	15.2%
				eel corrosion (0.75)		
				w strength (0.62)		
				lslope position (0.13)		
				rink-swell (0.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Ozaukee (45%)	w strength (1.00)		
				eel corrosion (0.75)		
				ost action (0.50)		
				llslope position (0.50)		
				epth to saturated zone (0.08)		
979B	Grays and Markham silt loams, 2 to 4 percent slopes	Very limited	Grays (46%)	ost action (1.00)	1.9	2.8%
				w strength (0.93)		
				eel corrosion (0.75)		
				llslope position (0.25)		
				rink-swell (0.15)		
Totals for Area of Interest					**68.9**	**100.0%**

Rating	Acres	Percent
Very limited	47.4	68.9%
Somewhat limited	21.4	31.1%

SOIL EROSION & SEDIMENT CONTROL

Erosion is the wearing away of the soil by water, wind, and other forces. Soil erosion threatens the Nation's soil productivity and contributes the most pollutants in our waterways. Water causes about two thirds of erosion on agricultural land. Four properties, mainly, determine a soil's erodibility:

1. Texture 2. Slope 3. Structure
4. Organic matter content

Slope has the most influence on soil erosion potential when the site is under construction. Erosivity and runoff increase as slope grade increases. The runoff then exerts more force on the particles, breaking their bonds more readily and carrying them farther before deposition. The longer water flows along a slope before reaching a major waterway, the greater the potential for erosion.

Soil erosion during and after this proposed construction can be a primary non-point source of water pollution. Eroded soil during the construction phase can create unsafe conditions on roadways, decrease the storage capacity of lakes, clog streams and drainage channels, cause deterioration of aquatic habitats, and increase water treatment costs. Soil erosion also increases the risk of flooding by choking culverts, ditches and storm sewers, and by reducing the capacity of natural and man-made detention facilities.

The general principles of erosion and sedimentation control measures include:

- reducing or diverting flow from exposed areas, storing flows or limiting runoff from exposed areas,
- staging construction in order to keep disturbed areas to a minimum,
- establishing or maintaining or temporary or permanent groundcover,
- retaining sediment on site and
- properly installing, inspecting and maintaining control measures.

<u>Erosion control practices are useful controls only if they are properly located, installed, inspected and maintained</u>.

Under the Watershed Development Ordinance of the Lake County Stormwater Management Commission, soil erosion and sedimentation control measures are required for any land disturbance. The following has to be met:

1. Any soil disturbance must be constructed in a way that will minimize any erosion.
2. Adjoining properties and channels need to be protected from erosion and sedimentation.
3. Soil erosion and sedimentation control measures need to be constructed prior to hydrologic disturbance.
4. The disturbed areas need to be protected with temporary (needs to be removed within 30 days after final site stabilization is achieved) or permanent measures within fourteen days following the end of hydrologic disturbance or redisturbance.
5. Land disturbance activities in streams need to be avoided.
6. Soil erosion and sedimentation control measures need to be appropriate in regard to the amount of tributary drainage areas.
7. All storm sewers that are functioning during construction need to be protected.
8. A stabilized construction entrance is required with the proper filter mat.
9. Embankments need to be constructed with side slopes no steeper than 3H:1V.
10. Stormwater conveyance channels and their outlets/pipes need to be designed and constructed (within 48 hours) to withstand the expected flow velocity from the 10-year frequency storm without erosion.
11. Temporary diversions need to be constructed to direct all runoff from the hydrologically disturbed areas to the appropriate sediment trap or basin.
12. Soil stockpiles shall not be located in a floodprone or buffer area, and should not erode.

This plan must go beyond the installation of silt fences. It should include provisions for soil stabilization and runoff control throughout the entire site and the entire construction process.

It has been shown that erosion on an active construction site is typically 20-200 times greater than that on a farm field. Sediment is one of the single largest pollutants facing waterways and wetlands in the urban metropolitan area. Soil

erosion and sediment deposition can adversely affect the existing natural drainageways, causing changes in the hydrologic flow and degradation of water quality in the area. For any development, it is imperative that a comprehensive SESC plan be developed and implemented properly. The wetland complex on-site and downstream may be at particular risk of degradation if a SESC plan is not in place.

Please refer to the SESC section located in the appendix of this report for site-specific recommendations and practices. Feel free to contact our office with any questions or for more specific guidance in this area.

Highly Erodible Land (HEL)

Map Unit Symbol	Slope	HEL	Acres	Percent
153A	0 to 2 percent slopes	No	16.6	24.2%
232A	0 to 2 percent slopes	No	0.2	0.3%
298B	2 to 4 percent slopes	No	0.2	0.2%
327A	0 to 2 percent slopes	No	1.2	1.8%
327B	2 to 4 percent slopes	No	0.8	1.2%
330A	0 to 2 percent slopes	No	1.5	2.1%
530B	2 to 4 percent slopes	No	5.6	8.1%
530C2	4 to 6 percent slopes, eroded	Yes	4.1	6.0%
530D2	6 to 12 percent slopes, eroded	Yes	9.7	14.1%
697A	0 to 2 percent slopes	No	6.4	9.3%
698B	2 to 4 percent slopes	No	10.2	14.7%
840C2	4 to 6 percent slopes, eroded	Yes	10.5	15.2%
979B	2 to 4 percent slopes	No	1.9	2.8%
Total HEL			**24.3**	**35.3%**

PRIME FARMLAND SOILS

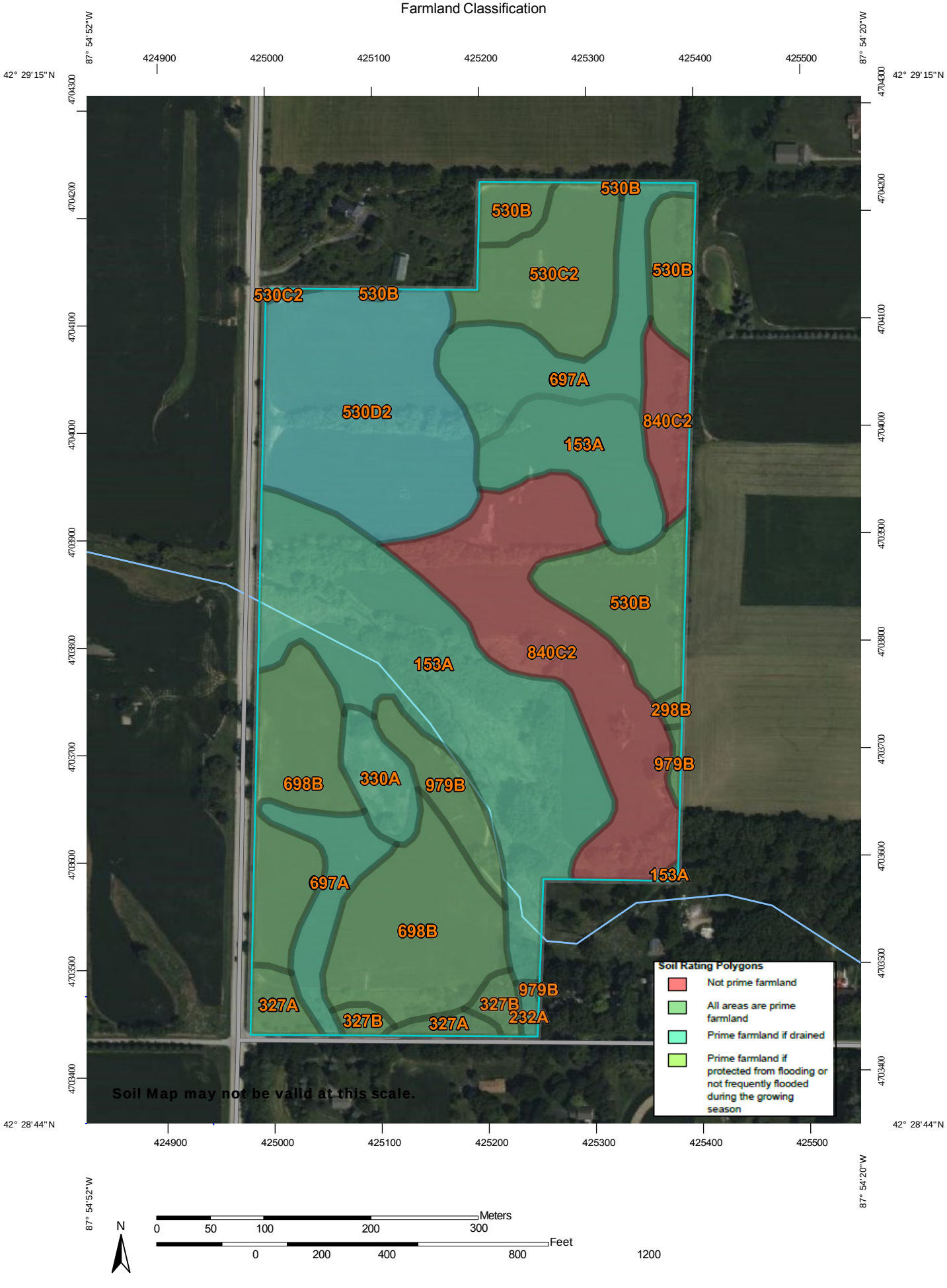
Prime farmland soils are an important resource. Some of the most productive soils in the United States occur locally. Each soil map unit in the United States is assigned a prime or non-prime rating. Prime agricultural land does not need to be in the production of food & fiber.

Section 310 of the NRCS general manual states that urban or built-up land on prime farmland soils is not prime farmland. The percentages of soils map units on the parcel reflect the determination that urban or built up land on prime farmland soils is not prime farmland.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres	Percent
153A	Pella silty clay loam, 0 to 2 percent slopes	Prime farmland if drained	16.6	24.2%
232A	Ashkum silty clay loam, 0 to 2 percent slopes	Prime farmland if drained	0.2	0.3%
298B	Beecher silt loam, 2 to 4 percent slopes	All areas are prime farmland	0.2	0.2%
327A	Fox silt loam, 0 to 2 percent slopes	All areas are prime farmland	1.2	1.8%
327B	Fox silt loam, 2 to 4 percent slopes	All areas are prime farmland	0.8	1.2%
330A	Peotone silty clay loam, 0 to 2 percent slopes	Prime farmland if drained	1.5	2.1%
530B	Ozaukee silt loam, 2 to 4 percent slopes	All areas are prime farmland	5.6	8.1%
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	All areas are prime farmland	4.1	6.0%
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	Farmland of statewide importance	9.7	14.1%
697A	Wauconda silt loam, 0 to 2 percent slopes	Prime farmland if drained	6.4	9.3%
698B	Grays silt loam, 2 to 4 percent slopes	All areas are prime farmland	10.2	14.7%
840C2	Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded	Not prime farmland	10.5	15.2%
979B	Grays and Markham silt loams, 2 to 4 percent slopes	All areas are prime farmland	1.9	2.8%
Total Prime Farmland			**24.0**	**34.8%**
Total Prime Farmland if Drained			**24.7**	**35.9%**
Total Farmland of Statewide Importance			**9.7**	**14.1%**

Farmland Classification



Hydric Soils

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field.

These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States. Federal Register. September 18, 2002. Hydric soils of the United States.

Soils information gives another indication of flooding potential. The soils map on this page indicates the soil(s) on the parcel that the Natural Resources Conservation Service indicates as hydric. Hydric soils by definition have seasonal high water at or near the soil surface and/or have potential flooding or ponding problems. All hydric soils range from poorly suited to unsuitable for building. One group of the hydric soils, are the organic soils, which formed from dead organic material. Organic soils are unsuitable for building because of not only the high water table, but also their subsidence problems.

It is also important to add the possibility of hydric inclusions in a soil type. An inclusion is a soil polygon that is too small to appear on these maps. While relatively insignificant for agricultural use, hydric soil inclusions become more important to more intense uses such as a residential subdivision.
While considering hydric soils and hydric inclusions, it is noteworthy to mention that subsurface agriculture drainage tile occurs in almost all poorly drained and somewhat poorly drained soils. Drainage tile expedites drainage and facilitates farming. It is imperative that these drainage tiles remain undisturbed. A damaged subsurface drainage tile may return original hydrologic conditions to all of the areas that drained through the tile (ranging from less than one acre to many square miles.)

For an intense land use, such as a subdivision, the McHenry County SWCD recommends the following:

1. A topographical survey with 1 foot contour intervals to accurately define the flood area on the parcel.
2. An intensive soil survey to define most accurately the locations of the hydric soils and inclusions
3. A drainage tile survey on the area to locate the tiles that must be preserved.

In general, the District does not recommend building on hydric soils because of the unfavorable properties they exhibit and because of their long term, negative effects on the structures built.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres	Percent
153A	Pella silty clay loam, 0 to 2 percent slopes	99 - Hydric	16.6	24.2%
232A	Ashkum silty clay loam, 0 to 2 percent slopes	97 - Hydric	0.2	0.3%
298B	Beecher silt loam, 2 to 4 percent slopes	6	0.2	0.2%
327A	Fox silt loam, 0 to 2 percent slopes	0	1.2	1.8%
327B	Fox silt loam, 2 to 4 percent slopes	0	0.8	1.2%
330A	Peotone silty clay loam, 0 to 2 percent slopes	100 - Hydric	1.5	2.1%
530B	Ozaukee silt loam, 2 to 4 percent slopes	4	5.6	8.1%
530C2	Ozaukee silt loam, 4 to 6 percent slopes, eroded	0	4.1	6.0%
530D2	Ozaukee silt loam, 6 to 12 percent slopes, eroded	0	9.7	14.1%
697A	Wauconda silt loam, 0 to 2 percent slopes	4	6.4	9.3%
698B	Grays silt loam, 2 to 4 percent slopes	4	10.2	14.7%
840C2	Zurich and Ozaukee silt loams, 4 to 6 percent slopes, eroded	0	10.5	15.2%
979B	Grays and Markham silt loams, 2 to 4 percent slopes	0	1.9	2.8%
Total Hydric Soils			**18.3**	**26.6%**

Hydric Rating by Map Unit
87° 54'52"W
87° 54'20"W
424900
425000
425100
425200
425300
425400
425500
42° 29'15"N
42° 28'44"N
4704300
4704200
4703500
4703400
530B
530C2
530D2
697A
840C2
153A
298B
979B
698B
330A
327A
327B
232A
Soil Rating Polygons
Hydric (100%)
Hydric (66 to 99%)
Hydric (33 to 65%)
Hydric (1 to 32%)
Not Hydric (0%)
Not rated or not available
Soil Map may not be valid at this scale.
N
0
50
100
200
300
Meters
Feet

Field Tile Map: A check of the map of known field tiles, did not identified field tiles within the boundary of the parcel.

DRAINAGE, RUNOFF AND FLOOD INFORMATION

Importance of Flood Information

A floodplain is defined as land adjoining a watercourse (riverine) or an inland depression (non-riverine) that is subject to periodic inundation by high water. Floodplains are important areas demanding protection since they have water storage and conveyance functions which affect upstream and down stream flows, water quality and quantity, and suitability of the land for human activity. Since floodplains play distinct and vital roles in the hydrologic cycle, development that interferes with their hydrologic and biologic functions should be carefully considered.

Flooding is both dangerous to people and destructive to their properties. The following maps, when combined with wetland and topographic information, can help developers and future homeowners to "sidestep" potential flooding or ponding problems.

FIRM is the acronym for the Flood Insurance Rate Map, produced by the Federal Emergency Management Agency. These maps define flood elevation adjacent to tributaries and major bodies of water, and superimpose that onto a simplified USGS topographic map. The scale of the FIRM maps is generally dependent on the size and density of parcels in that area. (This is to correctly determine the parcel location and flood plain location.) The FIRM map has three (3) zones. A is the zone of 100 year flood, zone B is the 100 to 500 year flood, and zone C is outside the flood plain.

The Hydrologic Atlas (H.A.) Series of the Flood of Record Map is also used for the topographic information. This map is different from the FIRM map mainly because it will show isolated, or pocketed flooded areas. The Flood of Record maps, show the areas of flood for various years. Both of these maps stress that the recurrence of flooding is merely statistical. That is to say a 100-year flood may occur twice in one year, or twice in one week, for that matter.

It should be noted that greater floods than those shown on the two maps are possible. The flood boundaries indicated provide a historic record only until the map publication date. Additionally, these flood boundaries are a function of the watershed conditions existing when the maps were produced. Cumulative changes in runoff characteristics caused by urbanization can result in an increase in flood height of future flood episodes.

