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List of Acronyms

AC	alternating current
ALTA	American Land Title Association
BBS	Breeding Bird Survey
BMPs	Best Management Practices
BWSR	Minnesota Board of Soil and Water Resources
CON	Certificate of Need
dB	decibel
dbA	A-weighted sound level in decibels
DC	direct current
DNR	Minnesota Department of Natural Resources
ECS	Ecological Classification System
ELF	extremely low frequency
EMF	Electromagnetic Fields/Electric and Magnetic Fields
EPA	U.S Environmental Protection Agency
EPC	Engineering, Procurement, Construction
FEMA	Federal Emergency Management Agency
FPDC	Fleet Performance Diagnostics Center
HVTL	High Voltage Transmission Line
ITC	Investment Tax Credit
KOP	Key Observation Points
kV	kilovolts
mG	milligauss
MISO	Midwest Independent System Operator
MnDOT	Minnesota Department of Transportation
MNGeo	Minnesota GeoSpatial Information Office
MW	megawatt
NAC	Noise Area Classifications
NESC	National Electric Safety Code
NHIS	Natural Heritage Information System
NLCD	National Land Cover Dataset
NPDES	National Pollutant Discharge Elimination System Permit
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSP	Northern States Power Company
O&M	operation and maintenance
OTP	Ottertail Power Company
PCA	Minnesota Pollution Control Agency
PCS	power conversion station
PPA	Power Purchase Agreement
PUC	Minnesota Public Utilities Commission
PV	photovoltaic

PWI	Public Water Inventory
RFP	Request for Proposal
ROW	Right-of-Way
SPCC	Spill Prevention Control and Countermeasure Plan
SSURGO	Soil Service Geographic Database
SWCD	Soil and Water Conservation District
SWPPP	Stormwater Pollution Prevention Plan
µT	microtesla
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMA	Wildlife Management Areas
V/m	volts per meter

Application Completeness Checklist

Marshall Solar, LLC ("Marshall Solar") is submitting this Application for a Site Permit for the Marshall Solar Energy Project (the "Project"), a 62.25 megawatt ("MW") solar energy facility that would be located near Marshall, Minnesota. Because the Marshall Solar Energy Project will be a large electric power generating plant that generates electricity from solar energy, the Project is eligible to be permitted by the Minnesota Public Utilities Commission ("Commission") pursuant to the alternative site permitting process, as provided for in Minn. Stat. § 216E.04, subd. 2.

As required by Minnesota Rules part 7850.2800, subpart 2, by letter dated December 19, 2014, Marshall Solar notified the Commission of Marshall Solar's intent to submit an Application for a Site Permit for the Marshall Solar Energy Project under the alternative permitting process set forth in Minnesota Rules parts 7850.2800 to 7850.3900.

In relevant part, Minn. R. 7850.3100 provides that an "applicant shall include in the application the same information required in part 7850.1900, except the applicant need not propose any alternative sites or routes to the preferred site or route."

Table 1 below provides a summary of what information is required pursuant to part 7850.1900 and where in the Application the information can be found.

Table 1. Completeness Checklist

Rule	Description	Location in Document
7850.1900	**Application Contents**	
Subpart 1		
A.	a statement of proposed ownership of the facility as of the day of filing and after commercial operation;	Section 1.2.1
B.	the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated;	Section 1.2.2
C.	at least two proposed sites for the proposed large electric power generating plant and identification of the applicant's preferred site and the reasons for preferring the site;	Not Applicable under the Alternative Process
D.	a description of the proposed large electric power generating plant and all associated facilities, including the size and type of the facility;	Section 2.1, 2.2; 2.3; Chapter 3
E.	the environmental information required under subpart 3;	See below.
F.	the names of the owners of the property for each proposed site;	Section 1.2.1
G.	the engineering and operational design for the large electric power generating plant at each of the proposed sites;	Section 3.1
H.	a cost analysis of the large electric power generating plant at each proposed site, including the costs of constructing and operating the facility that are dependent on design and site;	Section 2.5
I.	an engineering analysis of each of the proposed sites, including how much each site could accommodate expansion of generating capacity in the future;	Section 2.6; 3.1

Rule	Description	Location in Document
7850.1900	**Application Contents**	
J.	identification of transportation, pipeline, and electrical transmission systems that will be required to construct, maintain, and operate the facility;	Section 3.1; 3.2
K.	a listing and brief description of federal, state, and local permits that may be required for the project at each proposed site; and	Section 1.4
L.	a copy of the Certificate of Need for the project from the Public Utilities Commission or documentation that an application for a Certificate of Need has been submitted or is not required.	Section 1.4
Subpart 2.	Route Permit for HVTL	Section 3.1.3
Subpart 3.	Environmental Information	
A.	a description of the environmental setting for each site;	Section 4.1
B.	a description of the effects of construction and operation of the facility on human settlement, including but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services;	Section 4.2
C.	a description of the effects of the facility on land-based economies, including but not limited to, agriculture, forestry, tourism, and mining;	Section 4.3
D.	a description of the effects of the facility on archaeological and historic resources;	Section 4.4
E.	a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna;	Section 4.5
F.	a description of the effects of the facility on rare and unique natural resources;	Section 4.6
G.	identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site; and	Chapter 4
H.	a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures.	Chapter 4

1 Introduction

Marshall Solar, LLC ("Marshall Solar") is pleased to submit this Application for a Site Permit for the Marshall Solar Energy Project (the "Project"), a 62.25 megawatt ("MW") solar energy facility that would be located near Marshall, Minnesota. Marshall Solar is a wholly owned subsidiary of NextEra Energy Resources, LLC ("NextEra").

The Marshall Solar Energy Project will be sited on approximately 510 acres of agricultural land approximately four miles east of Marshall, Minnesota in Lyon County. The Project will interconnect to the adjacent Lyon County Substation owned and operated by Northern States Power Company, dba, Xcel Energy ("NSP" or "Xcel"). Marshall Solar selected this site due to its close proximity to existing and planned transmission facilities, existing road infrastructure, and flat, unobstructed terrain. Importantly, in selecting the site, Marshall Solar also concluded that its development will not result in significant environmental impacts.

In order to utilize the 30 percent Federal Investment Tax Credit ("ITC") available to eligible solar projects, Marshall Solar plans to start construction of the Project in spring 2016, with commercial operation occurring prior to the end of 2016. To meet this construction schedule, Marshall Solar respectfully requests that a Site Permit be issued for the Marshall Solar Energy Project no later than January 2016. Marshall Solar looks forward to working with the Commission and the Department of Commerce to complete the review of this Application to meet this date.

1.1 Purpose and Need

In April 2014 NSP issued a Request for Proposal ("RFP") seeking to acquire up to 100 MW of large-scale photovoltaic ("PV") solar generation resources from projects having a combined capacity of five MW (alternating current ["AC"]) or larger. Projects solicited through this RFP process were sought to fulfill the requirements of the Solar Energy Standard in Minnesota as set forth in Minn. Stat. § 216B.1691, Subd. 2f, which requires 1.5 percent of a public utility's 2020 retail sales to come from solar energy resources. NSP required a Power Purchase Agreement ("PPA") for solicited projects.

Marshall Solar, LLC submitted a proposal for the Marshall Solar Energy Project in response to NSP's RFP. NSP selected the Project and on October 24, 2014 filed a request with the Commission seeking approval of the Project's PPA in Docket No.: E-002/M-14-162. At its February 12, 2015 agenda meeting, the Commission orally approved the PPA between NSP and Marshall Solar. A written order from the Commission is pending.

1.2 Applicant Information

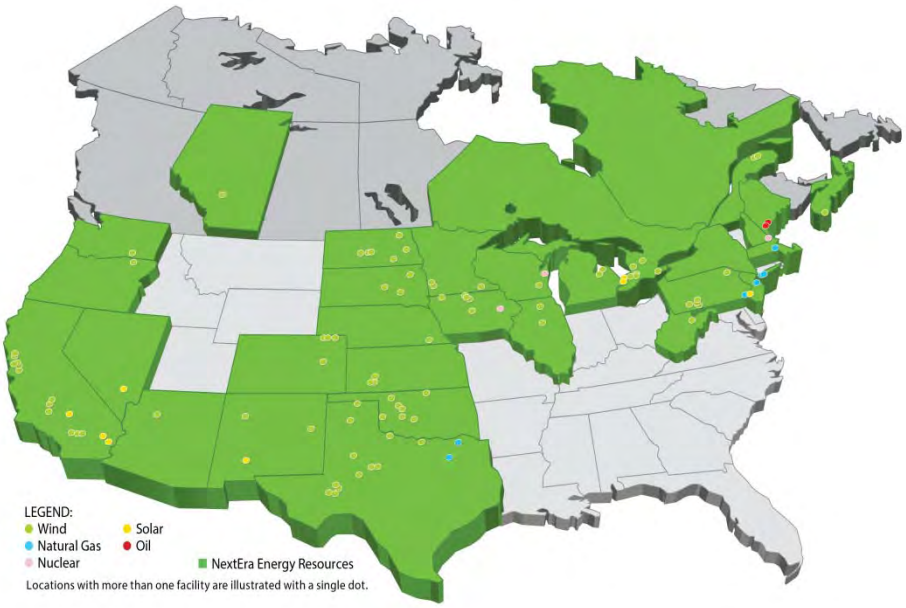
1.2.1 Statement of Proposed Ownership

Marshall Solar is a Delaware limited liability company authorized to conduct business in Minnesota. Marshall Solar is a wholly-owned subsidiary of NextEra Energy Resources, LLC. NextEra Energy Resources is a wholly-owned subsidiary of NextEra Energy, Inc.

NextEra is one of the largest generators of solar energy in the United States and currently owns and operates approximately 771 MW of solar facilities in the United States, Canada, and Spain.

NextEra's commitment to solar is consistent with its long track record of developing, owning, and operating renewable energy resources. This commitment has allowed NextEra, through its affiliates, to become the largest generator of wind and solar power in North America, with nearly 120 facilities in operation in 26 states and four Canadian provinces with a capacity of over 18,000 MW. Approximately 95 percent of the electricity generated by NextEra's facilities comes from clean or renewable fuels. Figure 1-1 shows the facilities currently in operation.

Figure 1-1 NextEra Energy Facilities in Operation



NextEra has a long-term commitment to both wind and solar with an outlook to significantly expand its fleet of clean energy generating capacity; the Marshall Solar Energy Project will further this goal. The Project also continues NextEra's commitment to renewable energy in Minnesota through a long-standing partnership with Xcel Energy and its affiliate companies with operations in the State of Minnesota. Affiliates of NextEra currently have three wind facilities in operation within Minnesota – all under long-term PPAs with NSP.[1]

Marshall Solar has negotiated options to purchase the land rights necessary to build the Project once permitted and, after exercising such rights, would hold title to the land and own all of the improvements on the property for the duration of the Project's useful life.

[1] NextEra's affiliates own and operate the Lake Benton II wind farm in Pipestone County; Mower County Wind in Mower County; and the Buffalo Ridge wind farm in Lincoln County.

1.2.2 Permittee Information

The Permittee for this Site Permit is:

Marshall Solar, LLC
700 Universe Boulevard
Juno Beach, Florida, 33408

1.2.3 Contact persons for the Applicant

Brandon Stankiewicz, Director – Development
NextEra Energy Resources, LLC
700 Universe Boulevard
Juno Beach, Florida, 33408
Telephone: (561) 304-5775
Brandon.stankiewicz@nee.com

-and-

Brian M. Meloy
Andrew Gibbons
Stinson Leonard Street
150 South Fifth Street, Suite 2300
Minneapolis, Minnesota 55402
Telephone: (612) 335-1500
brian.meloy@stinsonleonard.com
andrew.gibbons@stinsonleonard.com

1.3 Project Schedule

As previously noted, in order to utilize the 30 percent Federal ITC and pass those benefits along to Minnesota customers, Marshall Solar plans to start construction of the Marshall Solar Energy Project in spring 2016, with commercial operation occurring prior to the end of 2016. Accordingly, to meet this construction schedule, Marshall Solar respectfully requests that a Site Permit be issued for the Marshall Solar Energy Project no later than January 2016. Depending on when other permits are received, Commission approval in January 2016 will allow Project construction to begin in early spring 2016, as shown in Table 2 below.

Table 2. Project Schedule

Year	Month	Activity
2015	March	Site Permit Application Submitted
	May	Site Permit Public Scoping Meetings & Comment Period
	September	Environmental Assessment Published
	September	Public Hearing
2016	January	Site Permit Issuance
	March	Site Preparation Begins
	April	Construction Begins
	December	In-Service

1.4 Federal, State, and Local Permitting Requirements

The Marshall Solar Energy Project is a "large electric power generating plant" pursuant to Minn. Stat. § 216E.01, Subd. 5 and therefore requires a Site Permit from the Commission under Minn. Stat. § 216E.03. Minn. Stat. § 216E.10 states that a Site Permit from the Commission:

> "...shall be the sole site or route approval required to be obtained by the utility. Such permit shall supersede and preempt all zoning, building, or land use rules, regulations, ordinances promulgated by regional, county, local and special purpose government."

Accordingly, county or township-level zoning is not applicable for this Project. However, as described herein, Marshall Solar has and will continue to work with Lyon County to ensure that the siting of the Marshall Solar Energy Project is compatible with County standards.

In addition to the state Site Permit, Marshall Solar is actively working with appropriate agencies and local governments to ensure that all other permits, approvals, and decisions that may be required for the Project are identified and timely obtained. A list of permits that may be required to construct and operate the Project are outlined below in Table 3.

Table 3. Potential Permits and Approvals

Permit/Approval	Jurisdiction
Federal	
Wetland Delineation	U.S. Army Corps of Engineers ("USACE")
Statement of 'No Permit Required'	
Exempt Wholesale Generator Self Certification	Federal Energy Regulatory Commission
Market-Based Rate Authorization	
State	
Site Permit for Large Energy Facility	Minnesota Public Utilities Commission
Exemption from Certificate of Need ("CON")	
Wetland Conservation Act Approval	Board of Soil and Water Resources ("BWSR")
National Pollutant Discharge Elimination System Permit ("NPDES")	Minnesota Pollution Control Agency ("PCA")
License for Very Small Quantity Generator of Hazardous Waste	
Spill Prevention Control and Countermeasure ("SPCC") Plan	MPCA via U.S. Environmental Protection Agency ("EPA")
Utility Permits on Trunk Highway Right-of-way	MN Department of Transportation ("MnDOT")
Oversize/Overweight Permit for State Highways	
Access Driveway Permits for MnDOT Roads	
Local	
Septic Well Permit	Lyon County
New or Modified Driveway or Entrance Permit	Lyon County Highway Department/Stanley Township
Temporary Road Closure	
Over-width / Overweight Load	
Utility Crossing Permit	

While Minn. Stat. § 216B.243 generally requires a CON to construct a generation facility with a total capacity of 50 MW or more, at its February 12, 2015 agenda meeting the Commission approved the Marshall Solar PPA with NSP in Docket No.: E-002/M-14-162. In doing so, the Commission determined that the Marshall Solar Energy Project was exempt from the CON requirement pursuant to Minn. Stat. § 216B.243 Subd. 9, which exempts solar electric generation facilities from the CON requirement if the Commission determines that the generator would provide a utility with a reasonable and prudent approach for meeting its renewable energy obligations under Minn. Stat. § 216B.1691 after consideration of specific factors. A written order from the Commission is pending.

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2 Project Description and Overview

2.1 Overview

Marshall Solar is currently developing the Marshall Solar Energy Project, a 62.25 MW AC solar PV facility located in Lyon County, Minnesota. The Project's output will be delivered to NSP under a long-term PPA. The Project would interconnect to the regional electrical system at 115 kilovolts ("kV") at the Lyon County Substation, which is located adjacent to the Project Area (Figure 2-1). Marshall Solar selected this location based on a number of factors, but a key consideration in the selection process was the Project's proximity to existing electrical and transportation infrastructure, including the new Brookings County to Twin Cities 345 kV transmission line. Existing infrastructure in the immediate vicinity allows Marshall Solar to minimize the need to construct ancillary facilities beyond the main Project footprint.

2.2 Size and Location

The Project Area encompasses approximately 510 acres of privately owned land in Lyon County, approximately four miles east of the city of Marshall. Major roadways in the area include State Highway 19 and County Highways 9 and 11. The Project Area is bisected by 290th Street and lies between County Highway 9 and 320th Avenue. All Project components would be located within Township 112 North, Range 40 West, Sections 28 and 33 of the 5th Principal Meridian (Figure 2-1).

As discussed in Section 3.1 below, this Application contains a preliminary site layout within a larger "Project Area" that reflects Marshall Solar's effort to maximize the energy production of the Project, follow applicable setbacks, and minimize impacts to the land, environment and surrounding community. The final site layout within the permitted Project Area may, however, differ from the preliminary layout set forth in this Application. While Marshall Solar expects that the final layout will remain substantially similar to the preliminary layout presented in Figure 3-1, changes may occur as a result of ongoing site evaluation, permitting processes, landowner preferences and micro-siting activities. In addition, the final layout may change upon final completion of site control activities. Of course, Marshall Solar will not site facilities on property it has not acquired within the Project Area and will observe any required setbacks from property lines of any non-participating landowners within the permitted Project Area.

Marshall Solar has entered into Purchase Option Agreements with the landowner for each of the parcels on which the Project would be constructed. Marshall Solar would exercise its purchase options and hold title to all the property prior to the start of construction.

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 2.1
Project Overview

Legend

- Project Area
- Township Boundary
- Section Line

Existing Transmission

- 69kV AC
- 115kV AC
- 345kV AC
- Lyon County Substation
- Otter Tail Power Substation

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2.3 Proposed Facilities and Energy Conversion Process

The Project will include the following major components, systems and associated facilities:

- Solar panel arrays, panels, and support structures
- Electrical collection system
- Step-up transformation / Project substation
- 115 kV Generator tie-line and utility interconnection ("gen-tie" line)
- Access roads
- O&M building
- Perimeter fencing

Each of these components is described in more detail in the following sections.

2.4 Alternatives Considered but Rejected

The location of the proposed Project was selected based on a number of factors, including solar resource, environmental factors, site suitability, and proximity to Xcel Energy's existing Lyon County Substation. NextEra submitted three additional project bids to NSP during the RFP process; however, none of the alternative sites were selected for further consideration and were not proposed as alternatives to the Marshall Solar Energy Project. No other alternatives locations for this proposed Project were considered. Different equipment options were considered during the analysis of the Project, specifically whether to design a project using single-axis trackers or a fixed racking system for the solar arrays. In the final analysis at this particular location, Marshall Solar concluded that a fixed racking system was preferable to a single-axis tracker given the expected costs, generation profiles, and maintenance requirements of each technology. In addition fixed system technology allows for the use of the existing terrain minimizing the impact to on-site soils.

2.5 Cost Analysis

The total cost to construct the Project is expected to be in excess of $100 million. The total construction costs include development expenses, land and equipment procurement costs, and all labor and other material costs paid to contractors. Annual operating costs during the life of the Project are expected to average approximately $1 million. Operating costs include labor, materials, management, and all applicable taxes paid to the appropriate jurisdictions. A specific description of the tax benefits to state and county governments is described in greater detail in Section 4.2.5. In orally approving the Marshall Solar PPA with NSP at its February 12, 2015 agenda meeting, the Commission concluded that the Marshall Solar Energy Project was a cost-effective, reasonable, and prudent approach for NSP to meet its renewable energy obligations pursuant to Minn. Stat. § 216B.1691.

2.6 Future Expansion

At this time, there are no plans to expand the proposed Project beyond its current size or scope. The Project PPA specifies the size and expected output of the facility and the interconnection agreement with NSP and MISO will also place technical limits on the facility's size and generating characteristics. Any future expansions would require that NextEra enter into a second PPA or other contract with an interested customer seeking an additional renewable project as well as a separate interconnection agreement. At that point in time, NextEra would be required to initiate an entirely separate effort to identify, develop, and permit a second facility. Additionally, the land currently available under the existing purchase option agreements would preclude a physical expansion of the facility beyond its current scope. In order to expand, NextEra would be required to secure additional land under separate agreements.

3 Engineering and Operational Design

3.1 Design

There are a number of associated facilities[2] that will be constructed to support the operation of the Project and facilitate the delivery of the electricity to NSP and its customers. Marshall Solar seeks permitting approval from the Commission through the Site Permit for the following associated facilities: an electrical collection and communications system, access roads, a Project substation, a short gen-tie line, and an operations and maintenance ("O&M") facility. These associated facilities are described below. As construction approaches, Marshall Solar may also elect to seek permits for certain associated facilities locally through the applicable local government. Preliminary design specifications for the Project can be found in Appendix A. The current version of the preliminary Project layout is depicted in Figure 3-1.

The Applicant will be responsible for all land acquisition and will obtain the necessary easements or purchase agreements from landowners to build the Project facilities within the permitted Project Area. All Project facilities shown in the preliminary site layout were sited on land for which Marshall Solar currently has site control, or anticipates securing site control in the near future. As previously noted, Marshall Solar has negotiated options to purchase the land rights necessary to build the Project once permitted and, after exercising such rights, would hold title to the land and own all of the improvements on the property for the duration of the Project's useful life. The current land interests under option are sufficient to accommodate the proposed facilities and setback requirements, while providing some facility placement flexibility informed by ongoing site evaluation, permitting processes, landowner preferences and micro-siting activities.

3.1.1 Solar Arrays, Panels, and Mounting Structures

A simple diagram of how the sun's energy is converted to electricity is presented in Figure 3-2. The Project will convert sunlight into direct current ("DC") electrical energy within PV modules (also referred to as "panels"). PV modules will be mounted together in arrays. These arrays will be south facing, oriented in east/west rows, and grouped into individual "blocks" with an individual output of approximately 4.0 MW AC.

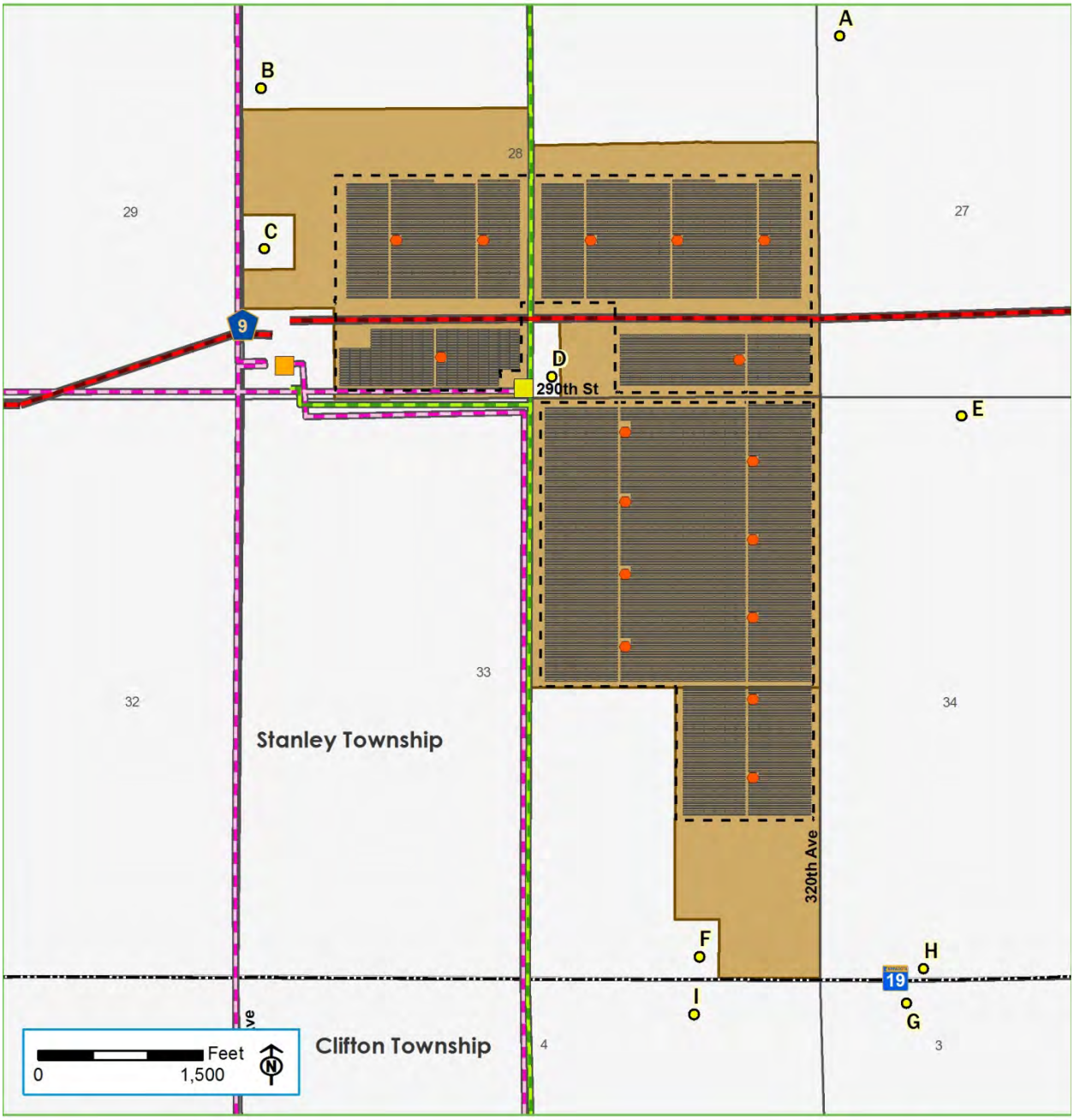
Each block will consist of PV modules configured into arrays and a power conversion station ("PCS") that includes inverters and transformers to convert the DC electricity generated by each individual solar panel into AC electricity for transmission across the Project's electrical grid, and to the on-site substation.

The PV panels will be mounted on a fixed mounting structure, commonly referred to as "racking." Unlike some solar installations, the panel mounting structures are not designed to follow the path of the sun across the sky. Instead, the panels are mounted at a fixed angle and azimuth, which Marshall Solar selected in order to maximize electrical generation while minimizing the costs of the equipment.

[2] Minn. Stat. § 216E.01, Subd. 5 defines a large electric power generating plant as an "electric power generating equipment ***and associated facilities*** designed for or capable of operation at a capacity of 50,000 kilowatts or more." (Emphasis added).

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 3.1
Site Layout



Legend

- Project Area
- **Existing Transmission**
  - 69kV AC
  - 115kV AC
  - 345kV AC
- Lyon County Substation
- Otter Tail Power Substation
- PCS Unit
- Fence
- Array
- Residence
- Township Boundary
- Section Line

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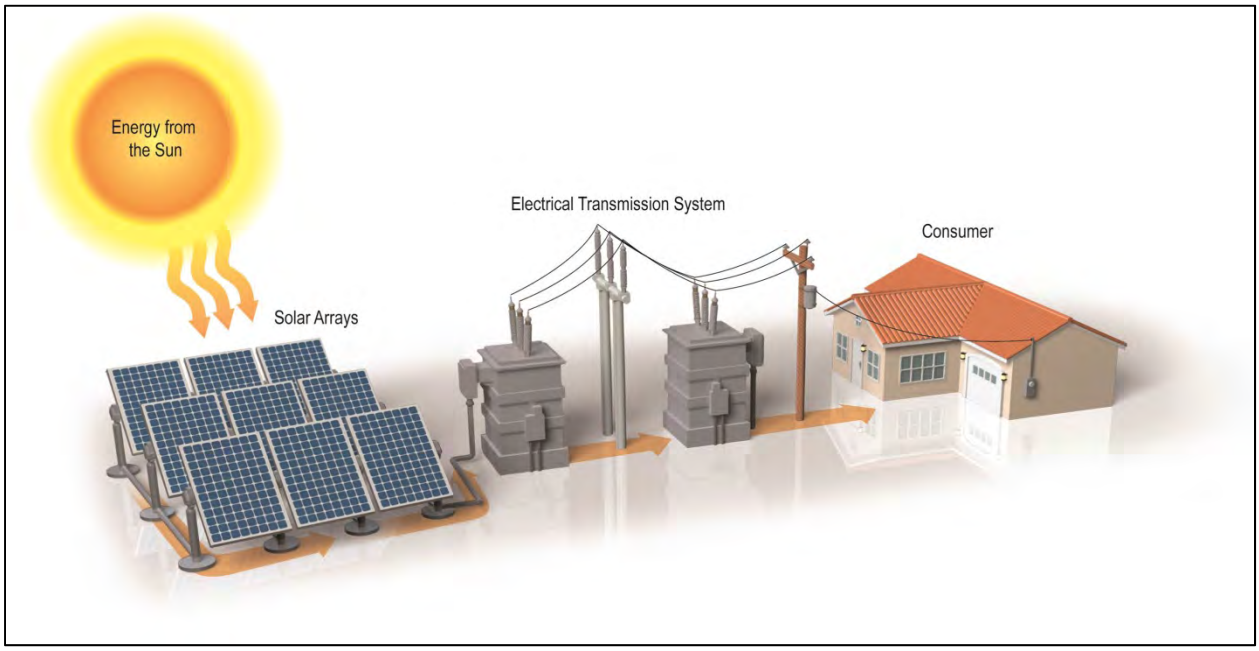
Figure 3-2 How Solar Energy Works



The racking will be supported by steel posts spaced approximately ten to twenty feet apart. Marshall Solar expects that the Project will utilize pile-driven posts inserted into the ground to an approximate depth of six to ten feet below grade; however, depth may vary throughout the site based on soil conditions and further geotechnical analysis. Once mounted on a foundation, the bottom of each solar module array would be approximately one to three feet above grade at a minimum, while the top would be at approximately eight to twelve feet above grade at a maximum, depending on the variation in terrain.

3.1.2 Electrical Collection System

PV modules are electrically connected in series (called a string) by wire harnesses that conduct DC electricity to combiner boxes. Each combiner box will collect power from several strings of modules and feed a PCS via cables placed in covered underground DC trenches. The DC trenches will be approximately three feet deep and one to four feet wide. The bottom of each trench will be lined with clean fill to surround the DC cables and the remainder of the trench will be back-filled with native soil and appropriately compacted.

Each PCS consists of a unit containing several power inverter units which are connected to the adjacent transformers. The PCS units will be approximately eight to ten feet tall and approximately 40 feet long depending on the inverter type; the transformer exterior to the enclosure will be approximately 6.5 feet tall. The PCS units will be placed on concrete pad foundations that will be designed to specifications necessary to meet the local geotechnical conditions. These foundation designs will be finalized as the design advances. The inverters change the DC output from the combiner boxes to AC electricity. The resulting AC current from each individual PCS will then be transformed to the AC collection voltage at the adjacent pad-mounted transformers. These medium-voltage transformers will be placed on a pre-cast concrete pad and the collection circuits will be installed underground. Marshall Solar expects the AC collection voltage to be 34.5 kV.

These medium voltage collection circuits will deliver AC electricity from the PCS units to the Project's on-site substation. Marshall Solar expects nearly all of the AC collection system to be placed underground.

Above ground 34.5 kV AC collector lines may be required to facilitate the crossing of township roads or in certain locations within the Project Area. These locations would be identified as design advances. In the event that an above ground collection line is required, the structures would resemble typical electric distribution lines already located in the vicinity of the Project Area. The poles would be between 30 and 50 feet tall and would be designed and constructed in accordance with all applicable design guidelines.

3.1.3 On-Site Substation/Utility Interconnection

The Project will have an on-site substation that combines all the AC power from the collection circuits. This substation will be located within the Project Area and in proximity to the existing Lyon County substation as depicted in Figure 3-1. The final location and configuration of the on-site substation will be determined as NSP's design of the interconnection progresses.

The on-site substation will occupy approximately one to two acres and will consist of a 34.5 / 115 kV main transformer, one 115 kV and multiple 34.5 kV breakers, motor-operated and manually operated switches, a control enclosure, instrument transformers for metering, and galvanized steel support structures within an eight-foot-tall fence enclosure. The ground coverage will be washed rock. The control enclosure will measure approximately 15 by 45 feet and will house the protection and control equipment, metering equipment, and communication equipment.

After the final voltage step-up, the Project will be interconnected to NSP Lyon County Substation at a voltage of 115 kV. This substation is adjacent to the Project Area, so no off-site transmission lines will need to be constructed in order to connect to the electrical system. Preliminary engineering design and feedback from NSP / MISO indicates that the interconnection to the Lyon County Substation will occur on the east side of the existing facility. Marshall Solar has sited its Project substation as close as possible to this proposed point of interconnection and anticipates that the 115 kV gen-tie from the Project substation to the Lyon County Substation will be less 1,500 feet in length and therefore does not qualify as a "high voltage transmission line" ("HVTL") that would otherwise require a route permit from the Commission (or, alternatively, a local unit of government) under Minnesota Statutes Chapter 216E.[3]

3.1.4 Operation and Maintenance Facility

The Project may include a pre-fabricated metal building to serve the operational needs of the Project. The building would be constructed to meet county building / design standards. The building would be supported on reinforced concrete mat foundations or individual spread footings.

[3] Minn. Stat. § 216E.01, Subd. 4 defines "high-voltage transmission line" as "a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more and is greater than 1,500 feet in length." An HVTL between 100 and 200 kV may be permitted locally pursuant to Minn. Stat. § 216E.05 Subd. 2.

The floor would consist of a reinforced concrete slab corresponding to the dimensions of the building which is expected to be between 2,500 and 5,000 square feet. The O&M building is designed to accommodate various functions required to run the facility including general office space and conference rooms, administrative and engineering functions, equipment and spare parts storage, and other O&M functions. A small parking area large enough to accommodate 3 - 4 vehicles would also be associated with this O&M facility. The parking area would facilitate loading/unloading of parts and equipment, parking for employees, and staging areas for maintenance operations scheduled to take place at the Project.

3.1.5 Automated Facility Control and Monitoring System

The facility control and monitoring system would have two primary components: an on-site SCADA system and the accompanying sensor network. The on-site SCADA system will offer near real-time readings of the monitored devices, as well as control capabilities for the devices where applicable.

NextEra's Fleet Performance Diagnostics Center ("FPDC") located at a secure location at NextEra's Juno Beach, Florida headquarters serves as a twenty-four hour by seven day a week Control and Monitoring Center. This center operates or monitors all of NextEra's generating fleet and is responsible for:

- Resetting of remotely capable Project faults as needed
- Calling out technicians based on projected solar conditions to optimize the delivery capabilities of the Project
- Communication with the local transmission provider and off-taker as required
- Predictive and diagnostic monitoring of Project equipment to optimize delivery capabilities

3.1.6 Transportation/Access Roads

Primary access to the Project Area will be via the existing road network, specifically State Highway 19, County Highway 9, 290th Street, and 320th Avenue. Since these public roadways are adjacent to the Project Area, simple turn-outs or driveways would be constructed to accommodate the entrance of vehicles onto the Project property. These turn-outs would be designed to accommodate all foreseeable vehicle traffic in accordance with local ordinances.

The arrays and PCS units will be accessible via 20-foot wide primary access corridors situated in a north-south direction. These access corridors will consist of unpaved compacted road base and will later be used during operation and maintenance activities.