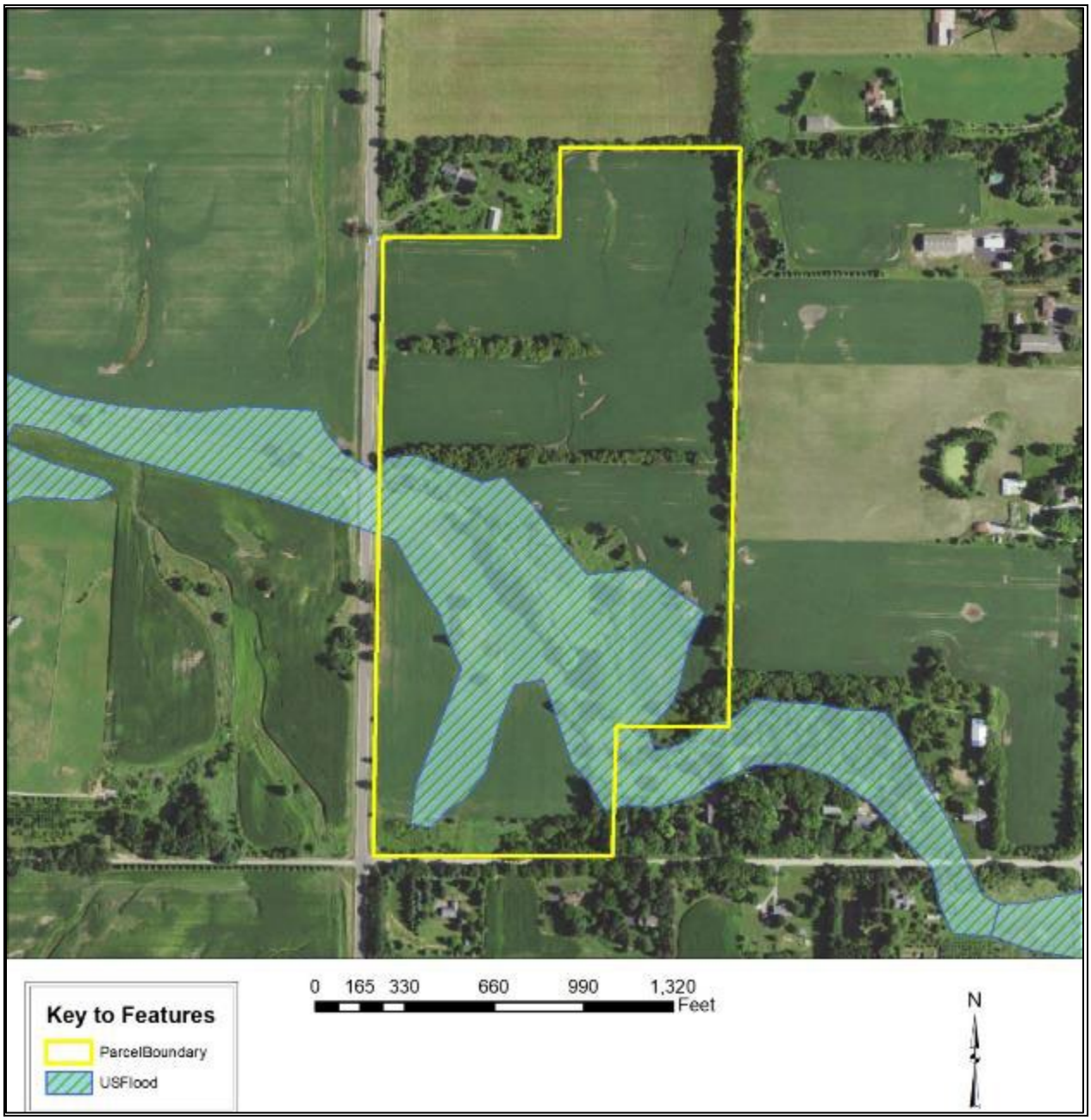
Floodplains play a vital role in reducing the flood damage potential associated with an urbanizing area and, when left in an undisturbed state, also provide valuable wildlife habitat benefits. If it is the petitioner's intent to conduct floodplain filling or modification activities, the petitioner and the Unit of Government responsible need to consider the potentially adverse effects this type of action could have on adjacent properties. The change or loss of natural floodplain storage often increases the frequency and severity of flooding on adjacent property.

It is the policy of the Board to recommend against any construction within/neighboring a floodplain in the interest of preserving natural floodplain capacity and to insure that flooding problems are not magnified in Lake County.

If the available maps indicate the presence of a floodplain on the PIQ, the petitioner should contact the IDOT-DWR and FEMA to delineate a floodplain elevation for the parcel. If a portion of the property is indeed floodplain, applicable state, county and local regulations will need to be reflected in the site plans.

Another indication of flooding potential can be found in the soils information. Hydric soils indicate the presence of drainageways, areas subject to ponding, or a naturally occurring high water table. These need to be considered along with the floodplain information when developing the site plan and the stormwater management plan. If the site does include these hydric soils

and development occurs, thus raising the concerns of the loss of water storage in these soils and the potential for increased flooding in the area.



USGS Flood of Record Map
This parcel is located on rolling topography (slopes 0 to 12%) involving high and low areas (elevation ranges from 668’ above sea level to 718’ above sea level).
During construction, temporary vegetation can decrease erosion on the slopes if the area is to be mass graded.
Also, the flood of record for this area indicates previous flooding on 18.63 acres of the parcel.

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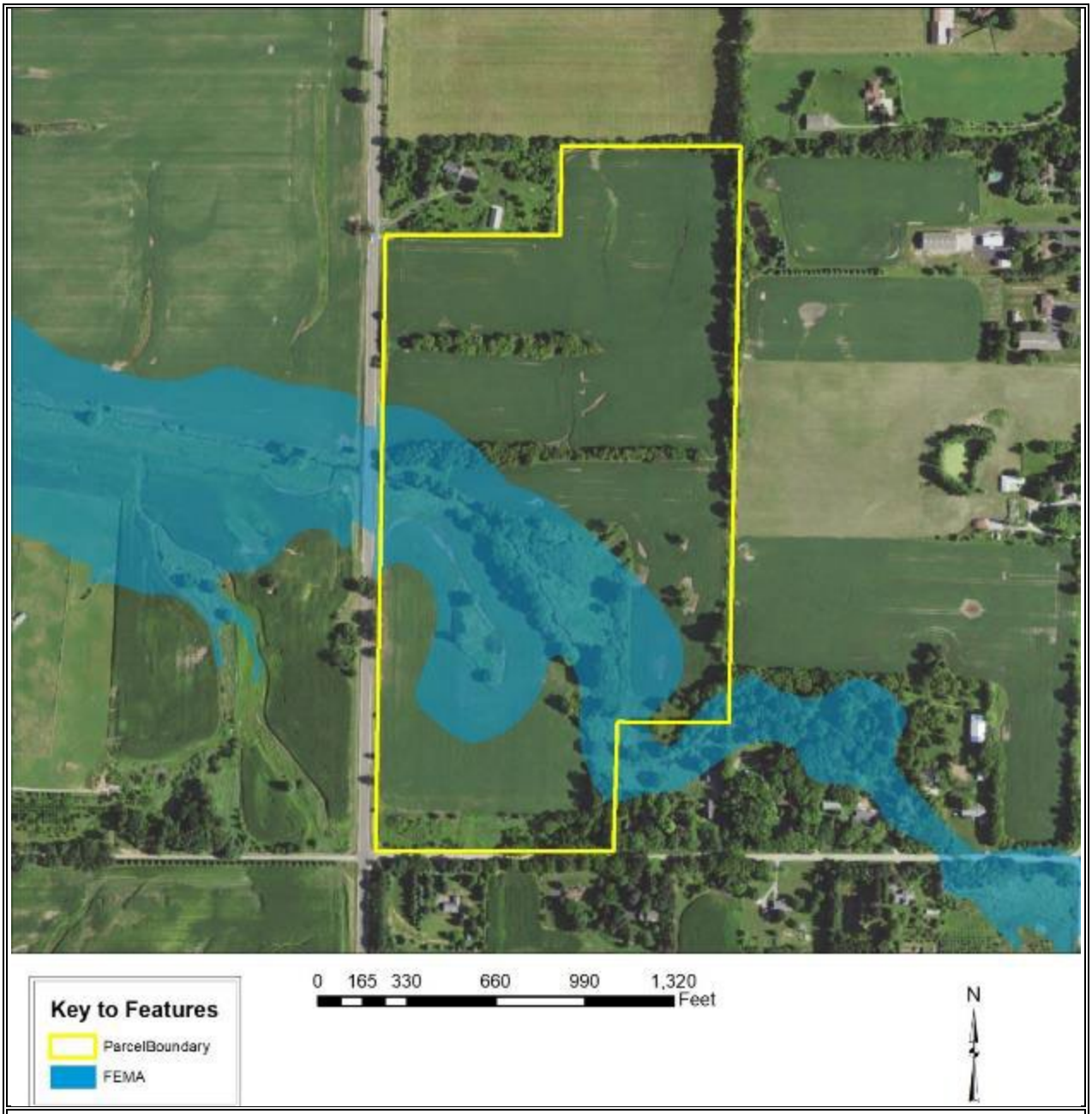


Federal Emergency Management Agency: Flood Insurance Rate Map Panel 17097C0056K

The map indicates 19.38 acres of 100-year floodplain on the parcel.

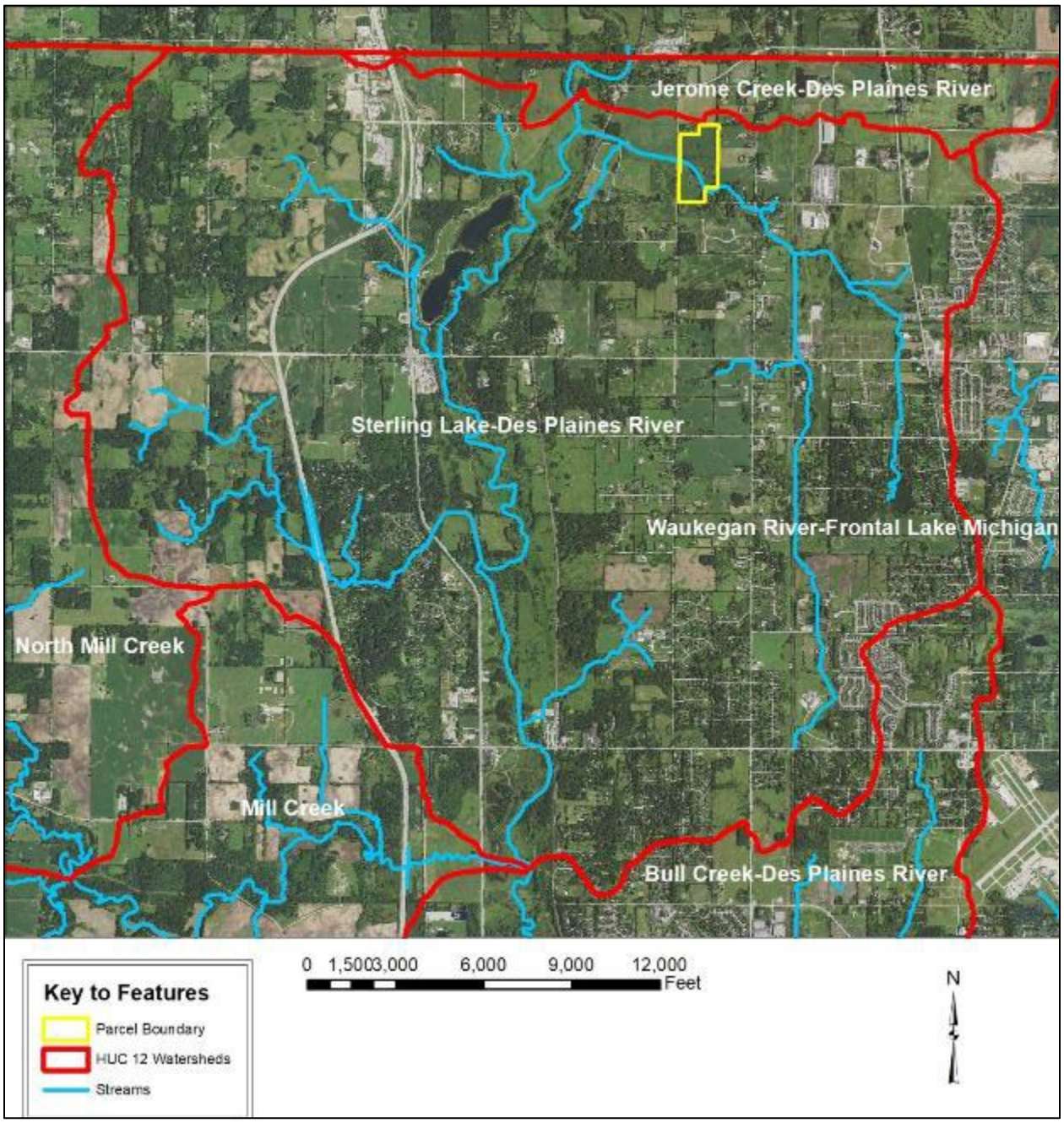
WATERSHED PLANS

What is a watershed?

No matter where you live, you live in a watershed. A watershed is the area of land that contributes/drains water to a certain point/ to a single body of water, based on the topography of the surrounding area, such as a stream, lake, wetland, or estuary. Natural events and human activities affect the watershed it lies within and even surrounding watershed areas. There are many activities that impact watersheds: recreation & tourism, water uses and transfers, forestry, agriculture, waste disposal, transportation, power generation, industrial discharges, urbanization, and resource extraction. There are many resulting threats from these impacts, such as, habitat loss and degradation, water quality and flow modification, chemical pollutants, nutrients, sediments, pathogens, invasive species, and thermal modification. In Lake County, there is a 10 to >25 percent of waters threatened within watersheds, divided by the total number of water miles in those watersheds. This information above was gathered from the U.S. Environmental Protection Agency's "Protecting and Restoring America's Watersheds" Document. For detailed information about current subwatershed management plans and studies please contact the Lake County Stormwater Management Commission (847) 918-5260. The parcel is within the Sterling Lake Subwatershed of the Des Plaines River (HUC 12-071200040301).

The watersheds plans can be found at these links:

https://www.lakecountyil.gov/2437/Watershed-Management-Plans


Jerome Creek-Des Plaines River
Sterling Lake-Des Plaines River
Waukegan River-Frontal Lake Michigan
North Mill Creek
Mill Creek
Bull Creek-Des Plaines River
Key to Features
Parcel Boundary
HUC 12 Watersheds
Streams
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WETLAND INFORMATION

These maps are not intended to be used as an absolute delineation of jurisdictional wetland boundaries. Rather, they are planning tools that can serve to identify the likely presence of wetlands in a given area. A wetland delineation can only be made by a field investigator whose work is recognized by the U.S. Army Corps of Engineers (COE). Jurisdictional wetlands/Waters of the U.S. are subject to the regulatory authority of the COE under Section 404 of the Clean Water Act, and isolated wetlands are subject to the regulatory authority of the Lake County Stormwater Management Commission (SMC) under the Watershed Development Ordinance (for corporated communities) and the Lake County Planning & Zoning Department under the Unified Development Ordinance (for unincorporated areas). A wetland delineation has to be performed to determine jurisdictional authority.

It is the policy of the District to strongly recommend against the destruction or major modification of wetlands by filling, dredging or by other non-direct impacts such as water pollution or damage due to sedimentation.

Importance of Wetland Information

Wetlands function in many ways to provide numerous benefits to society. They control flooding by offering a slow release of excess water downstream or through the soil. They cleanse water by filtering out sediment and some pollutants, and can function as rechargers of our valuable groundwater. They also are essential breeding, rearing, and feeding grounds for many species of wildlife.

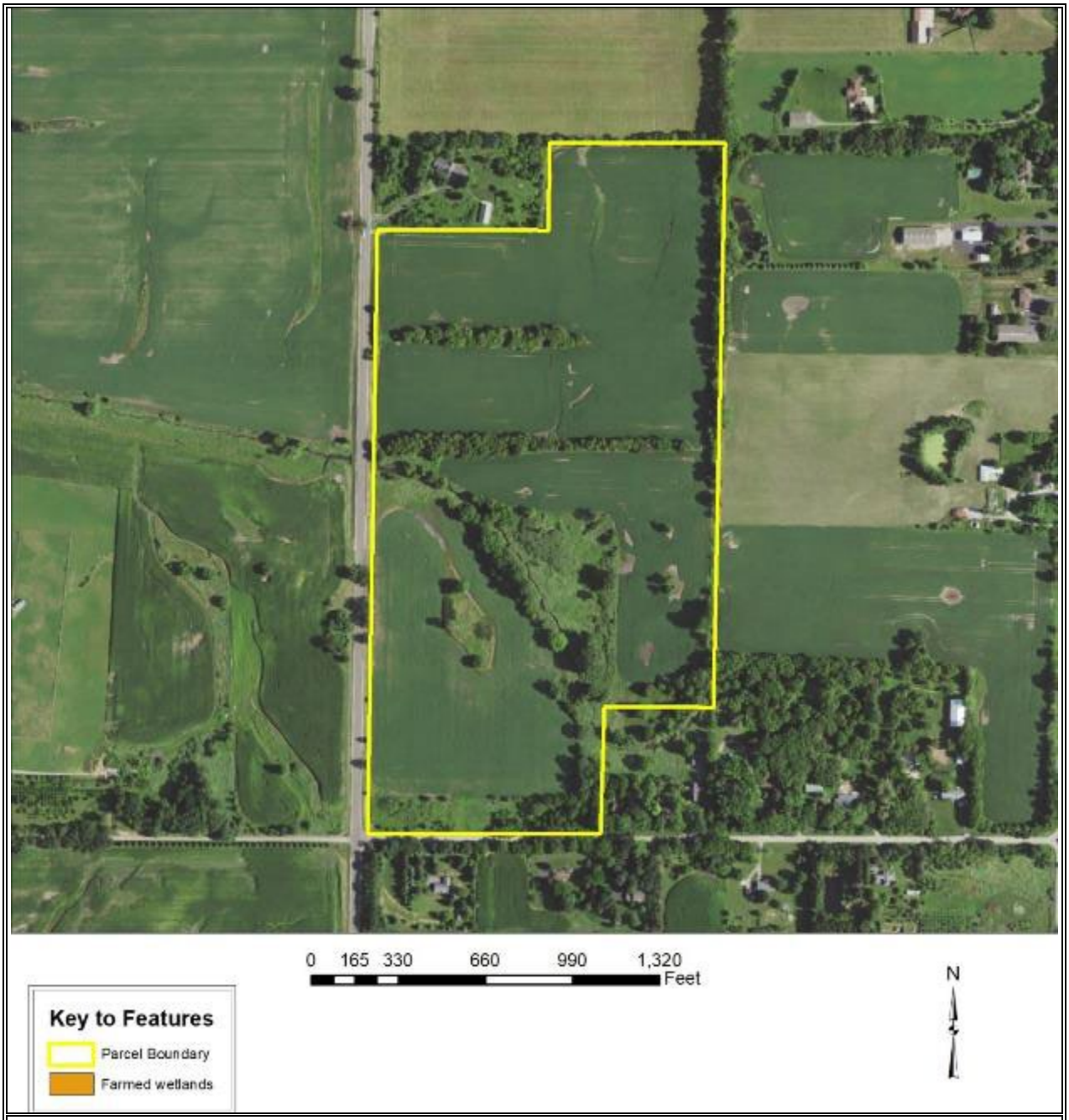
These benefits are particularly valuable in urbanizing areas as development activity typically adversely affects water quality, increases the volume of stormwater runoff, and increases the demand for groundwater. In an area where many individual homes rely on shallow groundwater wells for domestic water supplies, activities that threaten potential groundwater recharge areas are contrary to the public good. The conversion of wetlands, with their sediment trapping and nutrient absorbing vegetation, to biologically barren stormwater detention ponds can cause additional degradation of water quality in downstream or adjacent areas.