3.1.7 Pipelines

No pipelines will be built or otherwise impacted as part of the Project.

3.1.8 Permanent Fencing

Permanent security fencing will be installed along the Project perimeter. Fencing will be secured to posts set three to four feet below grade via concrete foundations approximately one foot in diameter. The fencing will consist of chain-link mesh and will extend approximately eight feet above grade, at the request of the Minnesota Department of Natural Resources ("DNR"). Barbed wire will not be used. This fencing will be designed to prevent the general public from gaining access to high-voltage electrical equipment which could cause injury. Additionally, the fencing will prevent larger wildlife from entering the facility.

3.2 Construction

The sections and Table 4 below describe the major activities that will occur during the construction phase of the Project.

Table 4. Construction Activity Timeline

Activity	Timeline (2016)
Site Preparation	March - May
Installation of Posts and Foundations	April - August
Construction of Racks	May - September
Installation of Solar Panels	May - September
Installation of Major Electrical Equipment	July - October
Construction of Plant Substation	April - August
Installation of Wiring and Cable	April - October
Startup and Commissioning	October - December

3.2.1 Site Preparation

3.2.1.1 SURVEYING AND STAKING

Prior to commencing construction, land surveyors will obtain or calculate benchmark data, grades, and alignment from plan information and provide control staking to establish the alignments, benchmarks, and elevations necessary to facilitate construction of the Project. Surveyors will also stake any existing utilities or other areas which will require avoidance by construction personnel and vehicles.

During construction, the surveyor will re-establish and set additional control points as needed. Additionally, areas known or found to have environmentally sensitive resources, if applicable, will be delineated in the field via flagging, roping, staking, fencing, etc. for avoidance during construction as specified in any applicable local permitting requirements or regulations.

3.2.1.2 VEGETATION REMOVAL, GRADING, AND SITE CLEARANCE

Construction areas will be cleared of miscellaneous debris and/or cleared of vegetation that would impede vehicle access in order to prepare the site for safe and efficient installation of Project components. Current vegetation within the Project Area is primarily limited to cultivated crops so vegetation removal requirements are expected to be very minimal. Under the current construction timeline, on-site activities would begin in early spring 2016 prior to the start of planting. Marshall Solar does not expect to impact any crops during the 2016 growing season.

The use of a fixed racking system will allow the existing topography to remain essentially unchanged since the height of the support posts can be adjusted to level the PV modules. Because the site is nearly flat, localized grading would occur only where there are small gullies or sections that otherwise would be impassable by vehicles and also along proposed access or service roads.

Grading for the construction of the Project will consist of cutting, filling, and compaction of earth in isolated areas (e.g., Project substation and PCS units) around the site to meet the final design requirements. Although not expected, if larger areas require grading, a disc and roll technique would be used. The disc and roll technique is based on conventional farming practices using tractors to till the soil, which helps level out low spots, and then drum rollers to compact the soil. This technique would be less impactful than conventional cut and fill grading.

Materials suitable for compaction (including engineered fill) will be brought to the site as needed and off-loaded at the designated road or building location for immediate dispersion. Engineered fill is a material that is placed and compacted in accordance with approved design criteria for a specific piece of equipment or intended purpose. Areas likely to require engineered fill include inverter and substation pad locations, and potentially certain parts of the collecting system trenches. Marshall Solar anticipates that most of the on-site soils, except for organic soils, can be used as site-engineered fill and trench backfill provided the material is free of particles larger than 3 inches in diameter, organic matter, and other deleterious materials.

Materials unsuitable for compaction, such as mowed debris, will be removed and loaded immediately for subsequent disposal at a designated off-site location. Contaminated materials are not expected; however, if any such materials are encountered during excavation, they will be disposed of at the nearest appropriate facility in accordance with applicable laws, ordinances, regulations, and standards.

3.2.2 Solar Equipment Installation

3.2.2.1 SOLAR ARRAY ASSEMBLY AND CONSTRUCTION

During array assembly, multiple crews and various types of vehicles will be working within the Project Area. These vehicles include flatbed trucks for transporting arrays, small all-terrain vehicles, and pick-up trucks used to transport equipment and workers throughout the Project Area.

The racking system supports will be constructed using steel piles driven into the ground. Driven steel pile foundations are typically galvanized and used where high load bearing capacities are required. The pile is driven using a hydraulic ram, which requires two workers. Soil disturbance would be restricted to the hydraulic ram machinery, about the size of a small tractor, temporarily disturbing soil at each pile insertion location. No pre-drilling for post holes is expected at this site.

Solar PV panels would be shipped to the site ready for installation and delivered to a centralized lay-down area. From the lay-down area, palletized boxes of panels would be delivered to crews in the Project Area and those crew members would mount and secure each individual panel to the racks.

Other crews would be engaged in excavating and constructing foundations for the PCS units and pad mount transformers, and installing the PCS equipment using cranes. Electricians and instrumentation installers would then run the electrical cabling throughout the solar field and electrically connect the components.

3.2.2.2 O&M BUILDING

The O&M building will be a pre-engineered metal building with metal siding and roof. The building would be supported on reinforced concrete mat foundations or individual spread footings. The floor will consist of a reinforced concrete slab corresponding to the dimensions of the building. The pre-fabricated steel building structure will then be assembled. Exterior finishes will be installed as the mechanical and electrical systems are being built inside. Interior finishing work will follow and final fixtures and equipment would be installed.

3.2.3 On-Site Substation Construction

The on-site substation will take approximately five months to construct, electrically connect, and test. The on-site substation will consist of a 34.5 / 115 kV step-up transformer, 115 kV SF6 circuit breakers, along with multiple vertical break disconnect switches and rigid bus on post insulators and fittings.

Construction work within the substation site will include site preparation and installation of substructures and electrical equipment. Substation materials and equipment will be delivered to and stored at the substation site. Galvanized steel will support most of the equipment. Installation of concrete foundations and embedments for equipment will require the use of trenching machines, concrete trucks and pumpers, vibrators, forklifts, boom trucks, and large cranes. Above ground and below ground conduits from this equipment will run to a control enclosure that will house the protection, control, and automation relay panels. A station service transformer will be installed for primary AC power requirements. Batteries and battery chargers will be installed inside the enclosure for auxiliary power to the switchyard's control system. Crushed rock will cover the area of the substation and adequate lighting will be installed around the substation for worker safety during construction and operation.

3.2.4 Gen-Tie Line Construction

A short gen-tie line will be constructed entirely within the Project Area for operation at 115 kV, the nominal operating voltage at the proposed point of interconnection at the Lyon County Substation. The structure designs will be engineered to site and load-specific design limits and in accordance with current standards.

Any crossings of existing transmission lines by the Project gen-tie will occur in accordance with the most current revision of the Institute of Electrical and Electronics Engineers National Electric Safety Code ("NESC") and in accordance with any other design requirements requested by the transmission owner / operator.

Marshall Solar is coordinating with NSP on the final location of the both the Project substation and the specific point of interconnection within the Lyon County Substation. The final location of both points will dictate the ultimate routing and configuration of the gen-tie line. In all cases, the gen-tie line will be installed on a set of self-supported monopole and/or H-frame structures.

The gen-tie poles will be 60 to 100 feet tall; the type of poles and span length will vary depending on the final line configuration.

Porcelain insulators and shield wires will be installed to protect personnel and equipment from lightning strikes and other hazards. All of the structures would be installed within the Project Area.

3.2.4.1 POLE SITE WORK AND INSTALLATION

At each site, a work area will be required for the structure footing location, structure assembly, and necessary crane maneuvers. Each work area (one per structure) will be approximately 50 feet by 50 feet. Each area will be cleared of vegetation and graded only to the extent necessary to facilitate the safe operation of heavy construction vehicles and equipment.

Installation of new structures to support the 115 kV circuit will begin with the excavation of foundations by a vehicle-mounted power auger or backhoe. Once the foundation holes are cleaned, structures with preassembled insulators, hardware, and stringing sheaves will be lifted into position, inserted into the foundation holes, and gravel or concrete will be poured to backfill the hole and create a foundation. Any native soil not used to backfill will be spread around the pole. Erecting each structure will take approximately six to eight hours.

3.2.4.2 CONDUCTOR STRINGING

Conductor stringing for the 115 kV gen-tie line will consist of the installation of the circuits and ground wires originating from the step-up transformer and terminating at the Lyon County Substation.

Pilot lines will be pulled from structure to structure and threaded through the stringing sheaves at each structure. The conductors then will be pulled back through the stringing wheels using a machine located on the ground.

This process will be repeated until all of the conductors are pulled through all sheaves. The shield wire and conductors will be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end. Tensioners and/or pullers, line trucks, wire trailers, and tractors needed for stringing and anchoring ground wires or conductors will be necessary at each pulling site.

3.2.5 Telecommunications Line Installation / Other Infrastructure

Two independent and redundant telecommunication lines will be installed, as required for connection and interaction with the electrical grid. The primary telecommunication line will be strung at the top of the gen-tie structures and would run to the Project substation. Depending on the final location of the O&M building, a second telecommunications line may be required. Marshall Solar expects that existing telecommunications infrastructure is available at the Lyon County Substation or along County Highway 9 to the west of the Project Area. Marshall Solar intends to coordinate with the applicable utility owners to arrange for access to the existing telecommunications infrastructure

Similarly, Marshall Solar intends to secure electrical service for the O&M building from the low voltage electrical distribution lines running along County Highway 9. In both cases, Marshall Solar will secure any easements or other approvals necessary to connect the Project facilities.

3.3 Construction Equipment and Work Force

3.3.1 Construction Equipment

Varying pieces of equipment will be used at different times during the construction process. The construction equipment will include:

- Flat-bed trucks
- Concrete trucks and pumpers
- All-terrain vehicles
- Pick-up trucks
- Hydraulic ram
- Cranes
- Trenching machines
- Vibrators
- Forklifts
- Boom trucks
- Vehicle-mounted power auger or backhoe
- Disking machines
- Rollers
- Tensioners and/or pullers
- Line trucks
- Wire trailers
- Tractors

3.3.2 Construction Work Force

The total number of construction workers (consisting of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel) will be approximately 225 workers on average for the duration of Project construction. When construction reaches its peak or during certain portions of the schedule when manpower-intensive tasks take place, Marshall Solar expects a peak of approximately 275 workers on site. Construction will occur over an approximate nine month timeframe. An overview of construction efforts and timelines are listed in Table 4.

3.3.3 Construction Hours

Construction generally will occur between six a.m. and seven p.m., Monday through Saturday. Work outside that period may be necessary to make up schedule deficiencies or to complete critical construction activities. Equipment and system testing, commissioning, and other similar activities could occur 24 hours per day, seven days per week. Depending on the scheduled activities and availability of workforce, these construction periods may vary.

3.3.4 Construction Traffic

As the site work progresses, construction equipment and materials will be delivered by truck and will be staged in the order of installation. Delivery of construction equipment and Project components will be coordinated with local agencies to ensure compliance with all applicable Minnesota Department of Transportation ("MnDOT"), county, and local requirements. Weight and height restrictions will be verified and any required permits would be obtained by the delivery service. Only the main transformer is expected to require heavy haul (oversize) transport and transportation permits. Transportation of any hazardous materials to the solar plant site would comply with all U.S. Department of Transportation, U.S. Environmental Protection Agency ("EPA"), PCA, and all other regulations.

3.4 Maintenance Activities

Various maintenance activities are described in the sections below and outlined in Table 5.

3.4.1 Annual Facilities Operations Plan

The facility will be operated in accordance with proven practices utilized by Marshall Solar's parent company, NextEra throughout its PV portfolio and across other generating technologies. The following services and maintenance activities will take place in conformity with an Annual Facility Operating Plan:

- Perform all scheduled and unscheduled service and required preventative maintenance of all equipment including; PV modules, inverters, controllers, control panels, connections to SCADA system sensors, DC electrical collection system, including the controls, and instruments and resetting of inverters, according to PV module and inverter O&M Manual. Also provide scheduled and unscheduled services to the electrical system from the inverters to the substation including the pad mount transformers and collection system.
- Coordinate all warranty work with PV equipment and inverter supplier during the warranty period.
- Employ, hire, train, direct and discharge, per agreed upon guidelines, all employees any contractor hired to support service and maintenance of the on-site equipment.
- Provide qualified supervision of service and maintenance employees.
- Provide any and all technical support required for service and maintenance. Develop, maintain, and implement safety programs for the employees.
- Provide all regulatory required training including, but not limited to hazardous materials and occupational safety and health.
- Provide all materials, tools, supplies, consumables, equipment, vehicles, maintenance equipment, safety equipment, operating equipment, clothing and other supplies, personal property, and assets necessary to conduct scheduled and unscheduled service and preventative maintenance of the equipment per manufacturer's specifications.
- Provide 24-hour remote monitoring and diagnostic analysis of PV site conditions from the FPDC located at NextEra's corporate headquarters.
- Provide regular and ongoing reports concerning the service and maintenance of the Project.

- Develop, implement, and update an Annual Service and Maintenance Plan that delineates major and minor services to be performed each month.
- Respond to emergencies, nonscheduled shutdowns, and outages in an appropriate manner - if weather and site conditions permit - to attempt to minimize loss of facility revenue, damage to the equipment, or bodily harm to personnel.
- Provide reset and emergency response call-out capability, if weather and site conditions permit.
- Provide timely telephonic, electronic, and written notice, if required, in the event of any facility malfunction or unusual event at or involving the equipment.
- Monitor component failures and perform root cause analysis in a reasonable time frame:
    - Develop and maintain a database of component failures
    - Perform root cause analysis to identify failure modes
    - Develop and maintain predictive models to forecast future failures
    - Identify counter-measures to mitigate failures and implement those counter-measures determined to be cost effective throughout the equipment
- Maintain the facility in compliance with all applicable federal, state, and local laws/ordinances and regulations, including but not limited to safety, industrial hygiene, and environmental conditions on, under, or about the facility (air, soil, and ground water conditions), endangered species, and hazardous materials.
- Comply with site mandated safety and environmental standards.
- Conduct preventive maintenance inspections of facility equipment. Visual, electrical, and mechanical inspections will include but not be limited to the following detailed activities:
    - Inspect torque of electrical and mechanical connections
    - Inspect condition of finish or corrosion protection
    - Inspect integrity of module mechanical and electrical connections (random)
    - Inspect for discoloration or damage to modules
    - Inspect damage to support structures
    - Verify integrity of installation and support of electrical cable and conduit systems
    - Verify integrity and completeness of the wiring
    - Identify conditions of accelerated corrosion
    - Identify any distortion or other structural damage resulting from excessive wind, rain, or snow, if applicable
    - Identify excessive misalignment or shifting of modules and system components.
    - Check for evidence of wildlife (birds, rodents, bugs, nesting or soiling)
    - Check for module misalignment > 1.5 cm. – Torque and realign per specifications
    - Check for broken module glass
    - Identify any bulging or distorted module junction boxes
    - Identify any discolored wiring, signs of arcing or overheating
    - Check inverter filters and heat sinks for accumulation of debris or dust
    - Check for and remove any plant material that may come in contact with components
    - Daily inspections consisting of checks on modules, electrical connections, combiner boxes, inverters, and switchyard equipment

3.4.2 Panel Washing

Currently, Marshall Solar is evaluating the frequency of panel washing required at this Project site. Given the levels of precipitation in the area, both during the summer and winter, panel washing may not be required on a regular basis. This analysis will continue and if Marshall Solar determines that washing is required, it would be conducted by contractors under Marshall Solar staff supervision and utilize water from commercially available sources.

3.4.3 Road Maintenance

Paved Project roads will be maintained to preserve the asphalt surface from degradation. Marshall Solar may apply a sealant as necessary in order to prevent decay. Oxidation and potholes or other damage will be repaired as soon as practical. Paved roads are only expected to include the main access road from County Highway 9 to the Project substation and O&M building area.

Unpaved roads would be maintained regularly to control the flow of water on and around the road, remove obstacles, and maintain a solid surface. Maintenance would be completed by conducting regular surveys to inspect the conditions of the road surfaces and blading, grading, or compacting the road surfaces to preserve a minimally sloped and smooth planed surface.

3.4.4 Project Substation

During operations, the Project substation would be unmanned. All substation monitoring and control functions would be performed remotely. Unauthorized entry into the substation would be prevented by fencing and locked gates. Warning signs would be posted and entry would be restricted to Marshall Solar authorized personnel.

Routine operation would require a single pickup truck visiting the substation for switching, as well as larger maintenance trucks visiting the substation for equipment maintenance. Maintenance activities would include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. Routine maintenance is expected to require approximately three trips per year by a two- to four-person crew. Typically, a major maintenance inspection would take place annually, requiring approximately four personnel for approximately one week.

A schedule which outlines the various preventative maintenance activities that will generally occur each month during a typical calendar year is included in Table 5.

Table 5. Project Maintenance Schedule

Service Description	Frequency
Solar Field	
Met Station	
Clean Sensors	once per week
Check Filters	once per month
Level All Sensors	once per month
Sensor Calibrations	once every 24 months
Reference Module Cleaning	once per week
Reference Module Calibration	once every 12 months

Service Description	Frequency
Panels	
Module Inspection	once per week
Module Cleaning	At 3% Soiling Derate (per Reference Modules)
Themography (IR) Scan	once every 12 months
Inverters	
Inspection	once per week
Cleaning	once every 12 months
HVAC Inspection	once per week
HVAC Maintenance	once every 12 months
Pad-Mounted Transformers	
Inspection	once per week
IR Scan	once every three months
Oil Sample	once every 12 months
Control Room/Switchyard	
Control Room	
Inspection	once per week
Battery Cell Test	once every three months
HVAC Inspection	once per week
HVAC Maintenance	once every 12 months
Switchyard	
Inspection	once per week
Switchyard IR Scan	once every six months
Breaker Maintenance	once every 24 months
Transformer Oil Sample	once every 12 months
Revenue Meter "A" Phase Calibration	once every 12 months
Revenue Meter "B" Phase Calibration	once every 12 months
Revenue Meter "C" Phase Calibration	once every 12 months
Safety	
Site Safety Audit	once per month
Site Safety Assessment	once every 12 months
First Aid Kit Quantity Inspection	once per month
Fire Extinguisher Inspection	once per month
Fire Extinguisher Recertification	once every 12 months
Protective Grounds Recertification	once every 12 months
Voltage Rated Glove Recertification	once every six months
Switch Stick Recertification	once every 24 months
Administrative	
Spare Parts Inventory	Partial count once every three months

Service Description	Frequency
Spare Parts Inventory	Full county once every 12 months
SCADA Inspection	daily
SCADA Maintenance	once per month
PI/Historian Inspection	daily
PI/Historian Maintenance	once per month

3.5 Decommissioning & Reclamation

The Project will operate under a PPA for a 25-year term. However, the useful life of the Project may extend an additional 10-year period. At the end of the Project's useful life, Marshall Solar and its parent company will assess whether to cease operations at the Project site or to replace equipment and attempt to enter into a new PPA or other arrangement. If NSP or another entity is willing to enter into such an agreement, the Project could continue operating. If no commercial agreement is possible, then the facilities would be decommissioned and dismantled and the site restored. In general, the majority of decommissioned equipment and materials will be recycled. Materials that cannot be recycled will be disposed of at approved facilities.

General decommissioning and reclamation activities by Project component are described below. Marshall Solar will submit a detailed decommissioning and site restoration plan in the event that such a plan is required. In addition, if any type of decommissioning financial security is required, Marshall Solar can provide security in the form of one of the following:

- Surety bonds from a reputable provider payable to the applicable local agency
- Irrevocable letters of credit payable to applicable local agency issued by financial institutions that have the authority to issue letters of credit and whose operations are regulated and examined by a federal agency

If required, the decommissioning security can be provided before construction and will be structured so the funds will be returned to Marshall Solar upon completion of the decommissioning and restoration activities.

The security may also be structured in a manner such that the local agency may access funds to pay for the decommissioning and restoration of the site in the event that Marshall Solar becomes insolvent, or the duration of a temporary closure continues long enough that the closure is considered permanent. The security costs are generally required to match the estimated cost of the closure, decommissioning, and reclamation.

3.5.1 Solar Plant Facilities

At the end of the Project's useful life, the Project would cease operation. At that time, the facilities would be decommissioned and dismantled and the site restored. Decommissioning activities will require a workforce of approximately 30 workers, and would take approximately four months to complete. In general, activities would include:

1. Dismantling and removal of all above ground equipment (solar panels, racking, transformers, Project Substation, O&M building, etc.)
2. Excavation and removal of all below ground cabling
3. Removal of posts
4. Break-up and removal of concrete pads and foundations
5. Pumping and break-up of any septic tank (backfilled with clean soil) and abandonment of leach field (if applicable)
6. Abandonment of underground utilities
7. Scarification of compacted areas within and contiguous to the solar plant facility (including but not limited to internal and external access roadways)

3.5.2 Gen-Tie Line, Telecommunication Lines, and Substation

Dismantling would proceed according to four general stages: 1) dismantling and demolishing above ground structures, 2) removal of concrete foundations, 3) excavation and removal of soils and broken concrete from the site, and 4) surface contouring to return the disturbed areas to near-original conditions.

4 Environmental Information

4.1 Environmental Setting

The Project Area is located approximately four miles east of the city of Marshall in Lyon County, Minnesota. This region of Minnesota is largely used for agricultural purposes with corn and soybeans being the two major cultivated crops grown across the landscape.

The Project Area is located in a region classified as the Minnesota River Prairie Subsection as defined by the DNR and U.S. Forest Service's ("USFS") Ecological Classification System ("ECS") (2014). The Minnesota River Prairie Subsection is described as having relatively flat topography with 15 feet or less of local relief. This area is drained by the Minnesota River (approximately 20 miles northeast of the Project Area) and most wetlands were drained for agriculture. Historically, this subsection was dominated by tallgrass prairie and maple, elm, and cottonwood forests. Currently, the region is dominated by cultivated crops with very few, if any, remnant prairie stands remaining.

4.2 Human Settlement

4.2.1 Public Health and Safety

This section describes public health and safety as it relates to the construction, operation, and maintenance of the Project.

4.2.1.1 EXISTING CONDITIONS

The Project Area is located in a rural agricultural setting with low population density. The Project Area is currently being used for cultivated crops. The closest airport is the Southwest Minnesota Regional Airport or Marshall/Ryan Field, located approximately seven miles west of the Project Area. The airport is owned by the city of Marshall. It has a 7,200-foot, paved runway to accommodate an average of 63 corporate / commercial flights per day. Twenty-four aircraft are based out of the airport, 63% of which are single engine aircraft.

The Lyon County Substation and a smaller Ottertail Power Company ("OTP") Substation are located adjacent to the Project Area. Numerous electric transmission and distribution lines connect into these substations, some of which traverse the Project Area (Figure 2-1). Current health and safety concerns would pertain to existing agricultural practices and existing transmission infrastructure.

Each of these existing electrical facilities (i.e., transmission lines and substations) is characterized by the presence of electromagnetic fields. Electromagnetic Fields ("EMF"); also called electric and magnetic fields are invisible lines of force that a person cannot feel that surround electrical devices and wiring. Electric and magnetic fields can occur together or separately and are a function of voltage and current. Electric fields come from electric pressure (for example, when something is plugged into an outlet but not turned on) and are commonly represented in units of volts per meter ("V/m"). Magnetic fields come from the movement of electric charges (when something is plugged into an outlet and turned on) and are represented by two common units: microtesla ("μT") and milligauss ("mG").

Two types of EMF are associated with the Project: static EMF and ELF (or power frequency EMF). Static EMF comes from the DC PV cells. ELF is associated with AC energy and is produced from the inverters and transmission lines. Levels of EMF drop off rapidly with distance from the source.

The internationally accepted guideline for the general public exposed to static EMF is 4 million mG; for ELF EMF it is 2,000 mG. For people with medical devices including cardiac pacemakers and implantable defibrillators, the acceptable level is 1,000mG. People who are concerned about EMFs possible effects on pacemakers, implantable defibrillators or other implanted electronic medical devices should consult their medical doctors and the manufacturer of their device.

4.2.1.2 IMPACTS

Impacts to the Southwest Minnesota Regional Airport are not expected. The Federal Aviation Administration's ("FAA") Notice Criteria Tool was used to determine if coordination or notice to the FAA is required. The Notice Criteria Tool uses land elevation and structure height to determine if hazards to an airport exist. Using the highest land elevation within the Project Area (1,120 feet) and the tallest possible structure height (100 feet for the gen-tie line) it was determined that Project infrastructure does not exceed the Notice Criteria. Glare from the solar facility will be minimal. The individual solar panels that make up the solar arrays are designed to absorb as much sunlight as possible and are constructed with a non-reflective glass. One additional point to consider is that numerous airports or airfields, including facilities operated by the Department of Defense, have added or are considering the addition of solar PV facilities near operating airfields (FAA 2010). This fact demonstrates that properly sited PV facilities are not likely to adversely impact flight operations.

Impacts to public health from a solar facility are minimal. On a daily basis, people around the world are exposed to extremely low frequency ("ELF") EMF as a result of using electricity in their homes, schools and offices. EMF exists around all common household electronic devices (e.g., refrigerator, stove, alarm clock, lamps, household wiring).

Levels of EMF from the Project will be considerably below acceptable guidelines. Electrical collections within the solar field will be 2 – 3 feet below ground and EMF dissipates quickly with buried equipment. As stated above, the only potential for exposure would come from inverters and transmission lines. EMF from the existing transmission lines crossing and adjacent to the Project Area exponentially decreases with distance from the line (NIEHS 2002). For inverters, EMF will dissipate quickly and will be at background levels at the Project site layout fence line. The nearest home is approximately 230 feet from the site layout fence.

Stray voltage is often a concern in agricultural areas. Stray voltage is caused by improper grounding or shorts in wiring that results in an absolute potential being imparted into the ground or structure. All electrical components in the solar field, including inverters and transformers will be grounded in accordance will applicable electrical code and industry standards. Site soil resistivity measurements are taken as part of the site geotechnical analysis and that data is used to design grounding systems. The potential for stray voltage is negligible and should a fault occur later during operations it would be quickly identified by plant monitoring systems and corrected.

4.2.1.3 MITIGATION

Impacts to human health and safety are not expected and no mitigation is proposed. Construction sites – especially those that involve high-voltage equipment – are inherently dangerous. Marshall Solar will conduct worker safety and awareness training prior to construction, hold daily safety briefings, and will adhere to contractor and industry safety standards during the construction and maintenance of the Project. Risks associated with EMF are expected to be negligible. The Project will adhere to all state and local setback standards and NESC guidelines. Appropriate signage and lighting (where necessary) will be used at entryways and at the O&M building.

Coordination with local fire and emergency medical service providers will occur to designate 9-1-1 addresses for the Project and identify emergency protocols. The entire Project will have an eight foot, chain-link fence to limit access by the public. No additional mitigation is proposed.

4.2.2 Displacement

This section describes the locations and potential impacts to homes and structures within or near the Project Area. Data collected by Marshall Solar was used to determine the existing conditions of the Project Area.

4.2.2.1 EXISTING CONDITIONS

Four homes / farmsteads and two substations are located adjacent to the Project Area; however, no homes or structures are located within the Project Area (Figure 4-1). Table 6 describes the distances of Project infrastructure to nearby residences.

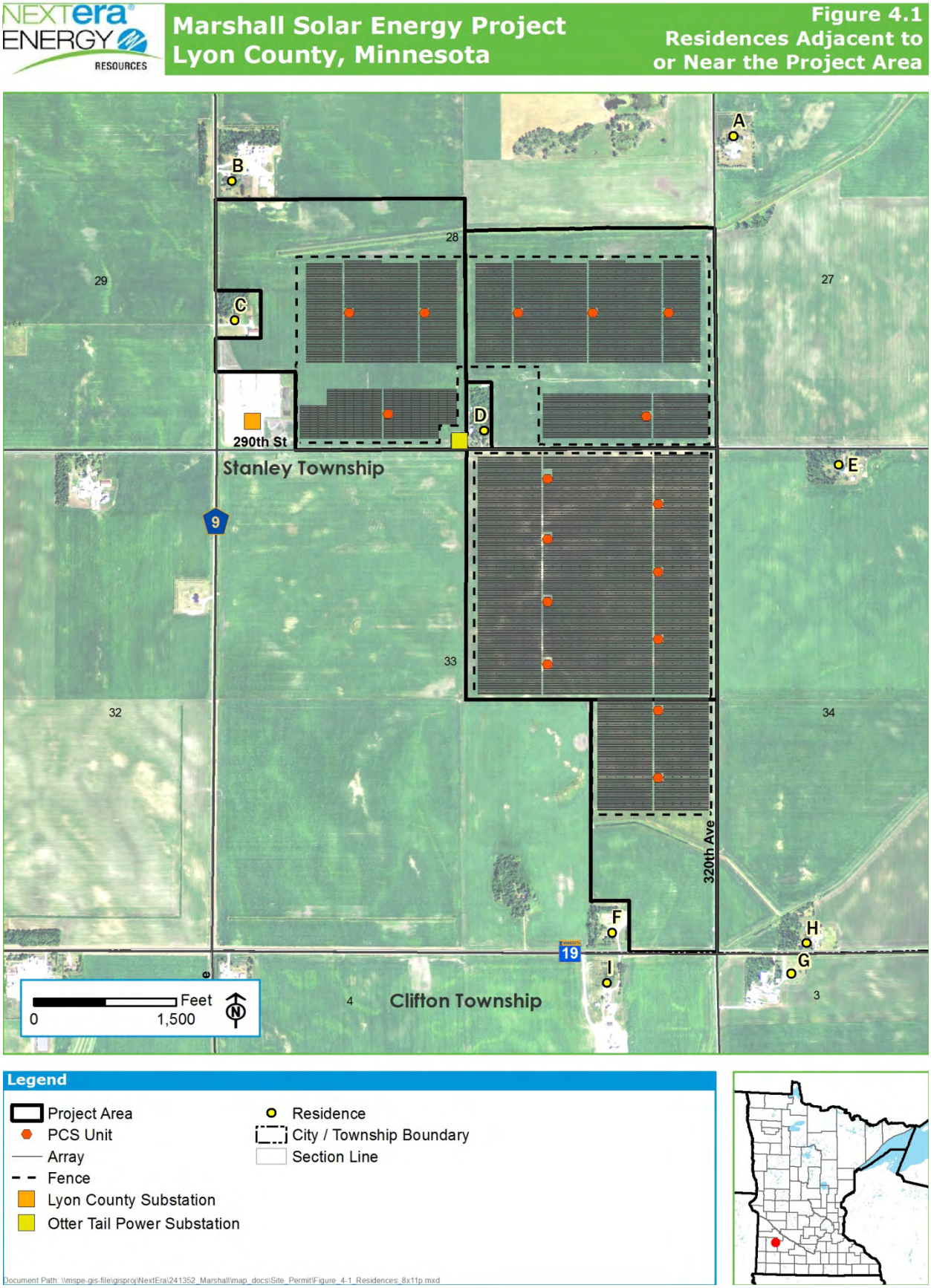
Table 6. Distance of Project Infrastructure to Adjacent Residences

Residence ID	Distance to Fence (ft)	Distance to Array (ft)	Distance to Nearest PCS Unit (ft)
A	1,298	1,366	1,969
B*	1,049	1,170	1,843
C*	652	754	1,202
D*	233	280	828
E	1,348	1,376	1,930
F*	1,244	1,294	1,682
G	1,875	1,931	2,466
H	1,689	1,745	2,315
I	1,771	1,821	2,204

*Homes immediately adjacent to the Project Area.

4.2.2.2 IMPACTS

It will not be necessary for homes / farmsteads to be displaced during the construction and operation of the Project. The Project will not result in the release of hazardous materials into the environment which could be of concern to adjacent residents. Additionally, Project components are generally very quiet when operating and will not result in noise levels above background at nearby residences. The only impact to nearby residences would be visual in nature. Visual impacts are subjective, and may or may not bother those living adjacent to the Project.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Marshall Solar Energy Project
Lyon County, Minnesota
Figure 4.1
Residences Adjacent to
or Near the Project Area
A
B
C
D
E
F
G
H
I
28
29
27
290th St
Stanley Township
9
33
32
34
320th Ave
19
4
Clifton Township
3
Feet
0
1,500
N
Legend
Project Area
PCS Unit
Array
Fence
Lyon County Substation
Otter Tail Power Substation
Residence
City / Township Boundary
Section Line
Document Path: \\mspe-gis-file\gisproj\NextEra\241352_Marshall\map_docs\Site_Permit\Figure_4-1_Residences_8x11p.mxd

4.2.2.3 MITIGATION

Although impacts due to displacement are not expected, the Project has taken into consideration the proximity of the adjacent homes / farmsteads and will attempt to design the Project to allow for open space between the residences and the solar facility to the extent feasible. Vegetative buffers may also be considered at the landowner's request. Additionally, Marshall Solar is considering the potential to allow farming within the open spaces between the site layout and the Project Area boundary.

4.2.3 Noise

This section describes potential noise from the Project and any impacts noise will have to adjacent landowners. Data from the Minnesota Pollution Control Agency ("PCA") and the Federal Highway Administration were used to determine existing conditions and standard noise levels.

Sound is made up of tiny fluctuations in air pressure. Sound is characterized by its amplitude (how loud it is), frequency (or pitch), and duration. Sound, within the range of human hearing, can vary in amplitude by over one million units. Therefore, a logarithmic scale, known as the decibel ("dB") scale, is used to quantify sound intensity and to compress the scale to a more manageable range. Noise is simply defined as unwanted sound; the terms noise and sound are often used interchangeably.

The human ear does not hear all frequencies equally. In fact, the human hearing organs of the inner ear deemphasize very low and very high frequencies. The most common weighting scale used to reflect this selective sensitivity of human hearing is the A-weighted sound level ("dBA"). Table 7 shows A-weighted noise levels associated with common, everyday sources.

Table 7. Common Noise Sources and Levels

Noise Source	Sound Pressure Level (dBA)
Jet Engine (at 25 meters)	140
Jet Aircraft (at 100 meters)	130
Rock and Roll Concert	120
Pneumatic Chipper	110
Jointer/Planer	100
Chainsaw	90
Heavy Truck Traffic	80
Business Office	70
Conversational Speech	60
Library	50
Bedroom	40
Secluded Woods	30
Whisper	20

Source: PCA 2008.

Because of the logarithmic scale, sound levels cannot be simply added or subtracted. If sound energy is doubled, the sound level only increases by three dBA. However, a doubling of sound energy is not perceived by humans as a doubling of loudness.

A 3-dBA change is considered a just noticeable difference, a 5-dBA change is considered a noticeable difference, and a 10-dBA change is considered a doubling or halving of loudness.

In Minnesota, statistical descriptors (L_{10} and L_{50}) are used to evaluate noise levels and identify noise impacts. The PCA noise standards are expressed as the maximum permissible noise levels within a one hour period during the daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM).

The L_{10} is defined as the noise level that is exceeded 10 percent of the time, or for six minutes in an hour. The L_{50} is defined as the noise level exceeded 50 percent of the time, or for 30 minutes in an hour.