It has been estimated that over 95% of the wetlands that were historically present in Illinois have been destroyed while only recently has the true environmental significance of wetlands been fully recognized. America is losing 100,000 acres of wetland a year, and has saved 5 million acres total (since 1934). One acre of wetland can filter 7.3 million gallons of water a year. These are reasons why our wetlands are high quality and important.

USDA-NRCS Wetland Inventory

This section contains the NRCS (Natural Resources Conservation Service) Wetlands Inventory. The NRCS Wetlands Inventory is reproduced from an aerial photo at a scale of 1" equals 660 feet. The NRCS developed these maps in cooperation with U.S. EPA (Environmental Protection Agency,) and the U.S. Fish and Wildlife Service, using the National Food Security Act Manual, 3rd Edition. The main purpose of these maps is to determine wetland areas on agricultural fields and areas that may be wetlands but are in a non-agriculture setting.

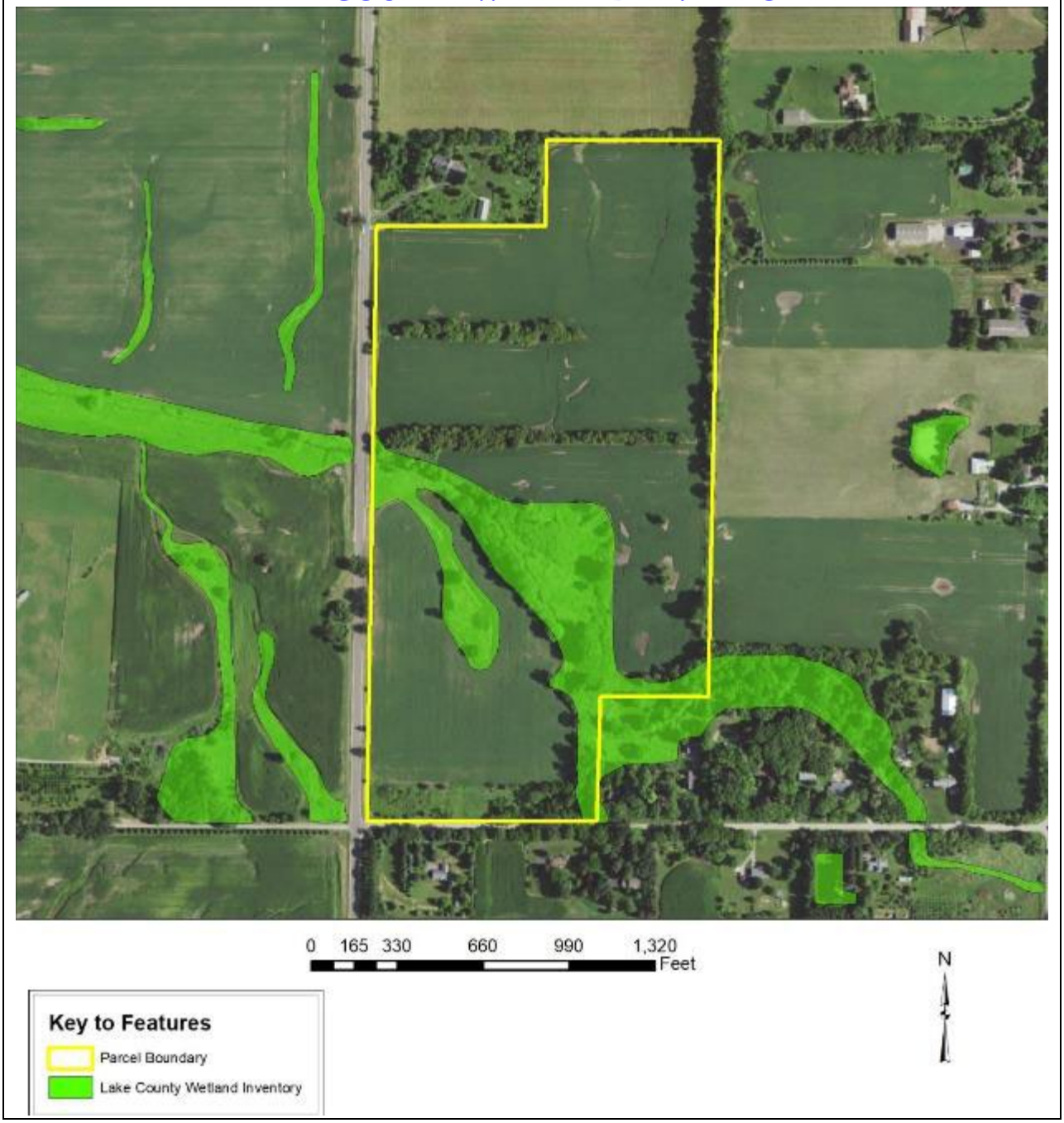
The NRCS Wetlands Inventory in no way gives an exact delineation of the wetlands, but merely an outline, or the determination that there is a wetland within the outline. For the final, most accurate wetland **determination** of a specific wetland, a wetland ***delineation*** must be certified by NRCS staff using the National Food Security Act Manual (on agricultural land.)



Natural Resources Conservation Service: Wetland Inventory Map.

The map does not identify farmed wetlands on the parcel.

LAKE COUNTY WETLAND INVENTORY



The map identifies 11.04 acres of the parcel as wetland.

ADID (ADVANCED IDENTIFICATION OF AQUATIC RESOURCES)

Wetlands are some of the most productive and diverse ecological systems on Earth. The unique characteristics of plants, soils, and water distinguish these systems. Marshes, wet meadows, fens and bogs are some of the common wetland types found within McHenry County. There are also various streams scattered throughout the county, including several that rank among the highest quality in Illinois.

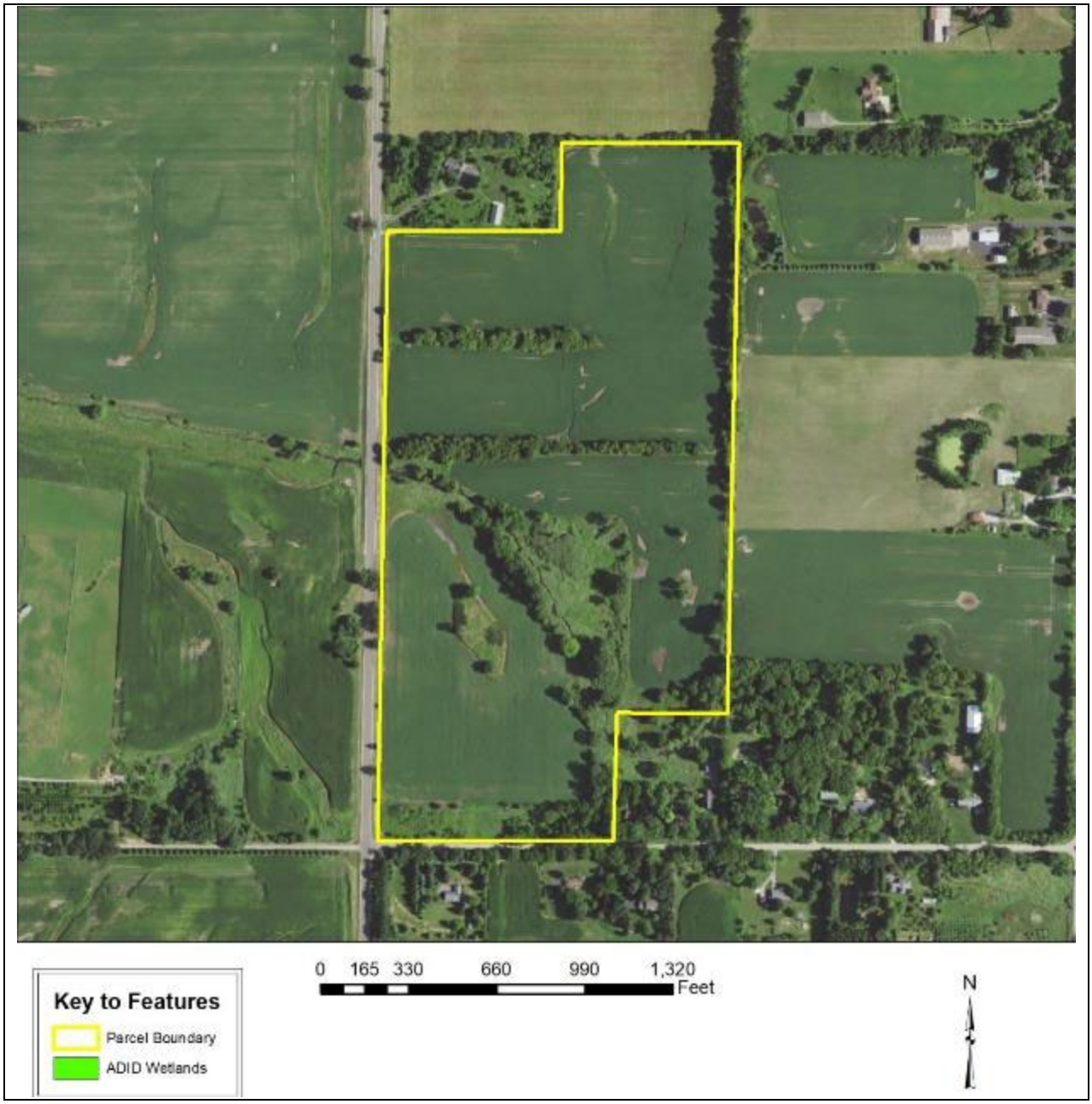
These wetlands, lakes and streams provide needed habitat and food for fish and wildlife. Diverse plants both common and rare are can be found in wetlands, and over 40 percent of Illinois' threatened and endangered plant and animal species rely on wetlands.

Wetlands have many other roles. They are critical to the control of flooding by storing vast quantities of runoff water during floods, and releasing it slowly to rivers and srteams as the floodwater recedes. This in turn helps to prevent erosion in downstream channels, aids in groundwater recharge, and stabilizes the baseflow in streams and rivers. Wetlands are also crucial in protecting water quality. Wetlands that border lakes and streams prevent erosion by holding soil in place and deflecting erosive flows and waves. They also remove sediment, nutrients, and toxic chemicals from runoff water.
Other benefits include groundwater recharge, discharge of clean water, recreation, enhancement of natural aesthetics and serve as buffers between adjacent developments.

This program designed by the EPA (Environmental Protection Agency), is intended to improve awareness of the functions and values of wetlands and other U.S. waters. It is also intended to inform landowners and developers that high quality sites may not be unsuitable for the disposal of dredged or fill material. These ADID projects can also provide guidance on the long-term protection and management of aquatic resources.

The wetland boundaries shown are not jurisdictional delineations. Any proposed drainage work in wet areas requires a certified wetland determination.

The ADID study indicates there are no ADID wetlands on the parcel in question.


Key to Features
Parcel Boundary
ADID Wetlands
0 165 330 660 990 1,320
Feet
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WETLAND AND FLOODPLAIN REGULATIONS

PLEASE READ THE FOLLOWING IF YOU ARE PLANNING TO DO ANY WORK NEAR A STREAM (THIS INCLUDES SMALL UNNAMED STREAMS), LAKE, WETLAND OR FLOODWAY.

The laws of the United States and the State of Illinois assign certain agencies specific and different regulatory roles to protect the waters within the State's boundaries. These roles, when considered together, include protection of navigation channels and harbors, protection against flood way encroachments, maintenance and enhancement of water quality, protection of fish and wildlife habitat and recreational resources, and, in general, the protection of total public interest. Unregulated use of the waters within the State of Illinois could permanently destroy or alter the character of these valuable resources and adversely impact the public. Therefore, please contact the proper regulatory authorities when planning any work associated with Illinois waters so that proper consideration and approval can be obtained.

WHO MUST APPLY

Anyone proposing to dredge, fill, rip rap, or otherwise alter the banks or beds of, or construct, operate, or maintain any dock, pier, wharf, sluice, dam, piling, wall, fence, utility, flood plain or flood way subject to State of Federal regulatory jurisdiction should apply for agency approvals.

REGULATORY AGENCIES:

- **Wetlands or U.S. Waters: U.S. Army Corps of Engineers**, Chicago District,
  231 S. LaSalle St., Suite 1500
  Chicago, IL 60604
  Phone: (312) 846-5330
- **Lake County Department of Building & Zoning (UDO):** (847) 360-6330
- **Lake County Stormwater Management Commission:** (847) 918-5260
- **Flood plains: Illinois Department of Natural Resources \ Office of Water Resources**, 201 W. Center Court, Schaumburg, IL 60196-1096, phone (708)705-4341
- **Water Quality \ Erosion Control: Illinois Environmental Protection Agency**, Division of Water Pollution Control, Permit Section, Watershed Unit, 2200 Churchill Road, Springfield, IL 62706, phone (217)782-0610.

COORDINATION

We recommend early coordination with the regulatory agencies BEFORE finalizing work plans. This allows the agencies to recommend measures to mitigate or compensate for adverse impacts. Also, the agency can make possible environmental enhancement provisions early in the project planning stages. This could reduce time required to process necessary approvals.

CAUTION: Contact with the United States Army Corps of Engineers is strongly advised before commencement of any work in or near a water of the United States. This could save considerable time and expense. Persons responsible for willful and direct violation of Section 10 of the River And Harbor Act of 1899 or Section 404 of the Federal Water Pollution Control Act are subject to fines ranging up to $27,500 per day of violation and imprisonment for up to one year or both.

THREATENED & ENDANGERED SPECIES

The State of Illinois provides habitat for 500 threatened and endangered species, including 356 plants and 144 animals. Twelve counties in Illinois have 50 or more endangered species, 5 of which are in northeastern Illinois. Lake County has the greatest known number of records of any county in the state at almost 300 ("Endangered Species of Illinois," by the U.S. Fish & Wildlife Service, IDOC Division of Natural Heritage & Endangered Species Protection Board).

Approximately 40% of the state's listed species depend on wetlands for survival. Thus, it is not surprising that Lake County has so many endangered species on record since it still has approximately 10% of its land area in natural shallow water wetland. This compares to a statewide figure of 2.6%. Thus, Lake County has a unique and valuable resource that needs to be protected and managed properly.

The two main causes for species decline are the loss of habitat and the degradation of habitat. While habitat loss is the primary reason species become endangered, the effects of habitat change are not always seen overnight. It is seldom simply a case of individual animals or plants being killed. More often, habitat loss and the resulting species declines are indirectly caused and are the result of cumulative impacts over a period of time.

It is because of this slow encroachment of habitat degradation, fragmentation and loss that wildlife habitat must be looked at on a greater scale than just the site. Cumulative impacts occur because a small amount of damage is being done over here and little over there and no one is looking at the whole picture. Thus, the villages and county are strongly encouraged to look at habitat management on a regional scale.

THERE IS A POSSIBILITY FOR ENDANGERED SPECIES ON THE SITE. IF A REQUEST HAS NOT ALREADY BEEN SUBMITTED, THE PETITIONER SHOULD ASK THE ILLINOIS DEPARTMENT OF NATURAL RESOURCES TO CHECK THIS PARCEL FOR THE PRESENCE OF THREATENED OR ENDANGERED SPECIES. SHOULD ANY SUCH SPECIES BE IDENTIFIED AS UTILIZING THIS PARCEL, THE PETITIONER WILL BE NOTIFIED ACCORDINGLY. FOR MORE INFORMATION ON HOW TO REQUEST AN ENDANGERED SPECIES CHECK ON THIS PARCEL, PLEASE VISIT
www.dnrecocat.state.il.us/ecopublic.

GLOSSARY

AGRICULTURAL PROTECTION AREAS (AG AREAS) - Allowed by P.A. 81-1173. An AG AREA consists of a minimum of 350 acres of farmland, as contiguous and compact as possible. Petitioned by landowners, AG AREAS protect for a period of ten years initially, then reviewed every eight years thereafter. AG AREA establishment exempts landowners from local nuisance ordinances directed at farming operations, and designated land can not receive special tax assessments on public improvements that do not benefit the land, e.g. water and sewer lines.

AGRICULTURE - The growing, harvesting and storing of crops including legumes, hay, grain, fruit and truck or vegetable including dairying, poultry, swine, sheep, beef cattle, pony and horse production, fur farms, and fish and wildlife farms; farm buildings used for growing, harvesting and preparing crop products for market, or for use on the farm; roadside stands, farm buildings for storing and protecting farm machinery and equipment from the elements, for housing livestock or poultry and for preparing livestock or poultry products for market; farm dwellings occupied by farm owners, operators, tenants or seasonal or year around hired farm workers.

B.G. - Below Grade. Under the surface of the Earth.

BEDROCK - Indicates depth at which bedrock occurs. Also lists hardness as rippable or hard.

FLOODING - Indicates frequency, duration, and period during year when floods are likely to occur.

HIGH LEVEL MANAGEMENT - The application of effective practices adapted to different crops, soils, and climatic conditions. Such practices include providing for adequate soil drainage, protection from flooding, erosion and runoff control, near optimum tillage, and planting the correct kind and amount of high quality seed. Weeds, diseases, and harmful insects are controlled. Favorable soil reaction and near optimum levels of available nitrogen, phosphorus, and potassium for individual crops are maintained. Efficient use is made of available crop residues, barnyard manure, and/or green manure crops. All operations, when combined efficiently and timely, can create favorable growing conditions and reduce harvesting losses -- within limits imposed by weather.

HIGH WATER TABLE - A seasonal high water table is a zone of saturation at the highest average depth during the wettest part of the year. May be apparent, perched, or artesian kinds of water tables.

Water Table, Apparent - A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water Table, Artesian - A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water Table, Perched - A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

DELINEATION - For Wetlands: A series of orange flags placed on the ground by a certified professional that outlines the wetland boundary on a parcel.

DETERMINATION - A polygon drawn on a map using map information that gives an outline of a wetland.

HYDRIC SOIL - This type of soil is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (USDA Natural Resources Conservation Service 1987)

INTENSIVE SOIL MAPPING - Mapping done on a smaller more intensive scale than a modern soil survey to determine soil properties of a specific site, e.g. mapping for septic suitability.

LAND EVALUATION AND SITE ASSESSMENT (L.E.S.A.) - LESA is a systematic approach for evaluating a parcel of land and to determine a numerical value for the parcel for farmland preservation purposes.

MODERN SOIL SURVEY - A soil survey is a field investigation of the soils of a specific area, supported by information from other sources. The kinds of soil in the survey area are identified and their extent shown on a map, and an accompanying report describes, defines, classifies, and interprets the soils. Interpretations predict the behavior of the soils under different used and the soils' response to management. Predictions are made for areas of soil at specific places. Soils information collected in a soil survey is useful in developing land-use plans and alternatives involving soil management systems and in evaluating and predicting the effects of land use.

PALUSTRINE - Name given to inland fresh water wetlands

PERMEABILITY - Values listed estimate the range (in rate and time) it takes for downward movement of water in the major soil layers when saturated, but

allowed to drain freely. The estimates are based on soil texture, soil structure, available data on permeability and infiltration tests, and observation of water movement through soils or other geologic materials.

PIQ - Parcel in question

POTENTIAL FROST ACTION - Damage that may occur to structures and roads due to ice lens formation causing upward and lateral soil movement. Based primarily on soil texture and wetness.

PRIME FARMLAND - Prime farmland soils are lands that are best suited to food, feed, forage, fiber and oilseed crops. It may be cropland, pasture, woodland, or other land, but it is not urban and built up land or water areas. It either is used for food or fiber or is available for those uses. The soil qualities, growing season, and moisture supply are those needed for a well managed soil economically to produce a sustained high yield of crops. Prime farmland produces in highest yields with minimum inputs of energy and economic resources, and farming the land results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent. (Source USDA Natural Resources Conservation Service)

PRODUCTIVITY INDEXES - Productivity indexes for grain crops express the estimated yields of the major grain crops grown in Illinois as a single percentage of the average yields obtained under basic management from several of the more productive soils in the state. This group of soils is composed of the Muscatine, Ipava, Sable, Lisbon, Drummer, Flanagan, Littleton, Elburn and Joy soils. Each of the 425 soils found in Illinois are found in Circular 1156 from the Illinois Cooperative Extension Service.
SEASONAL - When used in reference to wetlands indicates that the area is flooded only during a portion of the year.

SHRINK-SWELL POTENTIAL - Indicates volume changes to be expected for the specific soil material with changes in moisture content.

SOIL MAPPING UNIT - A map unit is a collection of soil areas of miscellaneous areas delineated in mapping. A map unit is generally an aggregate of the delineations of many different bodies of a kind of soil or miscellaneous area but may consist of only one delineated body. Taxonomic class names and accompanying phase terms are used to name soil map units. They are described in terms of ranges of soil properties within the limits defined for taxa and in terms of ranges of taxadjuncts and inclusions.

SOIL SERIES - A group of soils, formed from a particular type of parent material, having horizons that, except for texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

SUBSIDENCE - Applies mainly to organic soils after drainage. Soil material subsides due to shrinkage and oxidation.

TERRAIN - The area or surface over which a particular rock or group of rocks is prevalent.

TOPSOIL - That portion of the soil profile where higher concentrations of organic material, fertility, bacterial activity and plant growth take place. Depths of topsoil vary between soil types.

WATERSHED - An area of land that drains to an associated water resource such as a wetland, river or lake. Depending on the size and topography, watersheds can contain numerous tributaries, such as streams and ditches, and ponding areas such as detention structures, natural ponds and wetlands.

WETLAND - An area that has a predominance of hydric soils and that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

CONTACT LIST

U.S. Army Corps of Engineers
Chicago District
111 N. Canal St., 6th Floor
Chicago IL 60606-7206
312/353-6400

U.S. Environmental Protection Agency
Water Division
111 W. Jackson Blvd.
Chicago IL 60604
312/353-2147

Federal Emergency Management Agency
175 Jackson Blvd., 4th Floor
Chicago IL 60604
312/431-5501

Illinois Historic Preservation Agency
Old State Capitol
Springfield IL 62701
217/782-4836

U.S. Fish & Wildlife Service
Chicago Field Office
1250 South Grove Avenue., Suite 103
Barrington IL 60010
847/381-2253

Illinois Environmental Protection Agency
Division of Water Pollution Control
9511 West Harrison Road
Des Plaines IL 60016
847/294-4045

Illinois Department of Natural Resources
Division of Natural Heritage
600 N. Grand Ave. W.
Northwest Office Plaza, Suite 4
Springfield IL 62706
217/785-8774

Illinois Department of Agriculture
Bureau of Soil & Water
State Fairgrounds
P.O. Box 19281
Springfield IL 62794
217/782-6297

Illinois Department of Natural Resources
Private Lands Biologist
9511 W. Harrison St.
Des Plaines IL 60010
708/294-4129

Illinois State Geological Survey
Natural Resources Building
615 E. Peabody Dr.
Champaign IL 61820
217/333-4747

Illinois Department of Transportation
Division of Water Resources
201 W. Center Court, 3rd Floor East
Schaumburg IL 60196-1096
708/345-9780

USDA Natural Resources Conservation Service
1648 S. Eastwood Dr.
Woodstock IL 60098
815/338-0049 x3

Lake County Health Department
Division of Environmental Health
3010 Grand Ave.
Waukegan IL 60085
847/360-6700

Lake County Stormwater Management Commission
333-B Peterson Rd.
Libertyville IL 60048
847/918-5260

Chicago Metropolitan Agency for Planning
233 S. Wacker Drive, Ste. 800
Chicago IL 60606
312/454-0400

Lake County Forest Preserve District
2000 N. Milwaukee Ave.
Libertyville IL 60048
847/367-6640

Lake County Planning and Development
18 N. County St.
Waukegan IL 60085
847/360-6330

Lake County Planning, Building & Development
18 N. County St.
Waukegan IL 60048
847/360-6350

Lake County Department of Transportation
P.O. Box 220, Winchester Rd.
Libertyville IL 60048
847/362-3950

REFERENCES

Soil Survey of Lake County, Illinois, USDA-SCS in cooperation with the Illinois Agricultural Experiment Station – September 1970.

Geology For Planning In Lake County, IL. State of IL Department of Registration and Education, Illinois State Geologic Survey 1973.

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USDA-SCS National Soils Handbook – latest amended.

Lake County Board of Health Ordinance, Article V, Regulations of Individual Sewage Tank Absorption Fields, Northeast Illinois USDA-SCS MODERATE, 1983.

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Lower Des Plaines Tributaries Watershed, Cook, DuPage, and Lake Counties, Illinois USDA-SCS, MSD, IDOT-DWR – July 1987.

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IEPA – Stormwater Detention for Water quality Benefits, NIPC – January 1986.

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Lake County Soil and Water Conservation District, Subsurface Drainage Maps (on 1954 Aerials).

Lake County Planning and Zoning and Environmental Quality Aerial Maps of County – May 1980, 1986.

Natural Areas Inventory, Publish IDOC, Springfield, Illinois 62706, November 1978.

A Citizens' Guide to Protecting Wetlands. By The National Wildlife Federation. Washington, D.C., March 1989.

Potential for Contamination of Shallow Aquifers in Illinois (Plate 2). Illinois Department of Energy and Natural Resources – State Geological Survey Division. Natural Resources Building, 615 E. Peabody Drive, Champaign, Illinois 61820, 1984.

Illinois Environmental Protection Agency, Standards and Specification for Soil Erosion and Sediment Control, Illinois EPA – October 1987.

National Wetlands Inventory Maps, Department of the Interior, Fish and Wildlife Service, 1984.

2000 Land Atlas & Plat Book, Lake County IL, 11th Edition. Published by Rockford Map Publishers, Inc.

Appendix:

SOIL EROSION & SEDIMENT CONTROL

Development on this site must include the use of a Soil Erosion and Sedimentation Control (SESC) plan, under the Watershed Development Ordinance (WDO) of the Lake County Stormwater Management Commission. Soil erosion during and after this proposed construction can be a primary non-point source of water pollution. Eroded soil during the construction phase can create unsafe conditions on roadways, decrease the storage capacity of lakes, clog streams and drainage channels, cause deterioration of aquatic habitats, and increase water treatment costs. Soil erosion also increases the risk of flooding by choking culverts, ditches and storm sewers, and by reducing the capacity of natural and man-made detention facilities. It is important that a comprehensive SESC plan be developed for all phases of site development, that these practices are installed prior to any site disturbance, and rigorously maintained throughout all phases of the project.

The SESC plan for the proposed development must take into consideration the property's proximity to highly valued habitats and the potential for negatively impacting these areas. The plan needs to be comprehensive and properly implemented and maintained.

The general principles of erosion and sedimentation control measures include:

- reducing or diverting flow from exposed areas, storing flows or limiting runoff from exposed areas,
- staging construction in order to keep disturbed areas to a minimum,
- establishing or maintaining or temporary or permanent groundcover,
- retaining sediment on site and
- properly installing, inspecting and maintaining control measures.

Erosion control practices are useful controls only if they are properly located, installed, inspected and maintained.

The SESC plan for the proposed development must take into consideration the presence of highly erodible soils. The plan needs to be comprehensive and properly implemented and maintained.

For developments, the District recommends that the following erosion control measures be included in development plans, implemented and maintained throughout the life of projects. Each of these recommendations can be referenced by code number in the Illinois Urban Manual.

Silt Fencing (Code 920): Silt fences are very often installed improperly, overused, and not properly monitored or maintained. At all sites, silt fences should be trenched in (six inches) around any body of water and waterways. The silt fence should be used to handle sheet flow only, not concentrated flow such as in swales. The fence, which should be installed prior to any land disturbing activity, should be inspected weekly and after significant rain event.

Storm Sewer Inlet Protection: The use of straw bales for inlet protection is not recommended due to their lack of effectiveness and high maintenance requirements. Instead, any one of the 3 following practices will be much more effective:

a. Block and gravel system (Code 850)
b. Excavated drain (Code 855)
c. Fabric drop (Code 860) – this practice involves placing geotextile fabric under the grates. **This practice requires weekly inspections.**

Use of Detention Basins During Construction: The detention basin should be excavated prior to any other grading activities. The basin can be used as a sediment trap during construction if it is over-excavated or later cleaned out after construction has been completed. If the detention area will not be used as a sediment basin, a silt fence should be installed around the upslope perimeter of it to prevent it from filling in.

Rock Outlet Protection (Code 910): The outlet end of all culverts, conduits or channels should be stabilized with properly sized rip-rap placed over geotextile fabric. This will protect the outlet structure, prevent scour erosion and minimize downstream erosion by reducing the velocity and energy of concentrated stormwater flows at these points of high velocity flow.

Concentrated Flow Areas: The use of straw bales in areas of concentrated flow areas, such as swales, is not recommended. Their poor filtering ability and high maintenance requirements make them ineffective for soil erosion control. Alternatives to straw bales include:

a. Rock Check Dams (Code 905, Draft)
b. Silt fence in conjunction with a reinforcing wire fence with steel posts.
c. Silt dykes: These reusable, triangular fabric dykes can be used to control erosion in swales.

All swales should be protected with sod or erosion control blankets immediately after final grading.

Grading and Topsoil Activities: If the site will be mass graded, consideration must be given to protection of the site after topsoil removal and erosion prevention of the topsoil stockpile. To do this, the following concepts can be used:

a. Temporary seeding of graded area and topsoil stockpile (Code 965)
b. Mulching of graded area (Code 875)
c. Silt fencing around topsoil stockpile

Stabilized Construction Entrance: (Code 930) Special consideration should be given to the prevention of sediment being brought off-site. A stabilized pad of aggregate underlain with filter fabric should be located at any point where traffic will be entering or leaving the site to or from a public right-of-way during active construction.

Temporary Seeding: Per the County's Watershed Development Ordinance, all areas that will be exposed longer than 14 working days must be temporarily seeded or mulched. Appropriate seeding includes annual rye or oats.

For large drainage areas, temporary sediment basins should be installed (Code 960).

Porous Pavement (Code 890): A pavement consisting of strong materials having regularly interspersed void areas which are filled with pervious materials, such as sod, gravel or sand. The purpose of this practice is to reduce water pollution from low-volume traffic areas by providing a bearing surface having adequate strength to accommodate vehicles while allowing infiltration of surface water and filtration of pollutants. This practice is intended to achieve this purpose by:

1) Reducing volume and peak rate of runoff flow, thus reducing the likelihood of sewer overflows, flooding, and downstream erosion, and sediment pollution.
2) Reducing the loading and concentration of pollutants in the runoff.

Preventing the onset of erosion is much less expensive and much more effective than keeping erosion in check and conducting clean-up efforts when these efforts fail.

Detailed information on the most appropriate methods of controlling erosion and sedimentation in urbanizing areas may be found in the publication Procedures and Standards for Urban Soil Erosion and Sedimentation Control in Illinois (Greenbook) as well as the **Illinois Urban Manual**. These manuals and additional technical assistance may be obtained by contacting this office. A copy of the Lake County Stormwater Management Commission Technical Reference Manual can be obtained by calling 847-918-5260. The Northeastern Illinois Planning Commission (NIPC) has published the Suggested Soil Erosion and Sedimentation Control Ordinance: Guide for Local Officials. This can be ordered by calling 312-454-0400.

Our office is available for consultation on soil erosion and sediment control concerns. We also periodically sponsor workshops on this topic.

OPEN SPACE MANAGEMENT

Open space is an important resource, especially in an urban area as it provides recreational opportunities, valuable wildlife habitat and resource protection.

A common misconception regarding open space is that by merely protecting a natural area from direct or indirect impacts, its long-term survival has been insured. Open space must be properly managed. This can include the removal of undesirable (non-native or invasive) vegetation and the restoration of native plant communities to enhance habitat for local species of wildlife.

Woodland, wetland and native grassland areas are complex ecosystems that must be perpetually managed to insure their continued biological diversity. A typical landowner may not have knowledge of this type of management, possess the means by which to do it, or have the desire to perform the management, and may even undertake activities which adversely affect these areas.

Open space areas may be owned in a variety of ways. The most common technique is a property owners association in which each person owns a fractional share of the open land and has a legal responsibility to contribute to its maintenance and upkeep. The use of the land is restricted by deed restrictions. Trail systems can be developed to allow all residents of the subdivision to utilize these areas for passive recreation. A second option is private ownership (lot owners or the developer) with deed restrictions.

Tax responsibility can be a consideration. Open space in a development is taxable land, though the deed restrictions lower the value of the open space. This is offset, however, by the increased value of homes adjoining the open space.