The PCA categorizes receiving land uses into Noise Area Classifications ("NAC"), which determine the appropriate noise limits. Residential areas, churches, and similar type land use activities are included in NAC-1; commercial-type land use activities are included in NAC-2; and industrial-type land use activities are included in NAC-3. Table 8 identifies the established daytime and nighttime noise standards by NAC.

Table 8. Noise Standards by Noise Area Classification (dBA)

NAC	Daytime		Nighttime	
	L50	L10	L50	L10
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

The primary noise-sensitive receptors near the Project Area are residences (Figure 4-1), where the NAC-1 limits would apply.

The Lyon County Zoning Ordinance performance standards generally prohibit objectionable noise, but they do not contain specific noise level limits. The performance standards also prohibit perceptible vibration beyond the Project Area boundary; however, construction activities are exempt.

4.2.3.1 EXISTING CONDITIONS

The Project Area is in a rural area where existing noise conditions are generally dominated by local vehicle traffic, agricultural activities, and environmental noise sources (for example, wind rustling vegetation). Existing noise conditions in the Project Area are influenced by traffic noise from State Highway 19, County Highway 9, 290th Street, and 320th Avenue. Rural areas have lower population densities than urban or suburban areas, so they tend to be quieter environments. According to ANSI/ASA S12.9-2013/Part 3, rural residential areas have a typical daytime noise level of 40 dBA and a typical nighttime noise level of 34 dBA. Because existing conditions are quieter, rural areas can be more sensitive to new noise sources.

4.2.3.2 PROJECTED CONDITIONS

The proposed Project would include temporary noise from construction and long-term noise from facility operations. Four residential homesteads are adjacent to the Project Area boundary. The four homes themselves range from approximately 230 feet to 1,240 feet from the proposed site layout fence line (Table 6, Figure 4-1). The site layout as it relates to the Project Area boundary is discussed in Section 2.2).

Project construction would involve site preparation, solar equipment installation, on-site substation construction, generator tie-line construction, and telecommunications line installation. Construction would be limited to the Project Area, and would generally occur Monday through Saturday between 6:00 AM and 7:00 PM.

However, work could occur outside of these hours due to schedule deficiencies, critical construction activities, and systems testing and commissioning. Given the limits on noise levels occurring prior to 7:00 AM described above, Marshall Solar and its contractors will be required to plan early morning activities to avoid any exceedances of the existing state noise level guidelines described in this section.

Not all construction activities would necessarily require the use of heavy machinery that could potentially exceed noise thresholds. Activities such as panel mounting, wiring, or various testing functions could be performed during noise sensitive time-frames.

Table 9 contains construction equipment noise levels for various phases of construction activities. For the purposes of calculating potential construction noise levels, the mean hourly noise level - the $L_{eq(1h)}$ - is assumed to be approximately equivalent to the median hourly noise level L_{50}.

Table 9. Construction Equipment Noise Levels

Construction Equipment	Usage %	L_{max} at 50 ft, dBA	$L_{eq(1h)}$, dBA		L_{10}, dBA	
			500 ft	1000 ft	500 ft	1000 ft
Site Preparation						
Tractor	40	84	60	54	63	57
Roller	20	85	58	52	61	55
Combined Noise Levels			62	56	65	59
Solar Equipment Installation – Arrays						
Flat-bed truck	40	84	60	54	63	57
Pick-up truck	40	55	31	25	34	28
Hydraulic ram	10	90	60	54	63	57
Combined Noise Levels			63	57	66	60
Solar Equipment Installation – PCS and O&M Building						
Concrete mixer truck	40	85	61	55	64	58
Concrete pump truck	20	82	55	49	58	52
Crane	16	85	57	51	60	54
Combined Noise Levels			63	57	66	60
On-Site Substation Construction						
Trenching machine	50	82	59	53	62	56

Construction Equipment	Usage %	L_{max} at 50 ft, dBA	$L_{eq(1h)}$, dBA		L_{10}, dBA	
			500 ft	1000 ft	500 ft	1000 ft
Concrete mixer truck	40	85	61	55	64	58
Concrete pump truck	20	82	55	49	58	52
Vibrator	50	85	62	56	65	59
Forklift	50	85	62	56	65	59
Boom truck	40	84	60	54	63	57
Crane	16	85	57	51	60	54
Combined Noise Levels			68	62	71	65

Source: FHWA 2006.

The combined noise levels in the above table account for the types of construction equipment expected for each phase and typical usage factors. A quantity of one was used for each type of construction equipment, so noise levels could be higher if multiple pieces of the same type of construction equipment are used simultaneously. At 1,000 feet construction noise levels could exceed the NAC-1 nighttime L_{10} and L_{50} limits (construction is expected to begin at 6:00 AM, which is considered a nighttime hour). At 500 feet construction noise levels could exceed the NAC-1 daytime L_{10} and L_{50} limits.

The closest residence (Home D in Figure 4-1) is located approximately 230 feet from the site layout fence line. The type and quantity of construction equipment operating at any given time will vary and construction activity will move across the Project Area throughout construction. While contributions from multiple pieces of construction equipment can increase noise levels, construction activities tend to be spread out over larger areas. Construction noise impacts are expected to occur, but Project construction will be temporary.

Operations of the proposed Project would include constant daytime noise from inverters, transformers, and the substation. Facility equipment will not be at full load or will be non-operational during non-daylight hours, so nighttime noise levels will be lower. GE 1500V 4MVA solar inverters and 4MVA transformers are proposed for the Project. At full load, these units produce a combined noise level of 62 dBA at three feet.

Because the units will produce noise constantly, the L_{10} and L_{50} would approximately equal the reference noise level of 62 dBA at three feet. The nearest home to these noise sources is 828 feet from the Block 8 inverter and transformer. Conservatively assuming free field conditions (no obstructions or ground effects) the combined noise level from a single inverter and single transformer at 828 feet is approximately 13 dBA. While there will be contributions from other inverters and transformers at the nearest home, noise levels would be below the MPCA noise limits for NAC-1. Operations of the proposed Project are therefore not expected to cause noise impacts.

Vibration impacts are not expected from Project operations.

4.2.3.3 MITIGATION

Construction-related noise impacts shall be mitigated to meet the MPCA noise limits. Project construction shall use the quietest available construction methods and ensure all equipment is properly maintained and equipped with manufacturer's standard noise control devices. It is recommended to limit construction activity utilizing heavy equipment to the hours from 7:00 AM to 10:00 PM to alleviate nighttime noise impacts. Noise reduction goals shall be determined as the Project construction plan is refined. Construction delivery, staging, and crew parking areas shall be located as far from residences as possible. Expected construction schedules shall be communicated to all nearby residents, particularly for activities that will occur near a home.

Operational noise or vibration impacts are not expected; mitigation measures are not proposed.

4.2.4 Aesthetics

This section describes the aesthetics of Project Area and the potential impacts of the Project on aesthetics. Data from MnDOT, DNR Recreation Compass, National Register of Historic Places ("NRHP") and infrastructure information was used to determine the existing conditions of the Project Area.

4.2.4.1 EXISTING CONDITIONS

Landscape

The landscape surrounding the Project Area is mostly agriculture (primarily cultivated crops), farmsteads, and small woodlots associated with homes / farmsteads. The terrain is generally flat with slight undulations. The topography of the Project Area ranges from 1,090 to 1,120 feet above mean sea level.

Human Settlement

The Project is located in a sparsely populated area where there are only a few homes / farmsteads per square mile. The city of Marshall, located approximately four miles west of the Project Area, is the most heavily populated area in the region. There are four homes / farmsteads located adjacent to the Project Area and five additional homes / farmsteads within ½ -mile (Figure 4-1).

NSP's newly upgraded Lyon County Substation is located adjacent to the Project Area at the intersection of County Highway 9 and 290th Street. The OTP Substation is located adjacent to the Project Area, approximately ½-mile east of the Lyon County Substation, along 290th Street. A 345 kV transmission line transects the northern portion of the Project Area from east to west, parallel to 290th Street. Existing 69 kV transmission lines transect the middle of the Project Area from north to south and also from east to west along 290th Street in the western half of Section 28. Two 115 kV transmission lines parallel 290th Street in the western half of Section 28 as well as north to south along County Highway 9. In total, six transmission line segments intersect with or parallel the Project Area (Figure 2-1).

Transportation

The Project Area is bounded by paved and gravel roads. County Highway 9 (along much of the western boundary of the Project Area) and State Highway 19 (along the southern boundary) are the only two paved roads in the vicinity of the Project Area.

290th Street (east-west road through the middle of the Project Area) and 320th Avenue (along the eastern boundary) are the two gravel roads adjacent to the Project Area. The Project would be visible to motorists along these roads (Figure 2-1).

Recreation Areas

Rolling Hills and Green Valley Wildlife Management Areas ("WMA") are the two closest recreation areas and are located more than one mile from the Project Area. It is unlikely that users of these WMAs would have a view of the Project (Figure 4-2). There are no trails within or near the Project Area.

Historical Structures

A Phase Ia Literature Search was conducted for the Project (Appendix A). Neither the Phase Ia search nor numerous site visits and discussions with local residences revealed the presence of any historical structures within a viewable distance of the Project.

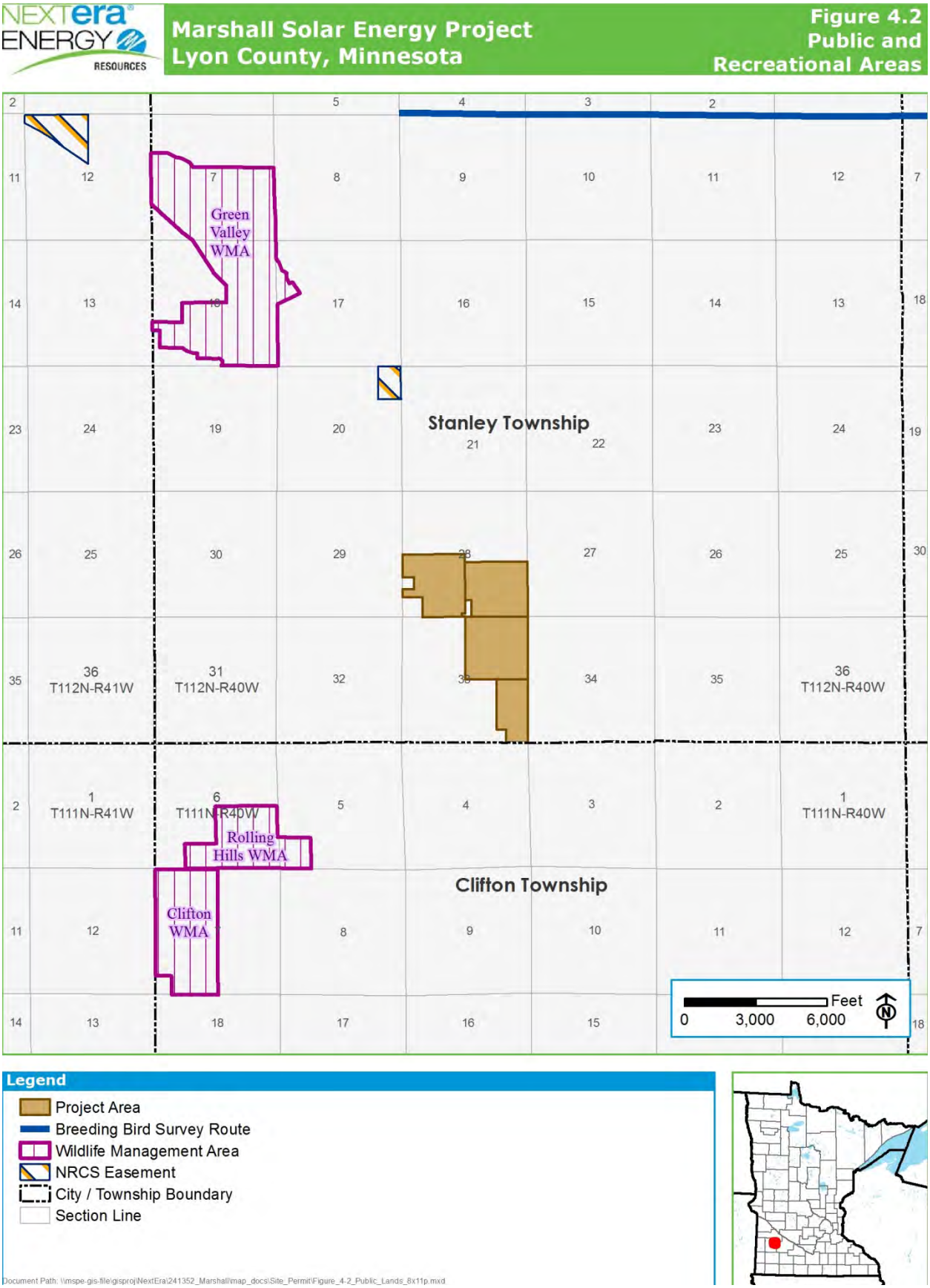
4.2.4.2 IMPACTS

The Project will convert approximately 474 acres of currently farmed fields into solar arrays and associated structures (i.e., inverters and collection systems). The solar arrays will be approximately eight to twelve feet tall; the PCS units will be approximately eight to ten feet tall; the 115 kV gen-tie line structures will be approximately 60 to 100 feet tall; the collector lines between each PCS unit will likely be buried underground; however, if a line is placed above ground, it would resemble a typical electrical distribution line commonly seem along residential roads. The collector line poles would be 30 - 50 feet tall if placed above ground. An eight foot tall, chain-link fence (without barbed wire) will be constructed around the perimeter of the site layout boundary. Visual simulations comparing the existing condition with the proposed condition were developed for this Project to illustrate the anticipated view-shed once the Project is constructed. These simulations, as well as a map depicting the simulation locations can be found in Appendix B.

Glare from the solar facility will be minimal. The individual solar panels that make up the solar arrays are designed to absorb as much sunlight as possible and are constructed with a non-reflective glass. Lighting at the facility will also be minimal. During operations, there will be no full time security lighting throughout the solar field or along the perimeter fence; however, motion-activated or timer-based service lighting would be placed in safety sensitive areas such as the O&M building, main gate, and Project substation. All lighting would be kept to the minimum required for safety and security and would also be shielded and directed to minimize off-site light.

Landscape

Visual impacts and overall changes in aesthetics will vary depending on the vegetative cover, viewer's distance from the Project Area, and a viewer's personal preferences on view-shed. Visual simulations from various Key Observation Points ("KOPs") around the Project Area suggest that the Project may be difficult to see from distances of ¼-mile or more (Appendix B). Additionally, as the viewer gets further from the Project Area, visibility may be limited due to changes in topography and natural or man-made objects.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Marshall Solar Energy Project
Lyon County, Minnesota
Figure 4.2
Public and
Recreational Areas
Green Valley WMA
Stanley Township
T112N-R41W
T112N-R40W
T111N-R41W
T111N-R40W
Rolling Hills WMA
Clifton WMA
Clifton Township
Feet
0 3,000 6,000
Legend
Project Area
Breeding Bird Survey Route
Wildlife Management Area
NRCS Easement
City / Township Boundary
Section Line
Document Path: \\mspe-gis-file\gisproj\NextEra\241352_Marshall\map_docs\Site_Permit\Figure_4-2_Public_Lands_8x11p.mxd

Human Settlement

Four homes / farmsteads are located adjacent to the Project Area and five more are located within ½-mile of the Project Area (Figure 4-1). The presence of small woodlots associated with these residences may reduce the visual impact of the Project to the residence, depending on the location of the woodlot in relation to the Project and the residence. Additionally, visual impacts will vary greatly depending on the distance the viewer is from the Project, as well as the intervening terrain between the viewer and the Project. It is important to note that the proposed Project would be sited in an area with a view-shed already significantly compromised by the existing transmission infrastructure, including six transmission line segments, and two electric substations.

Transportation

The Project would be most visible along the roadways adjacent to the Project: State Highway 19, County Highways 9, 290th Street, and 320th Avenue.

Recreation Areas

Users of nearby recreation areas would not likely experience a visual impact from the Project. The distances between these recreation areas and the Project, as well as well as intervening vegetation and terrain make it highly unlikely that there is clear line of site between the two.

Historical Structures

Since there are no historical structures in proximity to the proposed Project, visual impacts to historic structures are not expected.

4.2.4.3 MITIGATION

Adjacent landowners may be visually impacted by the Project. Marshall Solar will consider conducting additional visual simulations from nearby residences if requested by those landowners. Additionally, Marshall Solar will design the Project to maximize the distance between homes and solar facilities to the extent feasible. Vegetative screening can also be considered at the owner's request.

4.2.5 Socioeconomic Impacts

This section describes the socioeconomics of Project Area and the potential impacts of the Project on socioeconomics. Data from the U.S. Census Bureau and American FactFinder was used to determine the existing conditions of the Project Area.

4.2.5.1 EXISTING CONDITIONS

The population of Lyon County is approximately 26,000 with nearly 9,500 of those citizens living in the city of Marshall. The major industries in Lyon County include: education services, health care, manufacturing, and retail trade (U.S. Census Bureau 2012). The major land use in Lyon County is cultivated crops.

4.2.5.2 IMPACTS

There are no residences within the Project Area, although there are several residences adjacent to the Project Area. The Project will not displace any residences.

The Project will remove up to 500 acres of farmland from production; however, removal of a comparably small acreage from the total available acreage within the county is not expected to impact regional agricultural productivity.