Since homeowners' associations may not have the technical and financial resources to adequately manage such areas, and the area is still potentially subject to future land use change requests, transferring ownership to a conservancy group, park district, forest preserve district or other such resource-oriented organization is a better option. Trained personnel whose primary goal is to maintain the area into perpetuity can conduct management activities on an area-wide basis.

Minimally, an open space management plan needs to be developed and implemented which includes a funding mechanism to insure long-term management.

DRAINAGE DISTRICTS AND WHO TO CALL FOR DRAINAGE PROBLEMS

Active Drainage Districts in Lake County, Illinois:

East Skokie – (847) 831-2371 (includes areas in Highland Park, Lake Forest, Highwood, Lake Bluff, North Chicago, & Waukegan).
West Skokie – (312) 782-4780 (includes areas in Libertyville, Shields, West Deerfield, and Vernon Townships).
Union – (847) 945-0600 (includes areas in the communities of West Deerfield, Lake County and North Field, Cook County).
Slocum – (847) 526-1355 (includes areas in Cuba and primarily Wauconda Townships).
Squaw Creek – (847) 582-2255 (includes areas in Avon, Grant and primarily Fremont Townships).
Grubb School – (847) 395-5787 (includes areas in Antioch).
Avon-Fremont – (847) 223-2037 (includes areas in Avon and Fremont Townships).
Beach Park – (847) 336-2985 (includes areas in Beach Park, Park City, North Chicago, and Waukegan).

FOR MORE INFORMATION ON DRAINAGE DISTRICTS, PLEASE CALL THE LAKE COUNTY STORMWATER MANAGEMENT COMMISSION AT (847) 918-5260.

DRAINAGE PROBLEMS - WHO TO CALL IN LAKE COUNTY, IL

REFER TO:	WHEN THE CALL RELATES TO:	ADDITIONAL INFORMATION:
LAKE COUNTY STORMWATER MANAGEMENT COMMISSION (847) 918-5260 WWW.CO.LAKE.IL.US/SMC	1. Neighborhood, watershed or regional scale problems 2. Interjurisdictional issues 3. Involves a violation of the Lake County Watershed Development Ordinance [related to new development and in non-certified communities]	Relies on other governmental units to respond to smaller scale problems; has field staff to investigate drainage complaints in non-certified communities; funding available for repair or maintenance of drainage facilities and drainage problems; compiles drainage data for watershed planning and should be notified by Certified Communities of major problems.
LAKE COUNTY PLANNING, BUILDING, & DEVELOPMENT DEPARTMENT, ENGINEERING AND ENVIRONMENTAL SERVICES DIVISION (E&ES) (847) 377-2600	1. Complaint is on a parcel located in an unincorporated area. 2. Drainage complaints, erosion control, Site Development Permits 3. Individual, neighborhood, watershed scale problems 4. Involves a violation of the Lake County Unified Development Ordinance (related to older or new development).	Has field staff to inspect and respond to drainage complaints in unincorporated areas; can require remedial activity if in violation of the Lake County Unified Development Ordinance; funding available for repair or maintenance of drainage facilities; provides notification to SMC of regional scale problems.
LOCAL MUNICIPALITIES	1. Lot and Neighborhood level drainage concerns 2. Emergency response: sandbags, evacuation procedures	Usually have staff or budget through public works to handle common problems; have authority to enter lands to remove blockages even outside own boundaries.
TOWNSHIP HIGHWAY DEPARTMENTS	1. Drainage concerns are within the right-of-way of a township road.	Sometimes staff is able to reduce local flooding problems by improvements along ROW but is not common; policies vary from Township to Township; not able to assist in areas outside its own ROW.
LAKE CO. DIV. OF TRANSPORTATION (LCDOT) (847) 362-3950	1. Bridges, culverts, ditches, within the right-of-way (county roads)	Maintains all bridges, culverts and ditches within the ROW of county highway signs signified by blue and gold route markers saying Lake County.
LAKE COUNTY HEALTH DEPARTMENT (LCHD), DIVISION OF ENVIRONMENTAL HEALTH (847) 360-6740	1. Contamination of an individual well. 2. Failure of individual septic.	Primary concern for water quality specifically public beaches, indiv. wells & septics; required to respond within 14 days but can only assist if flooding problems results in failure of septic or contamination of well.
LAKE COUNTY SOIL AND WATER CONSERVATION DISTRICT (SWCD) (847) 223-1056 U.S. DEPT. OF AGRICULTURE (NRCS)	1. Agricultural drainage issues or drainage issues related to soil erosion.	Provides technical assistance and education; has some information on farm tiles; field staff makes site visits upon requests.
DRAINAGE DISTRICTS	1. Problem associated with drainage ditches and streams within a drainage district.	Provides information, technical assistance; field staff may be available for site visits in cases of severe drainage, soil erosion.
FOX WATERWAY AGENCY (847) 587-8540	1. Debris removal, shoreline protection, flood control, flood warning for Chain area.	Primarily responsible for dredging, debris removal, shoreline protection, flood control, flood warning for Chain O'Lakes area; has staff for site visits.
LAKE COUNTY EMERGENCY MANAGEMENT AGENCY (LCEMA) (SHERIFFS OFFICE) (847) 377-7100	1. Request for sandbags and evacuation procedures is coordinated by municipal EMA coordinators and township officials.	Primarily responsible for emergency services in a disaster; works closely with local ESDA coordinators during a disaster/flood event. Refer requests for sandbags and evacuation procedures to local municipality or to township; does not distribute insurance claims.
US GEOLOGICAL SURVEY - URBANA, IL (217) 344-0037	1. Provides real-time, unofficial river/stream stage information, rain totals (SMC rain/stream gages are the same as USGS gages)	Data available at: http://il.water.usgs.gov

STORMWATER MANAGEMENT AND WATER QUALITY IMPACTS

Development of a property results in compaction of soil and the addition of areas of impervious surfaces (rooftops, roadways, etc.) which will greatly increase the amount of stormwater runoff generated by the site.

The District strongly recommends the use of on-site stormwater management to reduce the potential for degrading water quality in the area. Runoff should be retained in on-site basins in order to provide sufficient opportunity to improve the water quality of the runoff to prevent degradation of the water quality in the area. Stormwater should be released at a rate that approximates natural, undisturbed runoff conditions. Insufficient stormwater management on the site could threaten the stormwater capacity of the surrounding drainageways or aggravate flooding conditions on surrounding properties or elsewhere in the watershed.

The District discourages allowing stormwater runoff produced by urban development to flow into natural flood control features such as floodplains and wetlands. On this site, these features are currently accepting and regulating the stormwater runoff that is generated by undeveloped land. If the runoff generated by impervious surfaces such as rooftops and roadways is loaded into these natural features, their flood control capabilities could be overburdened and flooding damage could result. In addition, pollutants association with stormwater runoff can degrade the water quality in the area.

The utilization of wet basin stormwater retention ponds is recommended by the District over the use of dry detention basins as wet basin designs tend to provide increased water retention times, allowing for greater water quality improvements to occur. Increased retention times allow more sediment to settle out of suspension. Because of this sediment-trapping tendency, suitable access needs to be provided to a wet basin to allow for periodic maintenance and sediment removal.

The basins should be installed in the first phase of the project as the basin or pond can serve as a sediment trap during the construction phase.

It is also encouraged to design the detention area to provide multiple benefits to the community. The incorporation of open space, constructed wetlands and recreational areas adds to the value of the detention facility as well as to its water quality improvement capabilities. In order to reduce the attraction of a resident Canada goose population, the retention pond should not be mowed down to the edge. Unmowed native plants are a natural deterrent to nuisance goose problems.

Numerous publications are available which provide guidance on planning stormwater management systems and incorporating multiple benefits. These include Stormwater Detention for Water Quality Benefits (NIPC, 1986), Stormwater Management (IDOT-DWR, 1983), the Lake County Technical Reference Manual (SMC, 1992), A Current Assessment of Urban Best Management Practices (Metropolitan Washington Council of Governments, 1992), Design of Stormwater Wetland Systems (Metropolitan Washington Council of Governments, 1992), The Use of Wetlands for Controlling Stormwater Pollution (Terrene Institute, 1992), and Urban Runoff Pollution Prevention and Control Planning (U.S. EPA Handbook, EPA/625/R-93/004, 1993).

NATIONAL POLLUTATN DISCHARGE ELIMINATION SYSTEM

Discharges of stormwater from construction sites that disturb 1 or more acres of land must be covered by an NPDES permit. Under the NPDES General Permits for Stormwater Discharges from Construction Sites, the EPA requires the development and implementation of a pollution prevention plan.

A pollution prevention plan for the construction is designed to reduce pollution at the construction site before it can cause environmental problems. Many of the practices and measures required for the

pollution prevention plan represent the standard operating procedure at many construction sites. Stormwater management controls, erosion and sediment controls, inspection and maintenance have all been used at a number of construction projects.

The General NPDES permit can be obtained through the Illinois Environmental Protection Agency, Division of Water Pollution Control, 2200 Churchill Road, P.O. Box 19276, Springfield, Illinois 62794-9276.

APPENDIX J

Fence Screen Product Details

GRAINGER

Fence Screen: Green, Polypropylene, 8 ft Overall Ht, 25 ft Overall Lg, 95% Shade Percent

Item **48NW15**

Mfr. Model **MTP-95-03-0825**

Compare

Web Price
$418.16 / each

Qty 1

Add to Cart

Ship | Pickup

Expected to arrive **Wed. Nov 06.**

Ship to **60601** | Change

Shipping Weight **9 lbs**

Ship Availability Terms

Add to List

Product Details

Catalog Page **N/A**

Brand **APPROVED VENDOR**

Manufacturer Part Number **MTP-95-03-0825**

Material **Polypropylene**

Color **Green**

Overall Height **8 ft**

Overall Length **25 ft**

Shade Percent **95 %**

Includes **Brass Grommets 24 in Apart**

Features
Durable Mesh for Dump, Garbage, Gravel, Grain, Asphalt, Nursery, Wood Chip Trucks, Tennis Court Curtains and Pool Covers

UNSPSC **20101601**

Country of Origin **USA (subject to change)**

Product Description

Windscreens reduce air currents, keep noise contained, block dust and debris, and provide a clean backdrop to improve conditions at sports fields, golf courses, and other recreational areas. Also known as fence screens, they install along fencing and create a privacy barrier that minimizes outside distractions.

Compliance & Restrictions

This item is restricted for international sale.

Chat with an Agent

APPENDIX K

EcoCAT

EcoCAT
Ecological Compliance Assessment Tool

Applicant: ECA Solar
Contact: Riley Norman
Address: 221 Crescent St
[redacted]

IDNR Project Number: 2405909
Date: 10/19/2023

Project: W 9th St Solar
Address: 14280 W 9th Street , Zion

Description: ECA is interested in developing this area for a community solar project.

Natural Resource Review Results

This project was submitted for information only. It is not a consultation under Part 1075.

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Blanding's Turtle *(Emydoidea blandingii)*

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

County: Lake

Township, Range, Section:
46N, 11E, 2
46N, 11E, 11

IL Department of Natural Resources Contact
Impact Assessment Section
217-785-5500
Division of Ecosystems & Environment

Disclaimer

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

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

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Lake County, Illinois

Local office

Chicago Ecological Service Field Office

(312) 485-9337

U.S. Fish And Wildlife Service Chicago Ecological Services Office

230 South Dearborn St., Suite 2938
Chicago, IL 60604-1507

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

NOT FOR CONSULTATION

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Endangered

Birds

NAME	STATUS
Piping Plover Charadrius melodus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6039	Endangered
Red Knot Calidris canutus rufa Wherever found There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane Grus americana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/758	EXPN

Insects

NAME	STATUS
Karner Blue Butterfly Lycaeides melissa samuelis Wherever found There is **proposed** critical habitat for this species. https://ecos.fws.gov/ecp/species/6656	Endangered
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

NOT FOR CONSULTATION

Flowering Plants

NAME	STATUS
Eastern Prairie Fringed Orchid Platanthera leucophaea Wherever found	Threatened

This species only needs to be considered if the following condition applies:

- Follow the guidance provided at https://www.fws.gov/midwest/endangered/section7/s7process/plants/epfos7guide.html

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/601

Pitcher's Thistle Cirsium pitcheri Wherever found	Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8153

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

NOT FOR CONSULTATION

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

Additional information can be found using the following links:

- Eagle Managment https://www.fws.gov/program/eagle-management

- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted

Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

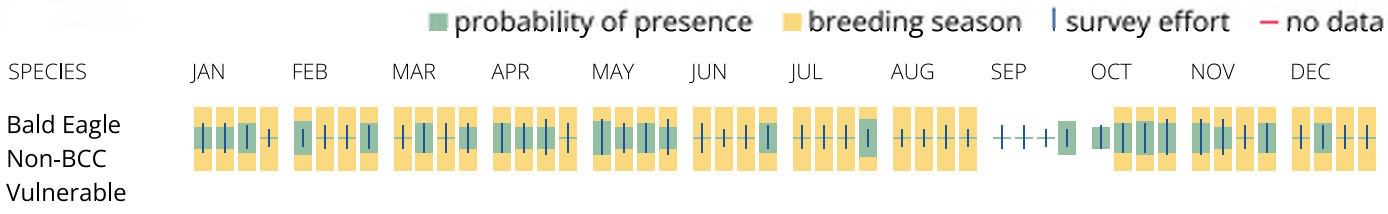
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

NOT FOR CONSULTATION



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project

intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NOT FOR CONSULTATION

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Oct 15 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25

Eastern Whip-poor-will Antrostomus vociferus — Breeds May 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Henslow's Sparrow Ammodramus henslowii — Breeds May 1 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3941

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Prothonotary Warbler Protonotaria citrea — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Rusty Blackbird Euphagus carolinus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

NOT FOR CONSULTATION

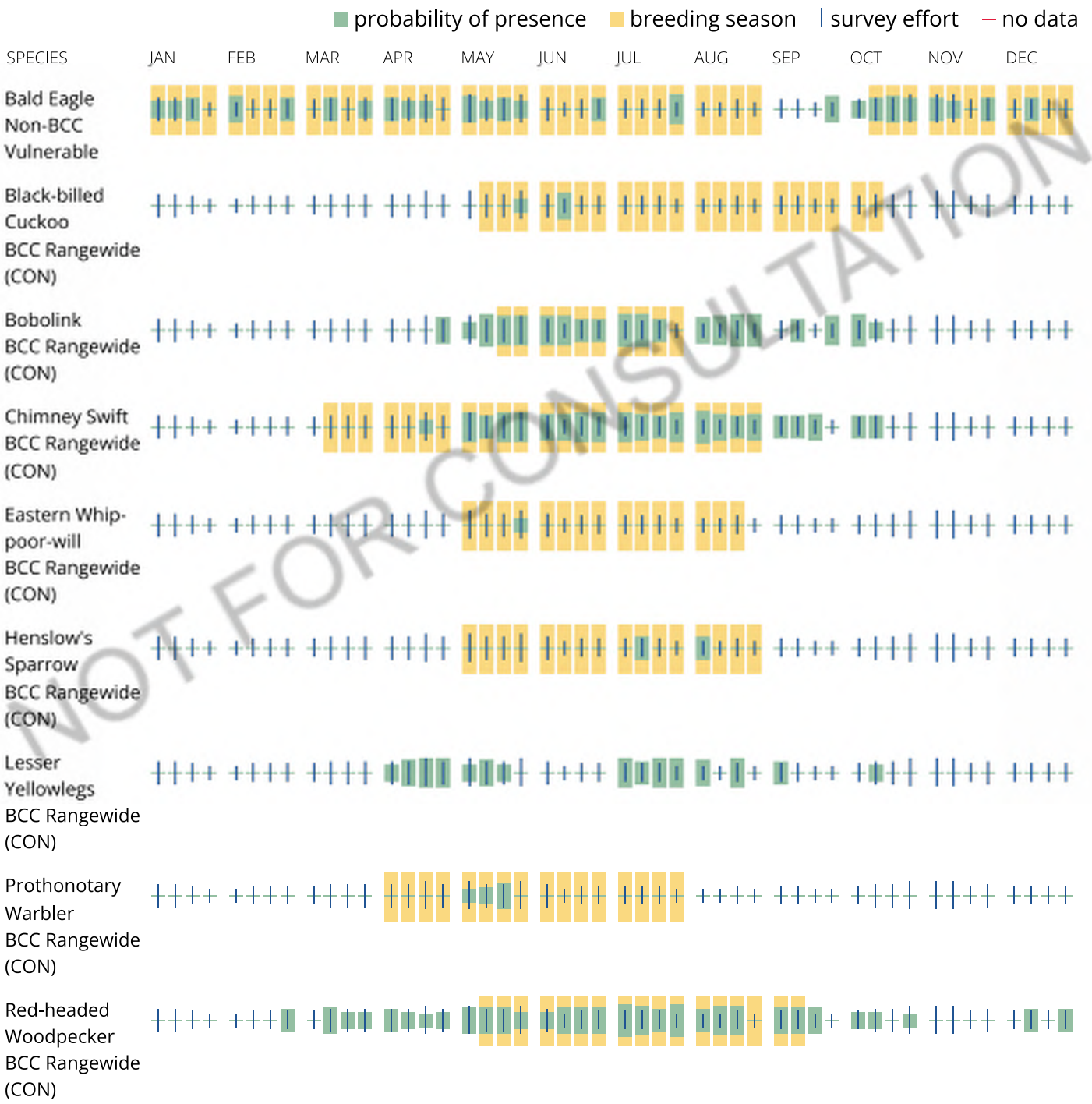
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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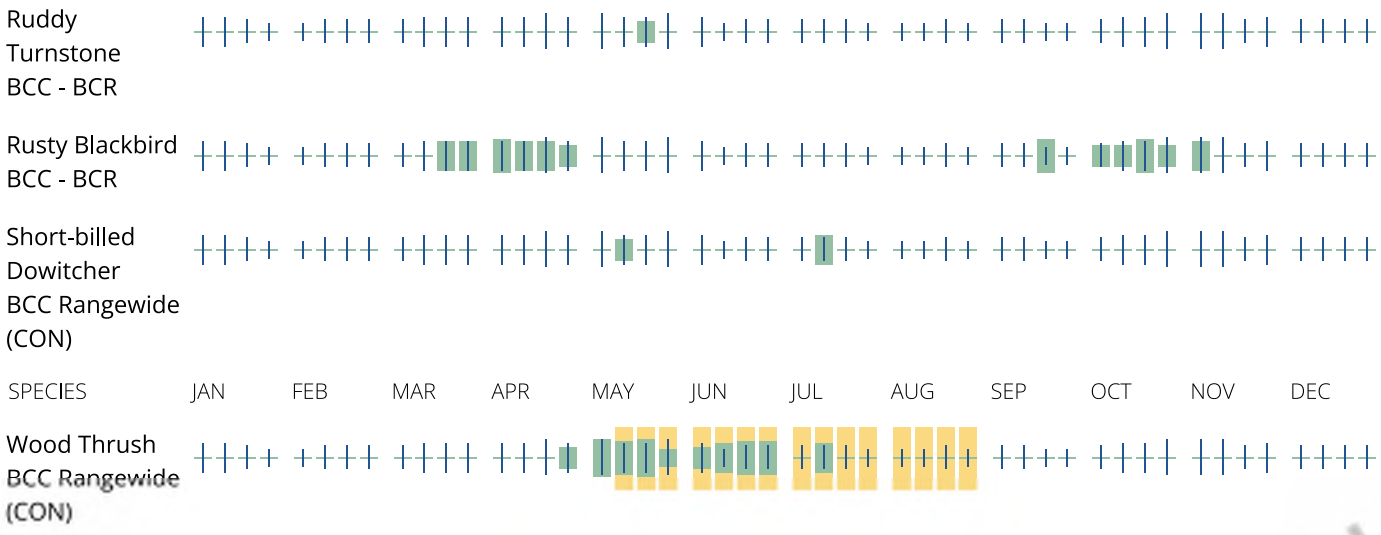

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

NOT FOR CONSULTATION

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

NOT FOR CONSULTATION

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

NOT FOR CONSULTATION

Facilities

National Wildlife Refuge lands

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

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

(NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

NOT FOR CONSULTATION

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should

seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

APPENDIX L

Decommissioning Plan & Estimate

DECOMMISSIONING PLAN

ZION COMMUNITY ENERGY INITIATIVE LLC

14280 9TH STREET ZION, IL

DECOMMISSIONING PLAN

Introduction

Zion Community Energy Initiative LLC developed this decommissioning plan for the Commercial Solar Energy Facility located at 14280 9th Street in Zion, IL. This plan will be implemented after the contracted lease term has ended or if deemed abandoned. ***Decommissioning of the Project will be the responsibility of Zion Community Energy Initiative LLC***. This plan is part of the Agricultural Impact Mitigation Agreement (AIMA) between Zion Community Energy Initiative LLC and the Illinois Department of Agriculture. This plan is provided to Lake County and as part of the permitting conditions for the Conditional Use Permit as approved by Lake County.

Pursuant to the Renewable Energy Facilities Agricultural Impact Mitigation Act this plan and the accompanying AIMA represent the standards and conditions required to mitigate impacts to agricultural lands resulting from the constructed and deconstructed commercial solar energy facility. This plan relies upon the AIMA to establish the majority of the conditions and requirements for the deconstruction activities. Where this plan and the AIMA conflict or disagree, the AIMA will serve as the prevailing document.

Abandonment

If the Zion Community Energy Generating facility does not produce energy for a continuous period of one year or more, it shall be presumed to have been abandoned. Zion Community Energy Initiative LLC may request a Good Cause Exemption from Illinois Department of Agriculture and Lake County that may not be unreasonably withheld so long as all Real Estate and Personal Property Taxes are in Good Standing. Any Facility that has been abandoned without attaining a Good Cause Exemption must be decommissioned and removed within 180 days.

Decommissioning must consist of:

a. Physical removal of all solar photovoltaic facilities, structures, equipment, security barriers and transmission lines from the site.
b. Recycling or disposal of all solid and other waste in accordance with local, state, and federal regulations.
c. Stabilization or re- vegetation of the site as necessary to minimize erosion. The Landowner is authorized to allow the Solar Facility Owner or Operator to leave landscaping or designated below grade foundations in place in order to minimize erosion and disruption to vegetation and/or agriculture.

Decommissioning Activities

Decommissioning of the Zion Community Energy Generating facility will include removal of all above-ground infrastructure, including the arrays, inverter structures, concrete foundations and pads, electrical infrastructure and perimeter fences. Grading and re-vegetation will comply with all applicable rules and regulations. Concrete footings or foundations (if present) occurring less than 36 inches below soil surface will be removed. Exclusions from the decommissioning plan include planting trees and regrading to previous conditions. Decommissioning activities will follow the *Illinois Urban Manual: An Erosion and Sediment Control Best Management Practice Manual* for erosion and sediment control and stormwater management that are applied during project construction, or any new best management practices relevant at the time.

Zion Community Energy Initiative LLC will decommission the Project once the contracted lease term is over or if deemed abandoned. Decommissioning may also be initiated if the project is no longer viable, or in the

case of a force majeure event as described in the subsequent section. Zion Community Energy Initiative LLC will provide notice to Lake County prior to the start of decommissioning.

Estimated Timeline and Cost

Decommissioning activities will be completed within 180 days from commencement of the decommissioning process as described herein. Zion Community Energy Initiative LLC estimates the cost of decommissioning to be approximately $235,520. This estimate assumes a potential secondary market for certain components of the Project equipment, and disposal or recycling of other components aligned with industry best practices. The salvage value is not included in the decommissioning estimate.

Our estimate is an internal assessment based upon industry standards, recent project estimates and state and municipal guidance documents and regulations. Data for completed solar decommissioning is limited; however, there are some reliable sources available to create fair estimates. Attached is a copy of the guidance document for decommissioning solar panels prepared in 2020 by the New York State Energy Research & Development Authority (NYSERDA) as well as the Town of Athol Massachusetts Solar Decommissioning Template. These two reference documents have been used by many other states and municipalities. Estimates for developing decommissioning costs are included in section 1.2 of the NYSERDA document and page two of the Athol document.

Zion Community Energy Initiative LLC obtained decommissioning cost estimates from five projects: a 2024 estimate for a 300 MW AC project in Allen County OH; a 2022 estimate for a 80 MW AC project in Orange County, VA; a 2022 estimate for a 7.5MW DC project in Ballston, NY; a 2022 estimate for a 420 MW DC project in Dunn County WI; and a 2022 estimate for a 5MW AC project in Wareham, MA. A construction inflation rate of 14.6% was calculated using the Rider Levett Bucknall index for converting 2022 costs to 2024. These estimates are attached for your reference.

Zion Community Energy Initiative LLC used these documents and the publicly available project decommissioning cost estimates to develop our estimate. A capital cost of $36,426/MW DC (without inflation) appears to be a fair average cost per MW DC, without a deduction for salvage value. Applying a 14.6% inflation rate to this 2022 average cost results in a 2024 rate of $41,744/MW DC. The project is proposed as a 5.642 MW DC size which equals $235,520 as a decommissioning estimate.

Continued Beneficial Use

If prior to decommissioning the Project, the landowner determines that any of the Project components can be beneficially used on the land after disassembly, such items would be exempt from the requirements for decommissioning. If a third party acquires the Project or a portion of the Project, such third party would be responsible for providing evidence of a plan of continued beneficial use for their relevant Project components.

Force Majeure

An exception to these requirements will be allowed for a *force majeure* event, which is defined as any event or circumstance that wholly or partly prevents or delays the performance of any material obligation arising under the Project permits, but only to the extent:

a. Such event is not within the reasonable control, directly or indirectly, of Zion Community Energy Initiative LLC (including without limitation events such as fire, earthquake, flood, tornado, hurricane, acts of God and natural disasters; war, civil strife or other similar violence);
b. Zion Community Energy Initiative LLC has taken all reasonable precautions and measures to prevent or avoid such event or mitigate the effect of such event on Zion Community Energy Initiative LLC‘s ability to perform its obligations under the Project permits and which, by the exercise of due diligence, it has been unable to overcome; and

c. Such event is not the direct or indirect result of the fault or negligence of Zion Community Energy Initiative LLC.

In the event of a force majeure event, which results in the absence of electrical generation by one or more solar panel arrays for 12 months, Zion Community Energy Initiative LLC must demonstrate to Lake County by the end of the 12 months of non-operation that the Project will be substantially operational and producing electricity within 24 months of the force majeure event. If such a demonstration is not made to Lake County satisfaction, the decommissioning of any single solar panel only (and no other part of the Project that is operational) or if the entire Project is not substantially operational and producing electricity, then decommissioning of the Project must be completed 18 months after the force majeure event.

Financial Instrument

Zion Community Energy Initiative LLC will provide a financial instrument to ensure the timely decommission of the project. This instrument shall be a performance bond, escrow, cash, certificate of deposit, irrevocable letter of credit, corporate guarantee or other equivalent. The financial instrument will provide payment to the landowner and County for the value of the decommissioning costs as outlined in the AIMA, specifically Item 17(D)(1-3). The instrument will remain valid for the entire duration of the project. The financial instrument shall be renewed and replaced if necessary to account for any changes in the total decommissioning cost. The financial instrument shall be in place prior to issuance of a Certificate of Occupancy/Operation by the County. The financial instrument shall be reviewed and renewed in accordance with the AIMA, specifically Item 17(D)(1-3).

ZION COMMUNITY ENERGY INITIATIVE LLC
14280 9TH STREET ZION, IL

SYSTEM SIZE (MW DC) **5.642**

Estimated Construction Costs				
Item	**Quantity**	**Units**	**Unit Cost**	**Total Cost**
Mobilizaiton	1	LS	$ 35,000	$ 35,000
Site Preparation	1	LS	$ 20,000	$ 20,000
Electrical Permits	1	LS	$ 1,500	$ 1,500
Building Permits	1	LS	$ 1,500	$ 1,500
Pole Removal: Utility Poles	3	EA	$ 2,500	$ 7,500
Pole Removal: Project Poles	4	EA	$ 2,000	$ 8,000
Pole Gear Removal: Meters & GOAB	1	LS	$ 3,000	$ 3,000
Underground Conduit Removal: AC&DC	1060	LF	$ 15.00	$ 15,900
Concrete Pads Removal	2	EA	$ 2,500	$ 5,000
Transformers Removal	2	EA	$ 3,000	$ 6,000
Inverters Removal	20	EA	$ 1,500	$ 30,000
Modules Removal	10075	EA	$ 1.00	$ 10,075
Racking Removal	1	LS	$ 20,500	$ 20,500
Foundation Post Removal	1875	EA	$ 4	$ 7,500
Fence Removal	5090	LF	$ 1.45	$ 7,381
Site Grading	10	AC	$ 500	$ 5,000
Hydroseeding and Mulch	25	AC	$ 250	$ 6,250
Solid Waste Transportation and Disposal (Dumpsters)	30	EA	$ 350	$ 10,500
Recycling Disposal Transportation (Palletized Truckloads)	50	EA	$ 250	$ 12,500
Construction Management	1	LS	$ 15,000	$ 15,000
Project Adminstration	1	LS	$ 7,414	$ 7,414
DECOMMISSIONING TOTAL				**$ 235,520**

NOTES:
LF= liner feet
CY = cubic yards
EA = each
AC = acres
LS = lump sum

eca solar

CONSTRUCTION COST CALCULATOR

RLB TPI % CHANGE

Calculates the construction cost differential between two selected dates.

ALTERNATIVE DATE (to date)

Mar 2024

RELATIVE TO

BASE DATE (from date)

Mar 2022

FOR

CHICAGO ×

CALCULATE

The resultant percentage indicates that the RLB TPI % change from March 2022 (base date) to March 2024 (alternative date) is:

Chicago	14.6%

IMPORTANT DISCLAIMER:

All data within this application for TPI by Date, TPI by location, Building Costs, and Market Activity are current as at Q4 2023 and are subject to change. The results shown are indicative only and are to be used as a guide only.

STANDARD SOLAR AGRICULTURAL IMPACT MITIGATION AGREEMENT

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Illinois Department of Agriculture
AGRICULTURAL SITE - REVIEW INFORMATION
For **Solar Projects** Requesting Agricultural Impact Mitigation Agreements

Return to: **Illinois Department of Agriculture**
Bureau of Land and Water Resources
[redacted]

Complete this Agricultural Site Review Information sheet and attach to each Solar Agricultural Impact Mitigation Agreement being submitted. Be sure to **include an aerial location map** delineating the site in relation to the city/village's corporate boundaries. **Email** all information to **AGR.AIMA@illinois.gov**

Date Submitted 3/26/2024

APPLICANT Zion Community Energy Initiative LI **County** Lake

Contact Person Bryan Morrison **Phone** [redacted]

Email [redacted]

List the project's contact person in the event that additional information is required. It is preferable to list the project's consultant and/or engineer since they usually possess the more detailed information needed to complete our review. The IDOA has a 30-day review period in which to provide comments to the applicant once all pertinent information has been received.

Address 203 Crescent Street, Suite 106

City Waltham, MA **ZIP** 02453

1. Number of acres in the site 70.99 TWP 46 Range 11 Section 11
2. Will the site me converted from an agricultural to a non-agricultural use? ☒ Yes ☐ No
3. Site is located within municipality's corporate boundaries ☐ Yes ☒ No
4. Distance of site to nearest incorporated municipal boundaries 0.5 miles
   (specify to nearest tenth-mile)

LAND USE

5. List the number of acres for each land use.
   Cropland 50.02 ac Pasture 0.0 ac Forest 20.97 ac Other 0.0 ac
   If ***Other,*** specify land use and land cover _____
6. County Permit issued? ☐ Yes ☐ No
7. Will other state or federal funds be used for this project? ☐ Yes ☒ No
   If **YES**, list the name(s) of participating agencies:

	state $	***federal $***
1) - _____	☐	☐
2) - _____	☐	☐

Submit by Email

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STANDARD AGRICULTURAL IMPACT MITIGATION AGREEMENT

between

Zion Community Energy Initiative LLC

and the

ILLINOIS DEPARTMENT OF AGRICULTURE

Pertaining to the Construction of a Commercial Solar Energy Facility

in

Lake County, Illinois

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

Zion Community Energy Initiative LLC, hereafter referred to as Commercial Solar Energy Facility Owner, or simply as Facility Owner, plans to develop and/or operate a _____ Commercial Solar Energy Facility in Lake County [GPS Coordinates: 42.485, -87.912], which will consist of up to 29.66 acres that will be covered by solar facility related components, such as solar panel arrays, racking systems, access roads, an onsite underground collection system, inverters and transformers and any affiliated electric transmission lines. This AIMA is made and entered between the Facility Owner and the IDOA.

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

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

Conditions of the AIMA

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Definitions

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

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

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

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

Construction and Deconstruction Standards and Policies

1. Support Structures

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

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

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

2. Aboveground Facilities

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

3. Guy Wires and Anchors

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

4. Underground Cabling Depth

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

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

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

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

1. Within the fenced perimeter of the Facility; or

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

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

5. Topsoil Removal and Replacement

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

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

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

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

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

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

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

6. Rerouting and Permanent Repair of Agricultural Drainage Tiles

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

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

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

C. **Maintaining Surrounding Area Subsurface Drainage**

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

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

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

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

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

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

7. Rock Removal

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

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

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

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

8. Repair of Compaction and Rutting

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

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

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

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

9. Construction During Wet Weather

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

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

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

10. Prevention of Soil Erosion

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

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

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

11. Repair of Damaged Soil Conservation Practices

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

12. Compensation for Damages to Private Property

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

13. Clearing of Trees and Brush

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

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

14. Access Roads

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

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

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

15. Weed/Vegetation Control

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

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

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

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

16. Indemnification of Landowners

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

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

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

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

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4. Transformers, inverters, energy storage facilities, or substations, including all components and foundations; however, Underground Cables at a depth of 5 feet or greater may be left in place;
5. Overhead collection system components;
6. Operations/maintenance buildings, spare parts buildings and substation/switching gear buildings unless otherwise agreed to by the Landowner;
7. Access Road(s) unless Landowner requests in writing that the access road is to remain;
8. Operation/maintenance yard/staging area unless otherwise agreed to by the Landowner; and
9. Debris and litter generated by Deconstruction and Deconstruction crews.