The Project will have a positive economic impact on the local economy and deliver safe, clean, and reliable power to the state of Minnesota. The Project will be constructed over an approximately eight- to nine-month timeframe and during that time, Marshall Solar expects to employ an average monthly headcount of approximately 225 workers. This number will fluctuate during the construction process as various activities begin and end. The peak workforce is likely to be approximately 275.

Generally, Marshall Solar will contract with a local Engineering, Procurement, Construction ("EPC") contractor to construct projects and the workers / vendors employed by this EPC contractor can usually be hired locally if prospective workers possess the correct qualifications and skill set.

Sales and Use tax contributions to the state of Minnesota during the construction phase are expected to be approximately $500,000. Additionally, local businesses (stores, hotels, services, housing) will also benefit indirectly from the infusion of construction workers and activity during this time period.

During the 25- to 35-year operational life of the Project, Marshall Solar will staff the facility with two to three full-time employees who will be responsible for day-to-day operations of the Project. There will also be opportunities for local businesses to contract with Marshall Solar to provide specialized services on-site such as vegetation control, minor maintenance activities, internal road improvements, and similar work. The facility will also require office materials which can be sourced locally. Marshall Solar expects to contribute approximately $140,000 annually in state production taxes and an additional $40,000 annually in property taxes during the operational life of the Project. The production tax is paid to both the state of Minnesota (20%) and Lyon County (80%). All property taxes would be paid to Lyon County.

4.2.5.3 MITIGATION

Negative impacts to socioeconomic conditions are not expected. Mitigation measures are not proposed.

4.2.6 Cultural Values

This section provides information about the existing cultural values in the Project Area and describes identified values and possible effects from construction of the Project. Information from Discover Southwest MN and Marshall Area Chamber of Commerce was used for this discussion.

4.2.6.1 EXISTING CONDITIONS

The *American Communities Project* [4] uses information such as income, race, ethnicity, education, and religious affiliation to identify 15 types of counties in the US. In this system, Lyon County is considered Rural Middle America, characterized by a slightly wealthier and less racially diverse population. The overall land use in the county is agricultural, but the city of Marshall serves as a Service Worker Center community (Chinni and Gimpel, 2010) in that it includes a State University and many people work in sectors that service a college community (e.g., restaurants, retail establishments, etc.). Community events occur year round within the city of Marshall, many of which are associated with the University. One of the more popular events is the Marshall Sounds of Summer event that occurs in August.

4.2.6.2 IMPACTS

Some of the community may view the Project negatively in that the past agricultural nature of the site will be disrupted and there may be distrust of an unknown organization building a relatively new technology in their community. However, others in the community may see this development as self-reliant (renewable) and forward thinking / action oriented in that the community is supporting the national climate change agenda to invest in renewable sources of energy. Impacts to cultural values – including community events and activities - are not expected.

4.2.6.3 MITIGATION

Marshall Solar plans a continuous public outreach effort to provide information to community members who are unfamiliar with renewable energy projects of this type. Simultaneously, Marshall Solar will be gathering input from the community which will assist in the continuing development of the Project design. A discussion of public outreach to-date can be found in Section 5.

4.2.7 Recreation

This section describes recreation areas within and near the Project Area. Data from the DNR Recreation Compass and Southwest Minnesota Ride was used to determine the existing conditions of the Project Area.

4.2.7.1 EXISTING CONDITIONS

There are no federal, state, or local recreation areas within the Project Area. The nearest public lands are Rolling Hills / Clifton WMA and the Green Valley WMA, located approximately 1.5 miles southwest and northwest of the Project, respectively. These WMAs provide habitat and hunting opportunities for deer, small game, pheasants, and waterfowl (DNR 2014).

[4] http://www.american.edu/spa/american-communities

The Redwood River is located approximately one mile north of the Project Area and is considered a State Water Trail used for canoeing. There are no snowmobile, biking, or hiking trails within the Project Area or within one mile of the Project Area (Figure 4-2).

4.2.7.2 IMPACTS

Given the distances to the WMAs and the State Water Trail along Redwood River, as well as the intervening terrain and vegetation, it is unlikely that the Project would be visible from these recreational areas.

4.2.7.3 MITIGATION

Impacts to recreational activities are not expected. Mitigation measures are not proposed.

4.2.8 Public Services

This section describes public services and infrastructure within the Project Area and impacts this Project may have on public services. Data from the Minnesota GeoSpatial Information Office ("MNGeo") was used to determine the existing utilities in the Project Area.

4.2.8.1 EXISTING CONDITIONS

Public Services

Public Services are those typically provided by a government entity to its citizens and those services are used to benefit public health and safety. These services can include emergency services (e.g., fire, ambulance, and police), potable water, sanitary systems, and utilities. The city of Marshall is the closest municipality to provide emergency services. Lincoln-Pipestone Rural Water, a rural water service headquartered in Lake Benton, Minnesota, provides potable water service to the area surrounding the Project. Sewage is serviced by residential septic tanks and/or drain fields. According to the American Land Title Association ("ALTA ") Survey (Appendix C), CenturyLink provides communication service to the Project Area.

Public Utilities

An ALTA survey was performed on the Project Area and selected public utilities and infrastructure were located and mapped in the area immediately surrounding the Project (Appendix C). The survey mapped adjacent road rights-of-way ("ROW") but did not extend into the ROW to map existing utilities that might be co-located.

The Lyon County Substation is located adjacent to the Project Area at the intersection of County Highway 9 and 290th Street. The OTP Substation is located adjacent to the Project Area, approximately ½-mile east of the Lyon County Substation, along 290th Street. A 345 kV transmission line serves the Lyon County Substation and transects the northern portion of the Project Area from east to west, parallel to 290th Street. Existing 69 kV transmission lines transect the middle of the Project Area from north to south and also from east to west along 290th Street in the western half of Section 28. Two 115 kV transmission lines parallel 290th street in the western half of Section 28 as well as north to south along County Highway 9. In total, six transmission line segments intersect with or parallel the Project Area (Figure 2-1).

No gas pipelines intersect the Project Area.

Transportation

Major roadways in the area include State Highway 19 and County Highways 9 and 11. The Project Area is bisected by 290th Street and lies between County Highway 9 and 320th Avenue. Average Annual Daily Traffic counts as per MnDOT's 2012 survey are provided in Table 10 below.

Table 10. Average Annual Daily Traffic on Major Roadways

Roadway	Average Traffic Counts per Day
State Highway 19 (between County Highway 9 and eastward)	2,600
County Highway 9 (between 320th Street and State Highway 19)	240

Source: MnDOT 2012 Average Annual Daily Traffic Count

There are no airports within or near the Project Area; the nearest airport – the Southern Minnesota Regional Airport – is located approximately seven miles west of the Project Area. For a discussion on airport specifications, see Section 4.2.1.

4.2.8.2 IMPACTS

Public Services

Potential temporary impacts on public services, mainly emergency services, could occur if construction activities block or otherwise disrupt roadways and access. These impacts would be transient and limited to the construction period. Additionally, given the existing roadway network and the presence of numerous other potential routes, this disruption is expected to delay rather than prohibit emergency access to an incident location.

Impacts to public services during Project operations are not expected. Impacts to water and sewer services are not expected. The O&M facility may require water and sewer services from Lincoln-Pipestone Rural Water and Marshall Solar would coordinate with this utility to secure the services required. Marshall Solar expects the utility to have sufficient capacity to provide service to the Project without disruption existing users. Marshall Solar would design and install any required septic system in accordance with all applicable state and county standards.

Public Utilities

It is possible, although unlikely, that the Project's gen-tie line will cross underneath the existing 345 kV transmission line, which transects the Project Area from east to west. The Project will connect to the existing Lyon County Substation. NSP will be required to add additional equipment to the Substation to facilitate this interconnection pursuant to the MISO interconnection process. These additions are not expected to adversely impact the current operations of the Substation.

No changes to existing transmission lines or the Lyon County Substation footprint are expected. Marshall Solar will require access to fiber optic communications to facilitate remote monitoring and control of the Project as well as voice and data service at the O&M facility.

Marshall Solar is in the process of identifying the service provider and the locations of underground communication infrastructure. Marshall Solar expects the provider to have sufficient capacity to provide service to the Project without disruption existing users.

Transportation

Roadways in the area will be utilized during construction. It is possible that construction traffic could create congestion on these roads during peak construction periods. Roadways could also potentially be damaged during construction activities given the large volume of equipment deliveries that will be necessary to build the Project.

The Federal Aviation Administration's ("FAA") Notice Criteria Tool was used to determine if coordination or notice to the FAA is required. The Notice Criteria Tool uses land elevation and structure height to determine if hazards to an airport exist. Using the highest land elevation within the Project Area (1,120 feet) and the tallest possible structure height (100 feet for the gen-tie line) it was determined that Project infrastructure does not exceed the Notice Criteria.

4.2.8.3 MITIGATION

Public Services

Marshall Solar will coordinate with county and township officials if a road closure approval is required on county or township roads. Marshall Solar will also work with county and township officials to assign 9-1-1 addresses to appropriate structures and access roads within the Project Area to facilitate a timely response in the event of an emergency. None of the major Project facilities will be constructed within any county or township ROW.

Public Utilities

Marshall Solar plans to coordinate directly with the owners of the various transmission lines in the area to collaborate on any required crossings of those facilities. Any electric infrastructure constructed for the operation of the Project will adhere to NESC regulations and any other design requirements requested by the transmission owner / operator. Marshall Solar will notify Gopher State One Call prior to any construction activities to locate any underground utilities, which would be appropriately flagged in the field prior to construction to avoid impacts from construction activities.

Transportation

Marshall Solar will coordinate with the local road authorities to obtain a utility crossing permit of 290th Street for the construction of the electrical collection system. Marshall Solar will also coordinate with the county and township on the design and construction of entrance driveways off of a county highway or township road, a temporary road closure from construction, and/or overweight / over-width vehicle traffic on county highways or township roads. Marshall Solar will document the pre-construction road conditions by driving adjacent roadways to video-tape / photographing the existing gravel/pavement. At the conclusion of construction, Marshall Solar would repair any damaged roads to pre-construction conditions.

Paved Project roads will be maintained to preserve the asphalt surface from degradation. Marshall Solar may apply a sealant as necessary in order to prevent decay. Oxidation and potholes or other damage will be repaired as soon as practical.

Paved roads are only expected to include the main access road from County Highway 9 to the project substation and O&M building areas.

Unpaved roads would be maintained regularly to control the flow of water on and around the road, remove obstacles, and maintain a solid surface. Maintenance would be completed by conducting regular surveys to inspect the conditions of the road surfaces, blading, grading or compacting the road surfaces to preserve a minimally sloped and smooth planed surface.

Impacts to the Southern Minnesota Regional Airport are not expected; mitigation is not proposed.

4.3 Land-Based Economies

4.3.1 Land Use and Zoning

This section describes the land use and land cover within the Project Area and local ordinances applicable to the Project. Data from the Lyon County Assessor and the National Land Cover Dataset ("NLCD") was used to determine the existing conditions of the Project Area.

4.3.1.1 EXISTING CONDITIONS

Land Cover

The primary land use in the Project Area is agriculture with corn and soybeans being the dominant cultivated crops. Land adjacent to the Project Area is either used for home / farmstead sites or used for cultivated crops. Table 11 and Figure 4-3 describes the land cover types as classified by the NLCD.

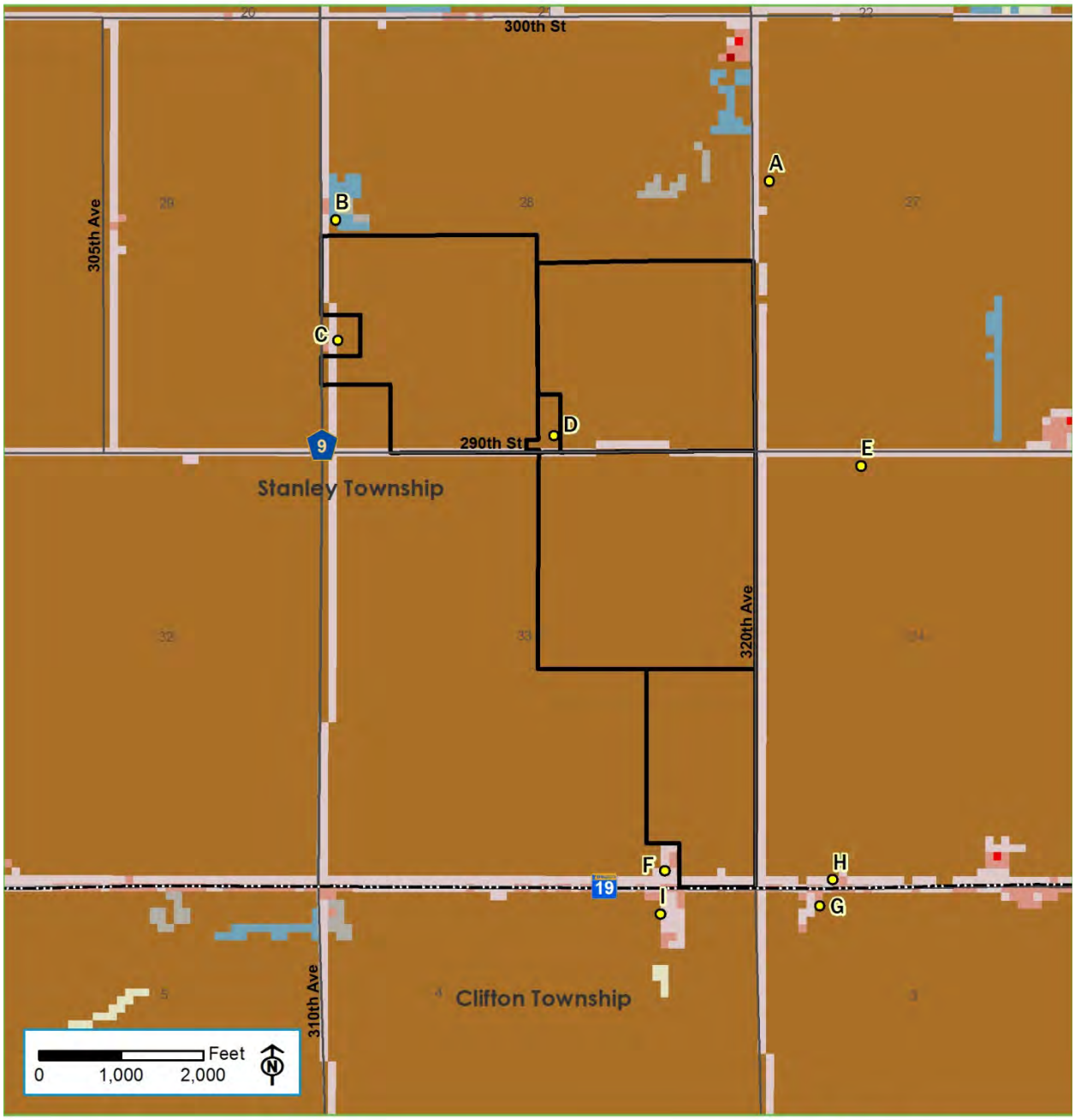
Table 11. Land Cover Types within the Project Area

Cover Type	Acreage	Percent of Project Area
Cultivated Crops	496	97.3
Developed, Open Space	13	2.5
Developed, Low Intensity	< 1	< 1

Source: NLCD

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 4.3
Land Cover



Legend

- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Grassland/Herbaceous
- Cultivated Crops
- Emergent Herbaceous Wetlands
- Project Area
- Residence
- City / Township Boundary
- Section Line

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Zoning

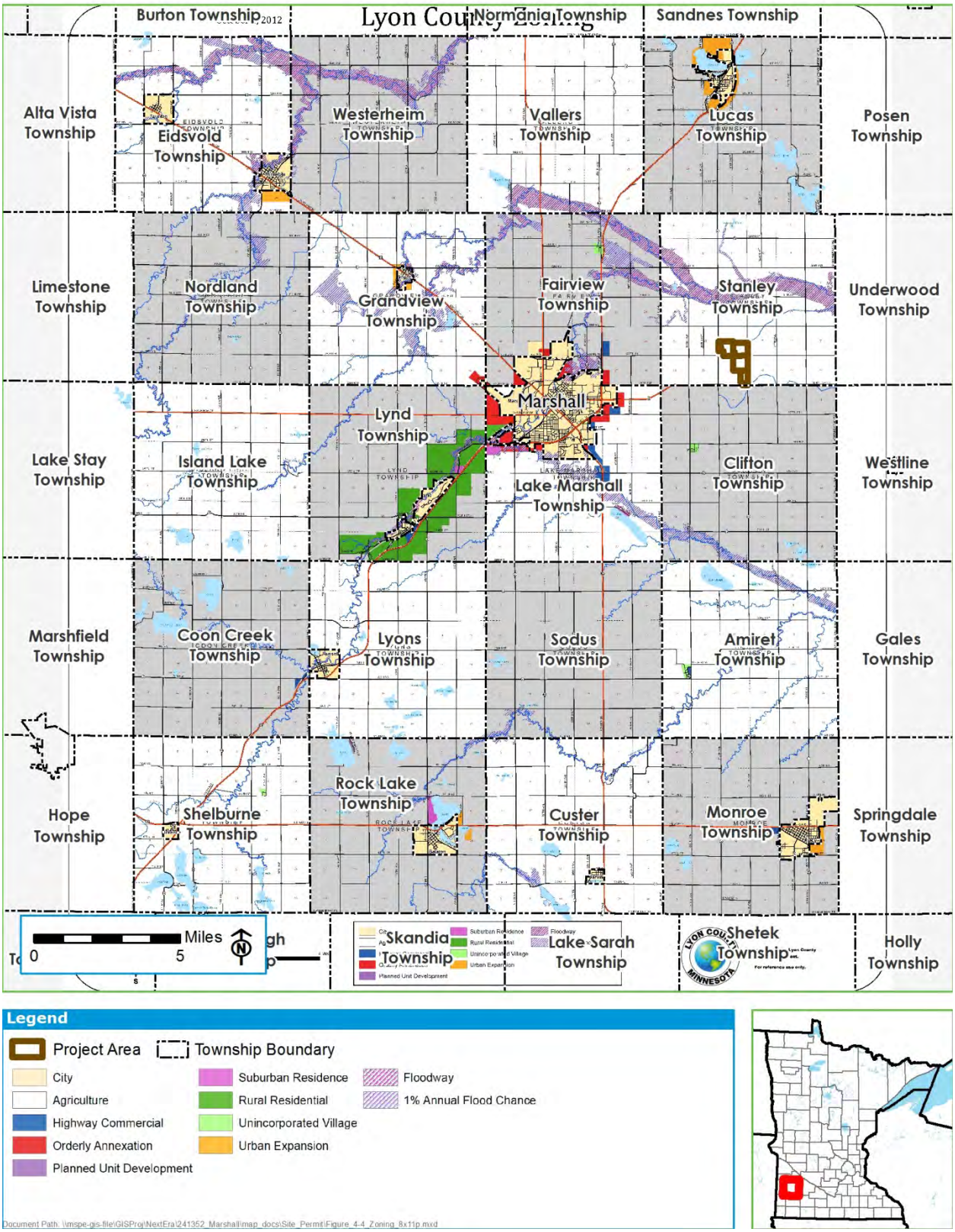
Zoning is used at the local level to regulate permitted land uses in Lyon County. The Project Area is zoned for agricultural use (Table 11) under Lyon County's current Comprehensive Plan. During construction and through operations, the Project Area would remain zoned as "Agriculture;" however, according to county planning and zoning officials, the Lyon County Assessor will adjust the tax classification for the property from "Agriculture" to "Essential Service."