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

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

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

1. On or before the first anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
2. On or before the sixth anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
3. On or before the eleventh anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the Facility as determined in the updated Deconstruction Plan provided during the tenth year of commercial operation.

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

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

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

Concurrence of the Parties to this AIMA

The Illinois Department of Agriculture and Zion Community Energy Initiative LLC concur that this AIMA is the complete AIMA governing the mitigation of agricultural impacts that may result from the Construction and Deconstruction of the solar farm project in Lake County within the State of Illinois.

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

STATE OF ILLINOIS
DEPARTMENT OF AGRICULTURE

By: Jerry Costello II, Director

By Clay Nordsiek, Deputy General Counsel

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

_____, 20_____

Zion Community Energy Initiative LLC

DocuSigned by:
[redacted]
75EEAC7434024D6...

By Todd Fryatt

203 Crescent Street, Suite 106

Address

3/26/2024
_____, 2024

DocuSign Envelope ID: DDFFEAF1-6247-412F-98A3-BEA34EECF0D3

STATE AND MUNICIPALITY REFERENCES

Decommissioning Solar Panel Systems

Information for local governments and landowners on the decommissioning of large-scale solar panel systems.

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

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Overview

We provide information for local governments and landowners on the decommissioning of large-scale solar panel systems through the topics of decommissioning plans and costs and financial and non-financial mechanisms in land-lease agreements.

As local governments develop solar regulations and landowners negotiate land leases, it is important to understand the options for decommissioning solar panel systems and restoring project sites to their original status.

From a land use perspective, solar panel systems are generally considered large-scale when they constitute the primary use of the land and can range from less than one acre in urban areas to 10 or more acres in rural areas. Depending on where they are sited, large-scale solar projects can have habitat, farmland, and aesthetic impacts. As a result, large-scale systems must often adhere to specific development standards.

1. Abandonment and Decommissioning

Abandonment occurs when a solar array is inactive for a certain period of time.

- Abandonment requires that solar panel systems be removed after a specified period of time if they are no longer in use. Local governments establish timeframes for the removal of abandoned systems based on aesthetics, system size and complexity, and location. For example, the Town of Geneva, NY, defines a solar panel system as abandoned if construction has not started within 18 months of site plan approval, or if the completed system has been nonoperational for more than one year.[22]
- Once a local government determines a solar panel system is abandoned and has provided thirty (30) days prior written notice to the owner it can take enforcement actions, including imposing civil penalties/fines, and removing the system and imposing a lien on the property to recover associated costs.

Decommissioning is the process for removing an abandoned solar panel system and remediating the land.

- When describing requirements for decommissioning sites, it is possible to specifically require the removal of infrastructure, disposal of any components, and the stabilization and re-vegetation of the site.

1.1 Decommissioning Plans

Local governments may require having a plan in place to remove solar panel systems at the end of their lifecycle, which is typically 20-40 years. A decommissioning plan outlines required steps to remove the system, dispose of or recycle its components, and restore the land to its original state. Plans may also include an estimated cost schedule and a form of decommissioning security (see Table 1).

[22] Town of Geneva, N.Y. CODE § 130-4(D)(5) (2016):

1.2 Estimated Cost of Decommissioning

Given the potential costs of decommissioning and land reclamation, it is reasonable for landowners and local governments to proactively consider system removal guarantees. A licensed professional engineer, preferably with solar development experience, can estimate decommissioning costs, which vary across the United States. Decommissioning costs will vary depending upon project size, location, and complexity. Table 1 provides an estimate of potential decommissioning costs for a ground-mounted 2-MW solar panel system. Figures are based on estimates from the Massachusetts solar market. Decommissioning costs for a New York solar installation may differ. Some materials from solar installations may be recycled, reused, or even sold resulting in no costs or compensation. Consider allowing a periodic reevaluation of decommissioning costs during the project's lifetime by a licensed professional engineer, as costs could decrease, and the required payment should be reduced accordingly.

Table 1: Sample list of decommissioning tasks and estimated costs

Tasks	Estimated Cost ($)
Remove Rack Wiring	$2,459
Remove Panels	$2,450
Dismantle Racks	$12,350
Remove Electrical Equipment	$1,850
Breakup and Remove Concrete Pads or Ballasts	$1,500
Remove Racks	$7,800
Remove Cable	$6,500
Remove Ground Screws and Power Poles	$13,850
Remove Fence	$4,950
Grading	$4,000
Seed Disturbed Areas	$250
Truck to Recycling Center	$2,250
Current Total	**$60,200**
Total After 20 Years (2.5% inflation rate)	**$98,900**

2. Ensuring Decommissioning

Landowners and local governments can ensure appropriate decommissioning and reclamation by using financial and regulatory mechanisms. However, these mechanisms come with tradeoffs. Including decommissioning costs in the upfront price of solar projects increases overall project costs, which could discourage solar development. As a result, solar developers are sometimes hesitant to provide or require financial surety for decommissioning costs.

It is also important to note that many local governments choose to require a financial mechanism for decommissioning. Although similar to telecommunications installations, there is no specific authority to do so as part of a land use approval for solar projects (see Table 2). Therefore, a local government should consult their municipal attorney when evaluating financial mechanisms.

The various financial and regulatory mechanisms to decommission projects are detailed below.

Table 2: Relevant Provisions of General City, Town, and Village Laws Relating to Municipal Authority to Require Conditions, Waivers, and Financial Mechanisms

Site Plan Review	**General City Law**	**Town Law**	**Village**
Conditions	27-a (4)	274-a (4)	7-725-a (4)
Waivers	27-a (5)	274-a (5)	7-725-a (5)
Performance bond or other security	27-a (7)	274-a (7)	7-725-a (7)
Subdivision	**General City Law**	**Town Law**	**Village Law**
Waivers	33 (7)	277 (7)	7-730 (7)
Performance bond or other security	33 (8)	277 (9)	7-730 (9)
Special	**General City Law**	**Town Law**	**Village Law**
Conditions	27-b (4)	274-b (4)	7-725-b (4)
Waivers	27-b (5)	274-b (5)	7-725-b (5

Source: Referenced citations may be viewed using the NYS Laws of New York Online

Excerpts from these statutes are also contained within the "Guide to Planning and Zoning Laws of New York State," New York State Division of Local Governments Services, June 2011: https://www.dos.ny.gov/lg/publications/Guide_to_planning_and_zoning_laws.pdf

2.1 Financial mechanisms

Decommissioning Provisions in Land-Lease Agreements. If a decommission plan is required, public or private landowners should make sure a decommissioning clause is included in the land-lease agreement. This clause may depend on the decommissioning preferences of the landowner and the developer. The clause could require the solar project developer to remove all equipment and restore the land to its original condition after the end of the contract, or after generation drops below a certain level, or it could offer an option for the landowner to buy-out and continue to use the equipment to generate electricity. The decommissioning clause should also address abandonment and the possible failure of the developer to comply with the decommissioning plan. This clause could allow for the landowner to pay for removal of the system or pass the costs to the developer.

Decommissioning Trusts or Escrow Accounts. Solar developers can establish a cash account or trust fund for decommissioning purposes. The developer makes a series of payments during the project's lifecycle until the fund reaches the estimated cost of decommissioning. Landowners or third-party financial institutions can manage these accounts. Terms on individual payment amounts and frequency can be included in the land lease.

Removal or Surety Bonds. Solar developers can provide decommissioning security in the form of bonds to guarantee the availability of funds for system removal. The bond amount equals the decommissioning and reclamation costs for the entire system. The bond must remain valid until the decommissioning obligations have been met. Therefore, the bond must be renewed or replaced if necessary to account for any changes in the total decommissioning cost.

Letters of credit. A letter of credit is a document issued by a bank that assures landowners a payment up to a specified amount, given that certain conditions have been met. In the case that the project developer fails to remove the system, the landowner can claim the specified amount to cover decommissioning costs. A letter of credit should clearly state the conditions for payment, supporting documentation landowners must provide, and an expiration date. The document must be continuously renewed or replaced to remain effective until obligations under the decommissioning plan are met.

2.2 Nonfinancial mechanisms

Local governments can establish nonfinancial decommissioning requirements as part of the law. Provisions for decommissioning large-scale solar panel systems are similar to those regulating telecommunications installations, such as cellular towers and antennas. The following options may be used separately or together.

- **Abandonment and Removal Clause.** Local governments can include in their zoning code an abandonment and removal clause for solar panel systems. These cases effectively become zoning enforcement matters where project owners can be mandated to remove the equipment via the imposition of civil penalties and fines, and/or by imposing a lien on the property to recover the associated costs. To be most effective, these regulations should be very specific about the length of time that constitutes abandonment. Establishing a timeframe for the removal of a solar panel system can be based on system aesthetics, size, location, and complexity. Local governments should include a high degree of specificity when defining "removal" to avoid ambiguity and potential conflicts
- **Special Permit Application.** A local government may also mandate through its zoning code that a decommissioning plan be submitted by the solar developer as part of a site plan or special permit application. Having such a plan in place allows the local government, in cases of noncompliance, to place a lien on the property to pay for the costs of removal and remediation.
- **Temporary Variance/Special Permit Process.** As an alternative to requiring a financial mechanism as part of a land use approval, local governments could employ a temporary variance/special permit process (effectively a re- licensing system). Under this system, the locality would issue a special permit or variance for the facility for a term of 20 or more years; once expired (and if not renewed), the site would no longer be in compliance with local zoning, and the locality could then use their regular zoning enforcement authority to require the removal of the facility.

2.3 Examples of abandonment and decommissioning provisions

The New York State Model Solar Energy Law provides model language for abandonment and decommissioning provisions in the Model Law section of this Guidebook.

The following provide further examples that are intended to be illustrative and do not confer an endorsement of content:

- Town of Geneva, N.Y., § 130-4(D): ecode360 .com/28823382
- Town of Olean, N.Y., § 10.25.5: https://www.cityofolean.org/council/minutes/ccmin2015-04-14.pdf

2.4 Checklist for Decommissioning Plans

The following items are often addressed in decommissioning plans requirements:

- Defined conditions upon which decommissioning will be initiated (i.e., end of land lease, no operation for 12 months, prior written notice to facility owner, etc.).
- Removal of all nonutility owned equipment, conduit, structures, fencing, roads, and foundations.
- Restoration of property to condition prior to solar development.
- The timeframe for completion of decommissioning activities.
- Description of any agreement (e.g., lease) with landowner regarding decommissioning.
- The party responsible for decommissioning.
- Plans for updating the decommissioning plan.
- Before final electrical inspection, provide evidence that the decommissioning plan was recorded with the Register of Deeds.

Questions?

If you have any questions regarding the decommissioning of solar panels, please email questions to cleanenergyhelp@nyserda.ny.gov or request free technical assistance at nyserda.ny.gov/SolarGuidebook. The NYSERDA team looks forward to partnering with communities across the state to help them meet their solar energy goals.

Solar Decommissioning Template

ADOPTED AS A

BOARD OF PLANNING AND COMMUNITY DEVELOPMENT RULE AND REGULATION

FEBRUARY 8, 2018

As part of any application for approval of Ground-Mounted Solar Photovoltaic Installations, applicants are required to provide a form of surety in accordance with the process outlined in Section 3.24.12.3 of the Athol Zoning Bylaw. Below is a list of labor rates and equipment rates that are to be used in calculating the total cost of Decommissioning the ground-mounted solar photovoltaic installation site. The labor (and equipment) rates are based on the prevailing wages for the Athol area. For more information, please visit the Mass. Department of Labor Standard's Prevailing Wage Program website at: https://www.mass.gov/prevailing-wage-program

General Labor	$50 per hour	or $2000 per week
Trucking Cost	$110 per hour	or $4400 per week
Bobcat Cost	$31.25 per hour	or $1250 per week
Grader Cost	$100 per hour	or $4000 per week
Front End Loader/Excavator Cost	$135 per hour	or $5400 per week
Backhoe Cost	$160 per hour	or $6400 per week

The General Labor rate is a guideline. If prevailing wage rates are higher than that figure is the labor rate that should be used. Conversely if prevailing wage rates are lower than they can be used subject to proof of State prevailing wage rate data. For General Labor, the amount shown does include health care and pension expenses.

Below is a list of typical Decommissioning tasks that are to be performed. Depending on the site construction the actual tasks performed may differ from the list shown. All tasks are to be prepared by a qualified engineer. Also, recycling shall be neutral. Costs such as disposal or tipping fees shall be covered by the value of the disposed equipment. Nothing gained or lost. Therefore, the decommissioning cost shall be determined by the cost of dismantling and loading the site materials in addition to the trucking costs.

- Remove Rack Wiring
- Remove Cable
- Remove Panels
- Dismantle Racks
- Remove and Load Racks plus Trucking
- Remove Electrical Equipment plus Trucking
- Breakup and Remove Concrete Pads and Ballasts
- Remove Power Poles
- Remove Fence plus Trucking
- Grading
- Seed Disturbed Areas
- Additional Trucking Costs (Panels, Concrete, etc) plus fuel.

Note: It has been determined that no disconnect fee needs to be paid to the Electric Company, National Grid.

Each task within the Decommissioning process provided to the Planning Board shall have a very short description of the task. Following the description there shall be a formula for the task. Then the formula shall be used to determine the final cost for the task as in the example shown below.

Remove Panels task:

Description --- ----The panels are clamped in. They slide in a rack. A laborer needs to unclamp the panel and reach over and slide the panel out of the track. It takes approximately 3 minutes to remove each panel. There are 15,000 panels.

Formula --- number of panels divided by 20 times the General Labor Rate
--- 15,000 divided by 20 times $50 = $37,500

At the end of the document all of the costs shall be added up as in the example shown below. Also, the inflation adjusted amount after 20 years shall be shown. The example is for a 5 mW system.

Total Decommissioning costs based on an example 5 Mw system.

Remove Rack Wiring	$ 8,274
Remove Cable	$12,256
Remove Panels	$37,500
Dismantle Racks	$13,790
Remove and Load Racks plus Trucking	$51,570
Remove Electrical Equipment plus Trucking	$8,572
Breakup and Remove Concrete Pads and Ballasts	$2,720
Remove Power Poles	$3,000
Remove Fence plus Trucking	$19,443
Grading	$3,000
Seed Disturbed Areas	$810
Additional Trucking Costs (Panels, Concrete, etc) plus fuel	$14,700
Total Cost	$175,635
Total Cost after 20 years at 2.5% inflation Rate	$287,798

Note: The inflation calculation uses compounded interest. In addition, the Board of Planning and Community Development reserves the right to increase the financial surety amount up to 125% of the cost of removal based on the decommissioning estimate in accordance with Section 3.24.12.3 of the Athol Zoning Bylaw.

The initial estimate amount provided by the Applicant with the Application submission shall be reviewed by the DPW and/or Planning Board Peer Reviewing Engineer (if any). The Applicant shall pay for the cost of this review with such payment being provided by the applicant prior to issuance of a decision by the Planning Board. The surety agreement shall be established prior to issuance of Building Permit

Note: The surety can either be the final 20-year value or it can be renewed each year at that year's amount. If the surety is received at the new amount each year, a system needs to be in place to ensure that the new surety is received each year. Also, if the surety is to be renewed each year then each year's amount is to be shown in the decommissioning document.

Note: The labor and equipment rates shall be reviewed every three years by the DPW and Planning Board Peer Reviewing Engineer (if any). Also, the recycling market shall be reevaluated every three years. If the DPW or the Planning Board's Peer Review Engineer recommends that a change is required then this document will be modified. Included in the review, if there is a significant increase to the inflation rate, the Board reserves the right to set a higher inflation rate to determine the total Decommissioning costs over 20 years.

The review does not affect already installed solar installations.

The Board of Planning and Community Development, February 8, 2018

REFERENCE PROJECT DECOMMISIONING COST ESTIMATES

4.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report, 2022 average market values were used to estimate labor expenses. Fluctuation and inflation of the labor costs were not factored into the estimates.

4.1 DECOMMISSIONING EXPENSES

Project decommissioning will incur costs associated with disposal of components not sold for salvage, including materials which will be disposed of at a licensed facility, as required. Table 3 summarizes the estimates for activities associated with the major components of the Project. Cost of equipment removal would be higher if retaining for resale rather than salvage; however, the increased revenue would offset the added costs. The total estimated decommissioning cost in Table 3 also covers costs for backfilling, grading and restoration as described in Section 2. Elk Creek Solar will execute a purchase option on a parcel described in this report as the Northern Purchase Option Parcel (Northern Parcel). The Northern Parcel will contain the substation, O&M facilities, stormwater basin, panels, and trackers. Table 3 provides a summary of all Project facilities regardless of location. Table 4 provides a breakdown of the decommissioning costs for facilities located exclusively on the Northern Parcel.

Table 3 Estimated Decommissioning Expenses – Entire Project

Activity	Unit	Quantity	Cost per Unit	Total
Overhead and management (includes estimated permitting required)[1]	Lump Sum	1	$1,669,000	$1,669,000
Solar modules; disassembly and removal[1]	Each	764,504	$4.60	$3,516,718
Tracking System disassembly and removal (equivalent full trackers)[1]	Each	9,802	$625	$6,126,250
Steel pile/post removal[1]	Each	138,332	$9.70	$1,341,820
Transformers and inverters[2]	Each	92	$1,600	$147,200
Battery pack and container removal[2]	Each	736	$382	$281,152
BESS and Inverter foundation removal (8 containers per foundation)[2]	Each	92	$10,199	$938,308
Access road excavation and removal[1]	Lump Sum	1	$348,900	$348,900
Stormwater basin removal[3]	Lump Sum	1	$29,267	$29,267
Topsoil replacement and rehabilitation of site[1]	Lump Sum	1	$1,184,400	$1,184,400
Perimeter fence removal[1]	Linear Feet	131,107	$2.80	$367,100
Overhead Transmission Line[3]	Lump Sum	1	$8,000	$8,000

DECOMMISSIONING COST ESTIMATE SUMMARY

Activity	Unit	Quantity	Cost per Unit	Total
Project Substation (two transformers)[3]	Lump Sum	1	$450,000	$450,000
Total estimated decommissioning cost without BESS recycling				**$16,408,115**
BESS packaging and shipping (for recycling)[2]	Lump Sum	1	$1,947,140	$1,947,140
BESS recycling[2]	Lump Sum	1	$5,236,096	$5,236,096
Total estimated decommissioning cost including BESS recycling				**$23,591,351**

[1] Facilities located on all parcels; see Table 4 for breakdown of facilities on Northern Parcel only.
[2] Facilities not located on Northern Parcel
[3] Facilities located exclusively on Northern Parcel

Table 4 Estimated Decommissioning Expenses – Northern Parcel Only

Activity	Unit	Quantity	Cost per Unit	Total
Overhead and management (includes estimated permitting required)	Lump Sum	1	$58,000	$58,000
Solar modules; disassembly and removal	Each	5,018	$4.60	$23,083
Tracking System disassembly and removal (equivalent full trackers)	Each	65	$625	$40,625
Steel pile/post removal	Each	910	$9.70	$8,827
Access road excavation and removal	Lump Sum	1	$4,300	$4,300
Topsoil replacement and rehabilitation of site	Lump Sum	1	$11,900	$11,900
Stormwater basin removal	Lump Sum	1	$29,267	$29,267
Perimeter fence removal	Linear Feet	2,342	$2.80	$6,558
Overhead Transmission Line	Lump Sum	1	$8,000	$8,000
Project Substation (two transformers)	Lump Sum	1	$450,000	$450,000
Total estimated decommissioning cost				**$640,560**

4.2 DECOMMISSIONING REVENUES

Revenue from decommissioning the Project will be realized through the sale of the solar facility components and construction materials. As previously described, the value of the decommissioned components will be higher in the early stages of the Project and decline over time. The resale value of components such as battery units and solar panels is expected to be greater than salvage (i.e., scrap) value for most of the life of the Project.

Depending on market conditions and the age and condition of the BESS facilities at time of decommissioning, there will likely be resale or salvage value in the components. Battery energy storage systems will retain a significant resale value during the early phases of their life cycle. During the first 10 years of the Project, BESS units, or the individual battery cells, could be sold for re-use or returned to the manufacturer for recycling. It is estimated that the battery units' value during the first ten years of the Project life would offset (or exceed) the cost of preparation and shipping. Although additional revenue due to resale may be generated during this stage of the Project, these revenues are not reflected in Table 5. During later stages of the Project, the value of the battery components, such as lithium, copper, aluminum, and steel, would be extracted during recycling to provide an offset to the disposal costs.

Modules and other solar plant components may be sold within a secondary market for re-use. A current sampling of reused solar panels indicates a wide range of pricing depending on age and condition ($0.10 to $0.40 per watt). Future pricing of solar panels is difficult to predict, due to the relatively young age of the market, changes to solar panel technology, and the ever-increasing product demand. A conservative estimation of the value of solar panels at $0.10 per watt would yield $42,050,000. Increased costs of removal, for resale versus salvage, would be expected to preserve the integrity of the panels; however, the net revenue would be substantially higher than the estimated salvage value.

The resale value of components such as trackers may decline more quickly; however, the salvage value of the steel that makes up a large portion of the tracker is expected to stay at or above the value used in this report.

The market value of steel and other materials fluctuates daily and has varied widely over the past five years. Salvage value estimates were based on an approximate five-year-average price of steel and copper derived from sources including on-line recycling companies and United States Geological Survey (USGS) commodity summaries. The price used to value the steel used in this report is $241 per metric ton; aluminum at $0.40 per pound; silicon at $0.40 per pound and glass at $0.05 per pound. The main component of the tracking system and piles is assumed to be salvageable steel.

Solar panels are estimated to contain approximately 75 percent glass, 8 percent aluminum and 5 percent silicon. A 50 percent recovery rate was assumed for aluminum and all panel components, due to the processing required to separate the panel components. Alternative and more efficient methods of recycling solar panels are anticipated before this Project is decommissioned, given the large number of solar facilities that are currently being developed. Table 5 summarizes the potential salvage value for the solar array components and construction materials.

Table 5 Estimated Solar Decommissioning Revenues (Salvage Value Only)

Item	Unit	Salvage Price per Unit	Units per Item	Total Salvage Price per Item	Number of Items	Total
Solar Array Components						
Panels - Silicon	Average Pounds per Panel (Item)	$0.40	1.7	$0.680	764,504	$519,863
Panels - Aluminum	Average Pounds per Panel (Item)	$0.40	2.8	$1.120	764,504	$856,244
Panels - Glass	Average Pounds per Panel (Item)	$0.05	26.1	$1.305	764,504	$997,678
Tracking System and Posts	Tons per $MW_{[AC]}$	$241	32.0	$7,712	420.50	$3,242,896
Substation	Each	$75,000	1	$75,000	1	$75,000
Total potential revenue (solar components only)						**$5,691,681**

* Revenue based on salvage value only. Revenue from used panels at $0.10 per watt could raise $42,050,000 as resale versus the estimated salvage revenue.

The revenue of the equipment located exclusively on the Northern Parcel would total **$111,865** (tracking system and posts - $21,285; panels - $15,580; substation - $75,000).

4.3 DECOMMISSIONING COST SUMMARY

Table 6 provides a summary of the net estimated cost to decommission the Project, using the information detailed in Sections 4.1 and 4.2. Estimates are based on 2022 prices, with no market fluctuations or inflation considered.

Table 6 Net Decommissioning Summary

Item	Cost/Revenue
Decommissioning Expenses (including estimated BESS transportation and recycling at end-of-life)	**$23,591,351**
Potential Revenue – salvage value of panel components and recoverable materials	**$5,691,681**
Net Decommissioning Cost (including estimated BESS transportation and recycling at end-of-life)	**$17,899,670**

Appendix 2
Breakdown of Decommissioning Costs

Applicant submits this breakdown of the Estimated Decommissioning Cost to support the proposed decommissioning fund of $211,381 for the project based on 2019 cost of work estimates following the NYSERDA guidance which is based on the estimating practices followed by the State of Massachusetts and New York Southeast scrap value prices

It should be further noted that while the Decommissioning Fund is established in the amount equal to the gross decommissioning costs of $211,381.00, there will likely be significant salvage value that would make the net system decommissioning cost lower than the proposed Decommissioning Fund amount.

To better explain the potential salvage value for this project we have completed a more detailed analysis of the current value of the main project components:
solar panels, racking system aluminum/steel content and the electric cabling copper/aluminum content. The current published values for these materials can have a fairly large spread. For each item we chose to use the most conservative pricing available as an assumption of the current worst case scenario. As you can see from the summary analysis the current salvage value is 3 times higher than the proposed decommissioning cost.

Estimated Decommissioning Cost				
	Type	Quantity	Cost Per Item	Total
Fence Removal with Gate and CCTV	LF	7,618	$4.50	$34,281.00
Remove Transformers & Concrete Pads	Each	2	$5,000.00	$10,000.00
Remove Major Switch Gear & Concrete Pad	Each	1	$5,000.00	$5,000.00
Remove Modules and Racking	$/MWac	5	$9,000.00	$45,000.00
Removal of Posts	Each	1,975	$20.00	$39,500.00
Remove & Dispose String Inverters, Storage and DC Converters	Each	60	$300.00	$18,000.00
Removal of Underground Wires and Backfill	LF	3,500	$10.00	$35,000.00
Site Restoration, Grade and Seed	Acre	10	$900.00	$9,000.00
Removal of Gravel Access Road	Cubic Yards	624	$25.00	$15,600.00
Current Total:				$211,381.00
Total after 25 years of inflation (2.5% inflation rate)				$346,372.38
Detailed Salvage Value	Solar Panels	45,455	$6.60	$300,003.00
	Racking Steel (lbs)	1,168,100.00	$0.05	$58,405.00
	Racking Aluminum (lbs)	1,760,000.00	$0.15	$264,000.00
	Project Cabling (lbs)	75,931.00	$0.73	$55,429.63
Total Salvage Value				$677,837.63
Proposed decommissioning fund				$211,381.00

Sunfish Solar
Orange County, VA
Decommissioning Estimate Pro Forma

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

LS = Lump Sum, HR = Hours, EA = Each, LF = Linear Feet.

Item	Quantity	Unit	Unit Price	Total Cost (incl. markups)
Mobilization	1	LS		$108,090
Administration	500	HR	$108	$53,789
Temporary Facilities	1	LS		$13,360
Safety	1	LS		$9,050
Legal Expenses	1	LS		$2,380
General Liability Insurance	1	LS		$9,700
Contractor's G&A	1	LS		$18,320
SWPPP, Erosion Control Measures (Disturbed Area)	431	Ac	$670	$288,664
Seeding	22	Ac	$1,508	$32,482
Tilling 6" topsoil/scarifying access road and rough grading existing soil	22	Ac	$664	$14,296
Remove and Recycle Chain link Fence, 6' High	102,062	LF	$3.46	$352,919
Disconnection and Demolition of Switchyard/Substation Equipment	1	EA	$74,797	$74,797
Removal and Recycle AC Cables	90,000	LF	$0.19	$17,309
Removal and Recycle Above Ground DC Cables	6,292,884	LF	$0.09	$592,714
Removal and Recycle Under Ground DC Cables	200,000	LF	$0.11	$21,047
Backfill AC and DC trenches	290,000	LF	$0.19	$53,942
Removal and Recycle of Combiner boxes	260	EA	$238.44	$61,994
Remove and Recycle Inverters	20	EA	$6,935	$138,692
Removed and Recycle Photovoltaic Modules	180,830	EA	$1.87	$337,959
Remove and Recycle Piles (10' W6x7 piles @ 25' OC assumed)	38,431	EA	$3.49	$134,258
Remove and Recycle Support Assemblies	1,774,024	LB	$0.02	$33,634
Contaminated Soils Testing	1	LS		$2,000
Reclamation Monitoring and Maintenance	1	LS		$5,000
			Year 20 cost in 2023 Dollars	**$2,376,000**
			Projected inflation (1.5%)	**$824,000**
			Year 20 cost in 2043 Dollars	**$3,200,000**

General Notes:

1. Similarly sized sites were used to derive potential quantities for erosion and sediment control. Quantities were determined by comparing "unit/MW" quantities directly.
2. Labor productivity and unit rates were derived from BLS 2023.
3. Labor, material, and equipment rates are based on the nearest available RS Means City Cost Index (CCI).
4. Equipment rental rates were determined from local rental facilities.
5. Assumption of module quantity from preliminary layout using 180830 modules.

4.0 DECOMMISSIONING COST ESTIMATE SUMMARY

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report approximate 2020 average market values were used to estimate labor expenses. Fluctuation and inflation of the labor costs were not factored into the estimates.

4.1 DECOMMISSIONING EXPENSES

Project decommissioning will incur costs associated with disposal of components not sold for salvage, including materials which will be disposed of at a licensed facility, as required. Decommissioning costs also include backfilling, grading and restoration of the Project site as described in Section 2. Table 3 summarizes the estimates for activities associated with the major components of the Project.

Table 3 Estimated Decommissioning Expenses – 300 MW_{AC} Solar Array

Activity	Unit	Quantity	Cost per Unit	Total
Overhead and management (includes estimated permitting required)	Lump Sum	1	$1,380,000	$1,380,000
Public road repair	Lump Sum	1	$391,000	$391,000
Solar modules disassembly and removal	Each	635,584	$3.75	$2,383,440
Tracking System disassembly and removal (equivalent 3-string trackers)	Each	9,931	$620.00	$6,157,220
Steel pile/post removal	Each	141,590	$9.50	$1,345,105
Remove buried DC cable	Linear Feet	832,900	$0.40	$332,880
Removed above and below ground AC cable	Linear Feet	183,432	$0.40	$73,372
Transformers and inverter removal	Each	95	$1,100	$104,500
Concrete pad at inverter removal	Each	95	$1,250	$118,750
Access road excavation and removal	Lump Sum	1	$351,407	$351,407
Perimeter fence removal	Linear Feet	220,900	$2.80	$618,520
Topsoil replacement for roads and rehabilitation of site	Lump Sum	1	$1,561,100	$1,561,100
Removed above ground transmission line and poles	Linear Mile	0.05	$250,000	$12,500
Project substation (two transformers)	Each	1	$450,000	$450,000
Total estimated decommissioning cost				**$15,279,794**

4.2 DECOMMISSIONING REVENUES

Project revenue will be realized through the sale of the solar facility components and construction materials. Modules and other components may be sold within a secondary market or as salvage. The market value of steel and other materials fluctuates daily and has varied widely over the past five years. Salvage value estimates were based on an approximate five-year-average price of steel and copper derived from sources including on-line recycling companies and United States Geological Survey (USGS) commodity summaries. The price used to value the steel used in this report is $253 per metric ton; aluminum at $0.40 per pound; silicon at $0.40 per pound and glass at $0.05 per pound. The main component of the racking system and piles is assumed to be salvageable steel. Solar panels are estimated to contain approximately 75 percent glass, 8 percent aluminum and 5 percent silicon. A 50 percent recovery rate was assumed for aluminum and all panel components due to the processing required to separate the panel components. Alternative and more efficient methods of recycling solar panels are anticipated before this Project is decommissioned given the large number of solar facilities that are currently being developed. Table 4 summarizes the potential salvage value for the solar array components and construction materials.

Table 4 Estimated Decommissioning Revenues

Item	Unit of Measurement	Quantity per Unit	Salvage Price per Unit	Total Salvage Price per Item	Number of Items	Total
Panels - Silicon	Pounds per Panel	1.9	$0.40/lb	$0.760	635,584	$483,044
Panels - Aluminum	Pounds per Panel	3.1	$0.40/lb	$1.240	635,584	$788,124
Panels - Glass	Pounds per Panel	29.2	$0.05/lb	$1.460	635,584	$927,953
Collection Cabling - Aluminum	Pounds per 1,000 feet	833	$0.19/lb	$158.27	1,015.63	$160,744
Tracking System and Posts	Metric Tons per MW_{AC}	40	$253/MT	$10,120	300	$3,036,000
Substation	Each	1	$50,000	$50,000	1	$50,000
						$5,445,865

4.3 DECOMMISSIONING COST SUMMARY AND FINANCIAL ASSURANCE

The following is a summary of the net estimated cost to decommission the Project, using the information detailed in Sections 4.1 and 4.2. Estimates are based on 2020 prices, with no market fluctuations or inflation considered.

Table 5 Net Decommissioning Summary

Item	Cost/Revenue
Decommissioning Expenses	$15 279,794
Potential Revenue – salvage value of panel components are recoverable materials	$5 445,865
Net Decommissioning Cost	**$9,833,929**

Fearing Hill Road Solar Project Decommissioning Estimate
Wareham, MA
May 17, 2021
Revised: June 9, 2022

System Information Summary	
Total System Module Count	15498
Total System Inverter Count	~38
Racking Orientation	2 Up Vertical
Linear Feet of Racking	11620.2
Estimated Aluminum per Foot of Racking (lbs)	2
Estimated Steel Per Foot of Racking (lbs)	4.5
Estimated Length of Interconnection to Street (feet)	527
Anticipated Project Lifestpan for Inflation Calcuation (years)	25

Decommissioning Summary		
Estimated Business Days to Demolish (8 Man Crew - Rate of 300 modules, 2 Inverters & 500 Linear Feet of Racking/Day)	46	
Estimated Total Number of 40 Yard Dumpsters (400 Modules/2INV/Miscellaneous Debris Per Container)	39	
Dumpster Disposal Cost ($650 per Container)	$	25,350.00
Cost for Demolition Crew ($225/Day/Member)	$	82,800.00
Heavy Equipment ($950/Day)	$	43,700.00
Solar Racking Foundation & Utility Pole Removal - Assuming the complete removal of solar racking foundations - including subsurface (8 Man Crew/10 Days)	$	18,000.00
Solar Racking Foundation & Utility Pole Removal - Assuming racking foundation removal to ground level only - if site conditions necessitate (8 Man Crew/6.5 Days)	$	11,700.00
Perimeter Fencing - Including removal of footings for posts ($1.50/foot for ±4,332 feet of fencing)	$	6,498.00
Estimated Mobilization & Site Repair - Includes revegetation of site (5% of Costs)	$	9,402.40
Total Current Day Decommissioning Estimate - Assuming that solar racking foundations will be removed to ground level	**$**	**179,450.40**
Total Current Day Decommissioning Estimate - Assuming that solar racking foundations will be completely removed	**$**	**185,750.40**