Lyon County does not currently have specific energy facility ordinances; however, those ordinances related to "Essential Services" and others relevant to this Project were used as a guideline for Project development. The relevant Articles and Sections of the Lyon County Ordinances include:

- Section 8.5 Lot Size, Setback, Yard and Height Requirements
    - D.) There shall be a minimum setback of one hundred twenty (120) feet from the center of any county or judicial drainage ditch. Said setback requirements shall apply only to erection of and maintenance of all structures, buildings, trees and the like.
- Section 15.10: Additional Requirements, Exceptions, and Modifications
    - Fencing shall not exceed six feet in height except security fences which shall not exceed eight feet in height including barbed wire toppings.
- Section 18.4 Provisions for Major Essential Service Construction
    - B.1) All drainage facilities and patterns shall be repaired to pre-construction conditions as soon as possible after construction.
    - B.2) Debris shall be removed from the site within 90 days except between Nov 15 and April 15.
    - B.3) Shelterbacks, windbreaks, fences, and vegetation shall be restored to pre-construction conditions.
    - B.4) If preliminary engineering surveys or other documentation is provided, modifications to accommodate future drainage or roadway construction activities may be required.
    - B.5) Major essential service construction activities shall be conducted in such a manner as to minimize impacts on livestock movements and access to agricultural fields.
- Section 18.8 General Regulations
    - Any essential service line or essential service structure not located within a public ROW or any utility easement required by the Lyon County Subdivision Regulations shall be set back at least 90 feet from the centerline of any public road.

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 4.4
Lyon County Zoning



Marshall Solar is actively engaged with local zoning officials to ensure that other applicable zoning ordinances are considered; however, since the Project is a "large electric power generating plant" pursuant to Minn. Stat. § 216E.01, Subd. 5, it requires a Site Permit from the Commission under Minn. Stat. § 216E.03. Minn. Stat. § 216E.10 states that a Site Permit from the Commission:

> "...shall be the sole site or route approval required to be obtained by the utility. Such permit shall supersede and preempt all zoning, building, or land use rules, regulations, ordinances promulgated by regional, county, local, and special purpose government."

4.3.1.2 IMPACTS

Permanent impacts to Project Area and adjacent land uses, land cover, and zoning are not expected.

Land Cover

Impacts to land cover will occur throughout the Project Area during the 25- to 35-year Project lifecycle, as the land cover will be changed from cultivated crops to low-growing, native groundcover vegetation, Project infrastructure, or gravel access roads. As described in Section 3.2, grading, compaction, and trenching within the Project Area may occur in certain locations during construction.

Impacts to adjacent agricultural land use are not expected and adjacent property owners have every right to continue operations on their property. For a discussion on potential aesthetic impacts to adjacent landowners, see Section 4.2.4.

Zoning

The Project Area is zoned for agricultural use and will remain zoned as "Agriculture" during and after Project operation. For tax purposes only, the County Assessor will change the Project Area from "Agriculture" to "Essential Service" use for the duration of the Project life. This tax classification would be returned to "Agriculture" at the end of the Project's life. The land included in the Project Area will not be re-zoned and will remain zoned for agricultural use.

Relevant zoning Articles and Sections described above will be met and adhered to for the Project. Specifically;

- Perimeter security fencing for the Project will not exceed eight feet in height.
- Drainage facilities and patterns will be repaired if damaged by construction; however, given the method of direct-embed construction and the lack of knowledge as to where the drainage infrastructure is located, it may not be immediately possible to know if drainage faculties are damaged. Marshall Solar will coordinate with adjacent landowners to determine if drainage facility mitigation is required.
- If shelterbacks, windbreaks, fences, or vegetation located on adjacent property is damaged during construction, it will be restored to pre-construction conditions.
- Engineering drawings for the Project will be provided to local planning and zoning officials.

- Construction of the Project will occur on property that will no longer be used for farming, thus, no impacts to livestock movement or field access (for the purposes of farming) are expected.
- Project infrastructure (solar arrays, PCS units, and Project substation) are not currently located closer than 90 feet to the centerline of road ROW. Access roads may be located within 90 feet of a road ROW.

The Project is not expected to conflict with local zoning ordinances and the Commission's authority takes precedent in the overall jurisdiction to permit this Project; however, the local road authorities will likely require a utility crossing permit of 290th Street for the construction of the electrical collection system.

4.3.1.3 MITIGATION

Marshall Solar will continue to coordinate with the county and township on the design and construction of entrance driveways off of a county highway or township road, a temporary road closure from construction, and/or overweight / over-width vehicle traffic on county highways or township roads. Additionally, Marshall Solar will work with the DNR to develop a native seed mixture for the re-vegetation of the land cover within Project Area after construction. Marshall Solar will maintain the ground cover with standard lawn-equipment tools such as lawn mowers and string trimmers.

4.3.2 Agriculture

This section describes agriculture within the Project Area and the potential impacts of the Project on agriculture. Data from NLCD was used to determine the existing conditions of the Project Area.

4.3.2.1 EXISTING CONDITIONS

As noted in Section 4.3.1, approximately 97 percent (496 acres) of the Project Area is cultivated crop (Figure 4-3). Within the preliminary site layout there is approximately 360 acres of cultivated crop.

Prime farmland is defined by the U.S. Department of Agriculture ("USDA") Natural Resource Conservation Service ("NRCS") as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. 7 C.F.R. § 657.5(a). NRCS has three major levels for prime farmland and each county NRCS department is responsible for assigning prime farmland designations to each of the soil series found in its county. Prime farmland data is created by analyzing soil types found in each county, then assessing whether or not those soil types can sustain agricultural production. The NRCS Prime Farmland dataset can include areas of the county that are not currently being used for agricultural production; therefore, the acreages of prime farmland might not match the amount of agricultural land reported by the NLCD.

The three major categories of farmland identified by NRCS include: prime farmland, prime farmland if drained, and farmland of statewide importance. The most important class is prime farmland, which is capable of producing high yields of crops. Prime farmland when drained includes soils that have the potential to be prime farmland but require drainage or hydrologic alteration to achieve high productivity.

Farmland of statewide importance includes soils that are nearly prime, but are not as productive due to permeability, slope, erosion potential, or some other soil property.

The Project Area contains approximately 290 acres of prime farmland if drained, approximately 183 acres of prime farmland, and approximately 40 acres of farmland of statewide importance (Figure 4-5).

4.3.2.2 IMPACTS

Based on the current project plans and preliminary site layout, the Project will remove approximately 360 acres of cultivated crop from production (including all areas classified as prime farmland, prime farmland if drained, and farmland of statewide importance) for as long as the Project is operational. Impacts on agricultural lands from minimal grading, clearing, trenching, compaction, and excavation activities and transportation of materials will occur. Installation of the underground electric collection system and the solar array foundations may impact the sub-surface agricultural drain tile. When the Project is no longer operational, the current land could be returned to productive agricultural land use. The Project may benefit future agricultural production of the Project Area by allowing the soil to “rest.”

Minnesota Rule 7850.4400 provides:

> “.... No large electric power generating plant site may be permitted where the developed portion of the plant site, excluding water storage reservoirs and cooling ponds, includes more than 0.5 acres of prime farmland per megawatt of net generating capacity…unless there is no feasible and prudent alternative.”

Under this formula, the Project at a net generating capacity of approximately 62.25 MW would be limited to the use of 31.125 acres of prime farmland for the Project site.

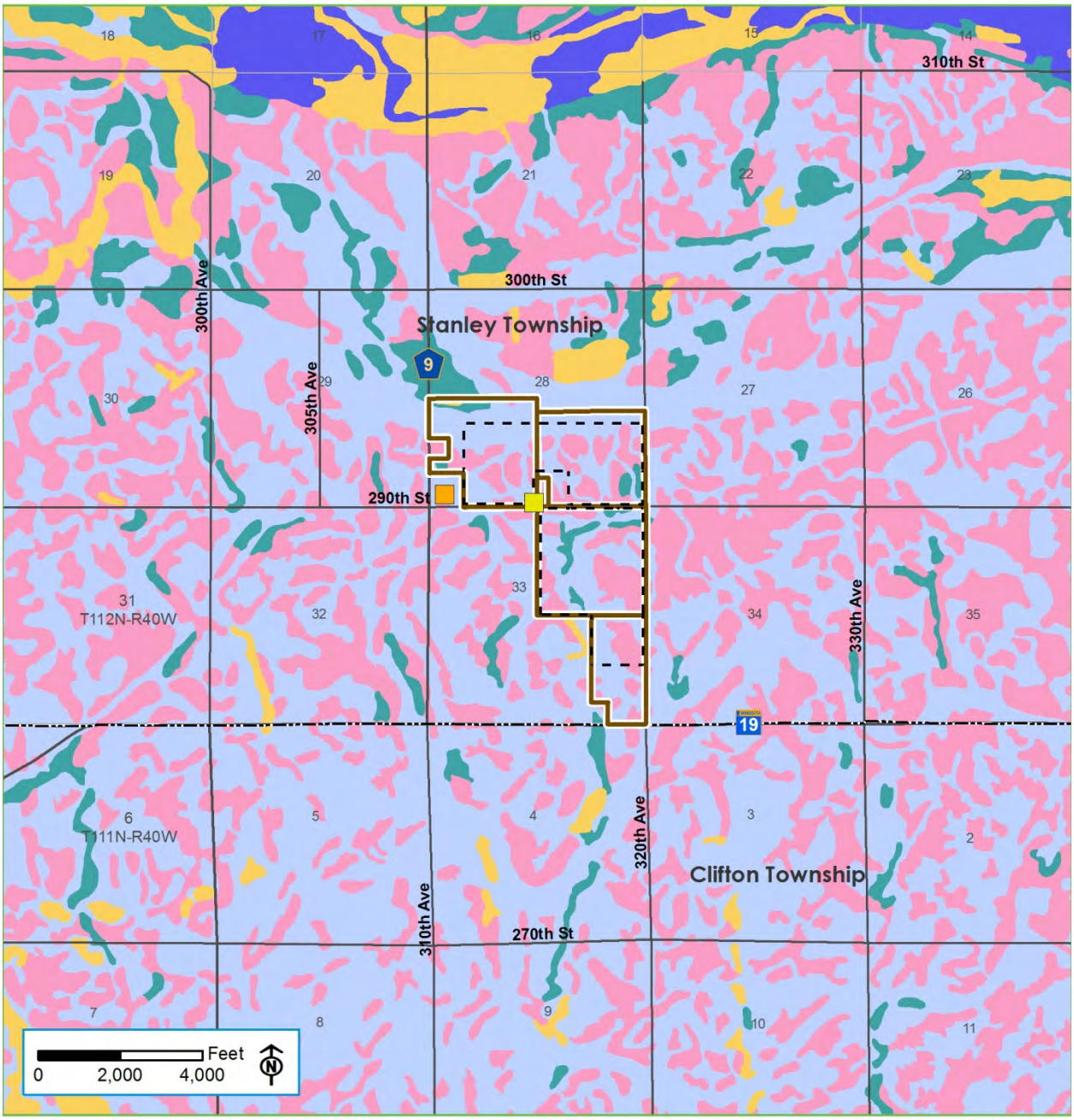
In evaluating the land use and infrastructure requirements for a large solar energy facility in Minnesota, Marshall Solar found that solar facilities similar in scope and scale to the Project will, in many circumstances, impact prime farmland. This is because large solar energy facilities require a large land area to achieve significant generating capacity, requiring between five and ten acres of land per megawatt of installed capacity depending on the technology installed.[5]

A cost-effective large solar energy facility requires a contiguous piece of property in a regular shape, ideally a square or rectangle. Additionally, the site should be located in open terrain, with unimpeded views of the sun to minimize the impacts of shading from off-site trees, buildings, or other obstructions. Finally, the site should be located as close as possible to existing transmission infrastructure and public roadways to minimize the need for additional infrastructure to connect the project to the electrical and roadway system.

[5] Solar Energy Industries Association, *Utility-Scale Solar Power Responsible Land Use*, available at http://www.seia.org/sites/default/files/usplandusefactsheet-120712125954-phpapp01-1_0.pdf (last visited October 17, 2014).

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 4.5
Prime Farmland Soils



Legend

- Project Area
- Fence
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance
- Not prime farmland
- Lyon County Substation
- Otter Tail Power Substation
- City / Township Boundary
- Section Line

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The proposed Project site meets all of those criteria, including proximity to the new Brookings County to Twin Cities 345 kV transmission line. As such, siting the Marshall Solar Energy Project is consistent with "the policy of the state to locate large electric power facilities in an orderly manner compatible with environmental preservation and the efficient use of resources … while insuring continuing electric power system reliability and integrity and insuring that electric energy needs are met and fulfilled in an orderly and timely fashion." See Minn. Stat. § 216B.02.

Potential sites closer to municipalities or major metropolitan areas (where there may be less prime farmland present) are generally more expensive on a per-acre basis, generally force a developer to compromise on other site characteristics, and tend to be in more densely populated areas that may not be appropriate for energy infrastructure development.

Any departure from the conditions outlined above ultimately results in a less efficient large solar energy facility, the need for additional energy infrastructure (e.g., transmission facilities), and a higher price of power.

It should also be recognized that the Minnesota Legislature recently passed into law the Solar Energy Standard, requiring 1.5 percent of each public utility's total retail electric sales to retail customers in Minnesota to be generated by solar energy, establishing that solar energy will be a significant part of the state's energy future. See Minn. Stat. § 216B.1691, Subd. 2f. In meeting the Solar Energy Standard, Marshall Solar believes that larger project sizes achieve efficiencies in equipment procurement and construction, which result in lower overall project costs related to development, construction, and operation. Considering the land requirements for large solar energy facilities and the economic viability of sites that do not impact prime farmland, the most prudent and feasible means of achieving the legislative mandate for solar energy likely requires the use of prime farmland in excess of the standard set in Minn. R. 7850.4400, Subp. 4. Indeed, in NSP's October 24, 2014 Petition seeking approval of a long term PPA with Marshall Solar notes in Docket No.: E-002/M-14-162 NSP confirmed that the Marshall Solar Energy Project was selected as part of a competitive RFP process "[t]o help fulfill its obligations under" Minn. Stat. § 216B.1691, Subd. 2f(a)-(c).[6] In selecting the Marshall Solar Energy Project, NSP determined that the Project was among the most cost effective projects available for NSP to meet its solar energy obligations. The Commission confirmed the same in approving the PPA between Marshall Solar and NSP at its February 12, 2015 agenda meeting.

Further, it should be recognized that the Project would only temporarily displace the current agricultural activities on prime farmland at the property; it will not change the physical integrity of the farmland or its soils. The extent of the improvements on the Project site will consist primarily of driven posts or pilings, underground cabling, small concrete foundations for the inverters and transformers, and primarily gravel roadways. All of these improvements can be removed at the conclusion of Project's 25- to 35-year useful life and the Project site restored to a condition similar to its present condition with little or no long-term impact post-decommissioning. In addition, as discussed in Section 4.3.2.3 below, any impacts on prime farmland will be mitigated and temporary.

[6] *See* NSP's October 24, 2014 Petition in Docket No.: E-002/M-14-162 at p. 1 ("NSP PPA Petition").

Indeed, as part of its efforts to reduce the Project's impact on prime farmland, Marshall Solar met with the MN Department of Agriculture and discussed potential impacts and proposed mitigation. Marshall Solar will continue to coordinate with the Department of Agriculture to develop an Agricultural Impact Mitigation Plan.

Use of the Project site for solar electric generation will provide the soils with a rest period from agricultural activities such that, when the Project is decommissioned and the facilities are removed at the conclusion of the Project, the soil's organic content and fertility may be greatly increased.

The operation of large solar energy facility of this type does not require the on-site storage or use of any large quantities of hazardous materials – the main use of any type of chemical would be transformer oil and small quantities of herbicide to control vegetation around equipment. Thus, at the conclusion of the Project, it is expected that the Project site would be fully suitable to return to productive agricultural use and may once again be classified as prime farmland.

In this sense, the Project's temporary occupation of prime farmland is analogous to conservation programs whereby cropland is "set aside" for a period of time, thereby reducing soil erosion and improving water quality.

Finally, the Commission's permitting of the use of prime farmland for large solar energy facilities is consistent with established policy for other renewable generation facilities. Notably, large wind energy facilities, are often located in areas with large amounts of prime farmland, are not subject to the prime farmland exclusion under Minn. R. 7850.4400, Subp. 4 because large wind energy facilities are subject to a separate site permit process under Minnesota Rules Chapters 7854. These separate rules applicable to large wind energy facilities do not contain the same prime farmland exclusion in Minn. R. 7850.4400, Subp. 4 or any similar provision limiting the issuance of Site Permits to large wind facilities based on the use of prime farmland

In contrast, large solar energy facilities are permitted under the Chapter 7850 rules, which include the restriction on prime farmland utilization. The applicability of the prime farmland exclusion to large solar energy facilities was likely unanticipated as no large scale solar projects have been permitted under Minnesota Statutes Chapter 216E and Minn. R. Chapter 7850. According to the Solar Industry Association, only 18 MW of solar energy is currently installed in Minnesota.[7] Indeed, absent the passage of the Solar Energy Standard, it is unlikely that utility scale solar would have been developed in Minnesota in the near future.

In this respect, the prime farmland exclusion applicability to large solar energy facilities does not appear to have resulted from any affirmative or deliberate policy decision related to solar technology or solar projects. Thus, varying the application of the prime farmland exclusion to large solar energy facilities would not be inconsistent with policy directives related to solar energy or with the treatment of similar technologies such as wind energy. Accordingly, Marshall Solar respectfully requests that in issuing a Site Permit for the Marshall Solar Energy Project the Commission make an affirmative finding that there is no feasible and prudent alternative as required by Minn. R. 7850.4400, Subp. 4 or otherwise waive the application of this rule for good cause shown.

[7] *See* http://www.seia.org/state-solar-policy/minnesota-solar.

4.3.2.3 MITIGATION

Impacts to agricultural land will occur since approximately 360 acres of farmland will be removed from production for the duration of the Project's life. However, as discussed above, the Project will only temporarily displace the current agricultural uses and will permit the agricultural land to "rest" during the Project duration.

Marshall Solar intends to take steps to minimize any impact to the existing drain tile system; however, any tile that is damaged during the construction process will be repaired or replaced. The county ditch and tile system currently operating on portions of the property will be left undisturbed and will continue to function at its current capacity.

Minimal grading will be done on the site as Project infrastructure can generally conform to small changes in topography. Some areas may require grading such as the Project substation, O&M facility, and PCS units. Native soil will be retained to the extent possible (e.g., used for backfill during construction). Marshall Solar will also coordinate with the DNR to develop an appropriate low-growing, vegetative ground cover to stabilize the soil during the operation of the Project.

The decommissioning plan outlined in Section 3.5 describes restorative measures which will be taken once the Project is no longer operational.

Marshall Solar will continue to coordinate with the MN Department of Agriculture to develop an appropriate Agriculture Impact Mitigation Plan.

4.3.3 Forestry

There are no forest stands within the Project Area. Forest stands adjacent to the Project Area are primarily used for wind breaks around homes and structures. Marshall Solar unaware of the potential for these stands to be used in the future as saleable timber.

Forestry does not occur in the Project Area, therefore impacts are not expected and mitigation measures are not proposed.

4.3.4 Tourism

As noted in Section 4.2.7, there are no recreation areas or trails within the Project Area or within one mile of the Project Area.

Impacts to tourism are not expected and mitigation measures are not proposed.

4.3.5 Mining

This section describes mining operations within the Project Area vicinity and the potential impacts of the Project on those resources. Data from MnDOT and the U.S. Geological Survey ("USGS") were used to determine the existing conditions of the Project Area.

4.3.5.1 EXISTING CONDITIONS

There are no metallic mineral resources, including both ferrous and non-ferrous minerals, actively mined in Lyon County. Currently, there are no aggregate resources within one mile of the Project Area. Based on the 1986 Tracy Quad topographic map, it appears as though an aggregate mining operation occurred adjacent to the Project Area in the northeast quarter of Section 28, Stanley Township.

Historic aerial photographs also indicate land disturbance characteristic of mining operations for a short period. It is difficult to determine when mining activities began on this parcel; however, in the 1991 historic aerial photograph, the parcel appears to be re-vegetated.

4.3.5.2 IMPACTS

Mining operations do not currently or actively occur in the Project Area, therefore impacts are not expected.

4.3.5.3 MITIGATION

Impacts to mining operations are not expected. No mitigation measures are proposed.

4.4 Archaeological and Historic Resources

This section describes the archaeological and historic resources within the Project Area and the potential impacts of the Project on those resources. Data from the SHPO, the Office of the State Archaeologist, and General Land Office was used to determine the existing conditions of the Project Area.

4.4.1.1 EXISTING CONDITIONS

The Project Area lies within the Prairie Lakes archaeological region of Minnesota. This region was historically prairie and offered typical prairie resources to past inhabitants. According to Anfinson (1990), major camps would have been located near the wooded areas surrounding major lakes and streams. Resource procurement areas, such as bison kill sites or prairie plant harvesting areas, could be anywhere in the uplands, but because of extensive agricultural tillage, many of these types of small, ephemeral activity sites were disturbed and scattered by conversion to cultivation.

The Project Area is not located near any large lake or streams and while the now-drained wetlands and sloughs in the area would have offered waterfowl hunting opportunities, the archaeological remains of such activities are typically scant. In addition, the flat, featureless landscape offers no prominent vantage point for observing game or for Native American ceremonial activities. Any cultural material found in the Project Area would most likely be related to the historic agricultural period.

A Phase Ia Literature Search was conducted for the Project Area (Appendix D). The results of the literature search concluded that no previously recorded archaeological sites or architectural properties were identified in the Project Area or within one mile of the Project Area

4.4.1.2 IMPACTS

As there were no previously identified archaeological or historical resources within proposed Project Area, impacts to resources are not expected. A thorough field survey has not been undertaken; however, there is a low probability that some resources may be buried and hold intact cultural features below the plow zone.

4.4.1.3 MITIGATION

Early coordination with the SHPO concluded that the results of a Phase Ia Literature Search would dictate whether or not field surveys would be required (Gragg-Johnson email, Appendix F). Marshall Solar submitted the Phase Ia Literature Search to the SHPO in February 2015 (Appendix D). Marshall Solar will continue to coordinate with the SHPO to determine any future action, including any additional inventory and evaluation studies or mitigation strategies. Any additional surveys or reports would be provided for review.

Avoidance of known resources is the first course for mitigating adverse effects. Typically, if archaeological resources cannot be avoided, formal evaluation and data recovery operations, or other mitigation methods that are agreed upon by the SHPO would suffice.

4.5 Natural Environment

4.5.1 Air Quality

This section describes the air quality within the Project Area and the potential impacts of the Project on air quality. Air Quality Standards and other information was collected from EPA and Minnesota Rules.

4.5.1.1 EXISTING CONDITIONS

Air quality generally is determined by comparing monitored pollutant concentrations with prescribed standards. The maximum level of a pollutant considered to be acceptable is specified by EPA. The Clean Air Act established two types of National Ambient Air Quality Standards. The primary standards set limits to protect public health and secondary standards set limits to protect public welfare (United States Code [USC] 7409). EPA Office of Air Quality Planning and Standards has set NAAQS for the following six criteria pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb). In addition, the state of Minnesota has set Ambient Air Quality Standards for hydrogen sulfide (H_2S) and particulate matter.

Certain regions of the country, as designated by the Clean Air Act, require special attention in regard to protecting and even improving air quality in those areas. The Project Area is not located in any special air quality areas.

4.5.1.2 IMPACTS

During construction of the Project, minimal, temporary, and localized impacts on air quality may occur due to the disturbance of topsoil (which raises fugitive dust particles) and by construction vehicles. Operation of the Project will not impact air quality.

4.5.1.3 MITIGATION

Marshall Solar will employ Best Management Practices (“BMPs”) as outlined in the NPDES Stormwater Pollution Prevention Plan (“SWPPP”) for Construction as required by the PCA. The SWPPP will include sediment and erosion control measures and re-vegetation/site stabilization plans.

4.5.2 Topography

This section describes the topography within the Project Area and the potential impacts of the Project on topography. Data from the USGS was used to determine the existing conditions of the Project Area.

4.5.2.1 EXITING CONDITIONS

The Project Area is relatively flat with elevation ranging from 1,090 feet to approximately 1,120 feet above mean sea level. The area south of 290th Street has the greatest change in elevation and has slightly rolling terrain (Figure 4-6).

4.5.2.2 IMPACTS

Temporary or permanent impacts on regional topography are not expected. Impacts to local topography in the Project Area will result from minimal grading in specific areas, clearing, trenching, compaction, and excavation activities.

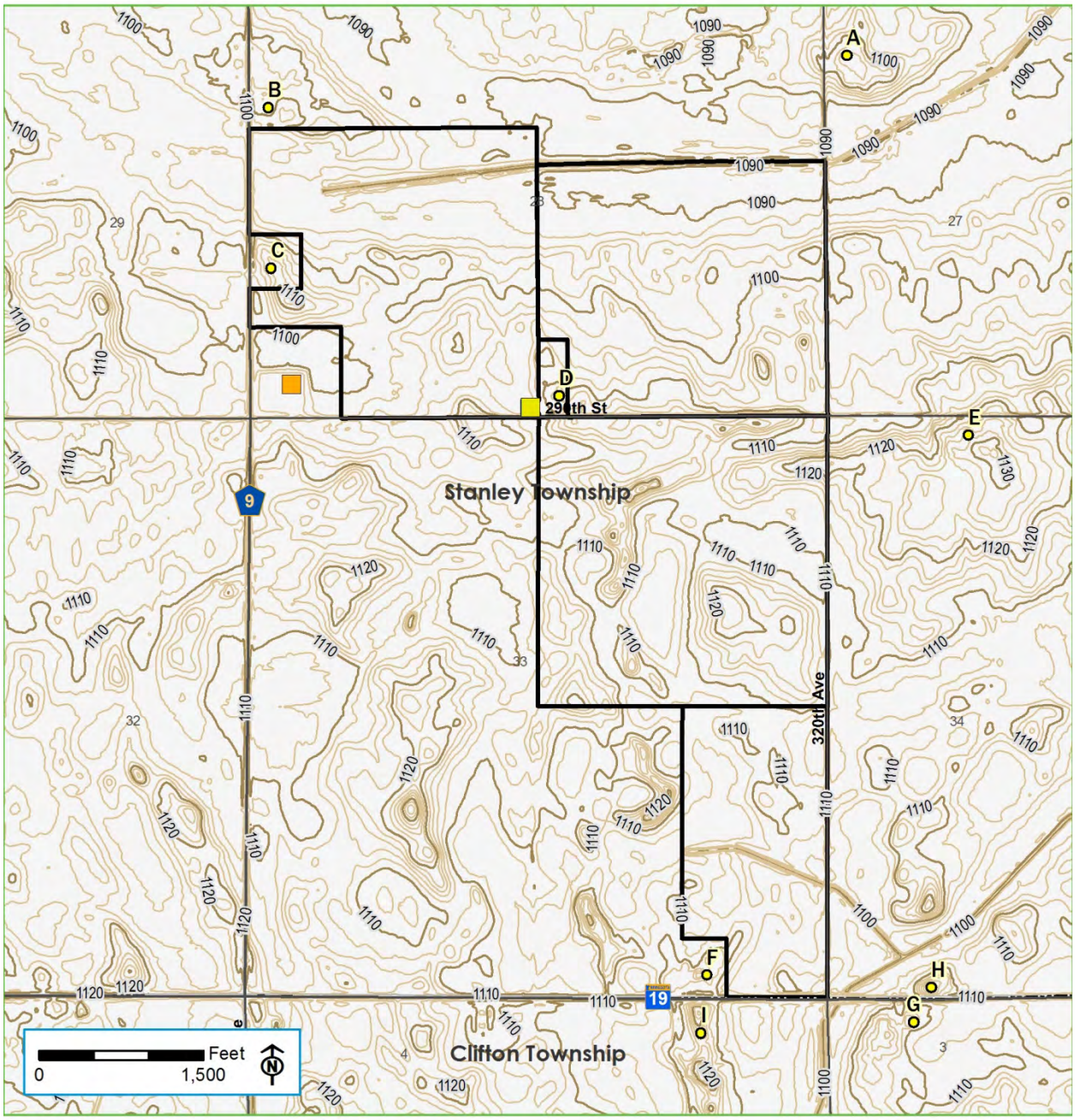
Any impact would be limited to specific areas within the Project Area. Marshall Solar's selection of a fixed racking system for the solar arrays accommodates the minor undulations in the terrain and avoids the need for mass grading at the site.

4.5.2.3 MITIGATION

Impacts to regional topography are not expected. Impacts to local topography are minimal. See Section 4.5.4 for mitigation measures relating to soil disturbance.

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 4.6
Topography



Legend

- Project Area
- 10' Elevation Contour
- 2' Elevation Contour
- Lyon County Substation
- Otter Tail Power Substation
- Residence
- City / Township Boundary
- Section Line

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4.5.3 Geologic and Groundwater Resources

This section describes the geologic and groundwater resources within the Project Area and the potential impacts of the Project on those resources. Data from the Minnesota Geological Survey, USGS, and the DNR was used to determine the existing conditions of the Project Area.

4.5.3.1 EXISTING CONDITIONS

Less than 100 feet of unconsolidated sediments overlie bedrock at the Project Area (Olsen and Mossler 1982). The unconsolidated sediments are Late Pleistocene-age glacial materials deposited in a ground moraine by the southern part of the Des Moines Lobe. This glacial material typically contains over 50 percent clay and silt, and shale and limestone clasts are common (Hobbs and Goebel 1982). Construction logs for wells within one mile of the Project Area indicate one to two feet of topsoil at the ground surface underlain by glacial deposits (clay) extending to approximately 30 to 40 feet below ground surface. Bedrock at the Project Area consists of Cretaceous-age undifferentiated shale and sandstone. Underlying the Cretaceous rocks are Precambrian-age gneissic rocks approximately 3.5 billion years old (Jirsa et al. 2011).

Minnesota has a low probability of seismic activity. No earthquakes have been recorded in Lyon County.

According to DNR monitoring wells, the water table in the Project Area ranges from about six to ten feet below ground surface. Groundwater flows to the north-northeast towards the Redwood River (Brandt 1997). Water table wells are not common in the area due to thick sequences of hard clay precluding successful shallow wells. Buried artesian aquifers, generally comprised of sand and gravel glacial outwash and often no more than ten feet in thickness, are present but not widespread in the Project Area. The Cretaceous bedrock represents the most commonly used aquifer near the Project Area, primarily because the overlying sediments are less than 100 feet thick and often lack a suitable aquifer. According to the online County Well Index, there are 13 domestic wells located within one mile of the Project Area, all but one of which are installed in the Cretaceous sandstone and shale aquifers at depths of 30 to 350 feet. The closest mapped wells are located at homesteads adjacent to the northeast and southwest of the Project Area. There are no mapped wells within the Project Area. The potentiometric surface of the Cretaceous aquifers ranges from 30 to 80 feet below ground surface. The Precambrian gneissic rock is not an important aquifer in the region.

4.5.3.2 IMPACTS

The Project Area will require minimal excavation or surface grading as the Project will be designed to conform to the local topography. Surficial deposits are generally greater than 100 feet thick and bedrock is not expected to be encountered. Temporary or permanent impacts on the geology of the Project Area are not expected.

Impacts to groundwater are not expected as the Project infrastructure will not disturb the aquifers located at depths of at least 30 below ground surface. Because herbicide and pesticide use will be significantly reduced from current agricultural practices, indirect positive impacts on surface and groundwater quality may occur.

During operations, if an O&M facility is constructed at the Project site, groundwater wells or utility provided water will provide a water supply for the O&M facility sanitary system as well as for emergency firefighting. Marshall Solar is evaluating the frequency of panel washing required at this Project site. Given the levels of precipitation in the area, both during the summer and winter, panel washing may not be required on a regular basis. This analysis will continue and if Marshall Solar determines that washing is required, it would be conducted by contractors under Marshall Solar staff supervision and utilize water from commercially available sources.

Wells would be permitted and installed in accordance with all state and county regulations. Marshall Solar is considering options for treatment of groundwater or the importation of trucked potable water to meet the potable water requirements for operation and maintenance. If the groundwater option is selected, water would be treated with a conventional package water treatment system.

During operations, the sanitary wastewater system will collect sanitary wastewater at the O&M building. The sanitary wastewater from sinks, toilets, showers, other sanitary facilities in the O&M building will be discharged to a sanitary septic system and on-site leach field. The septic system would be designed and permitted in accordance with all state and county regulations.

4.5.3.3 MITIGATION

Impacts to geology and groundwater are not expected. Mitigation measures are not proposed.

4.5.4 Soils

This section describes the soil resources within the Project Area and the potential impacts of the Project on those resources. Data from the USDA Soil Service Geographic Database ("SSURGO") was used to determine the existing conditions of the Project Area.

4.5.4.1 EXISTING CONDITIONS

Soils in the Project area are generally well-drained soils typically associated with cultivated fields. Twelve different soil types occur in the Project Area. Table 12 and Figure 4-7 list and describe the soil types within the Project Area.

Table 12. SSURGO Soil Series within the Project Area

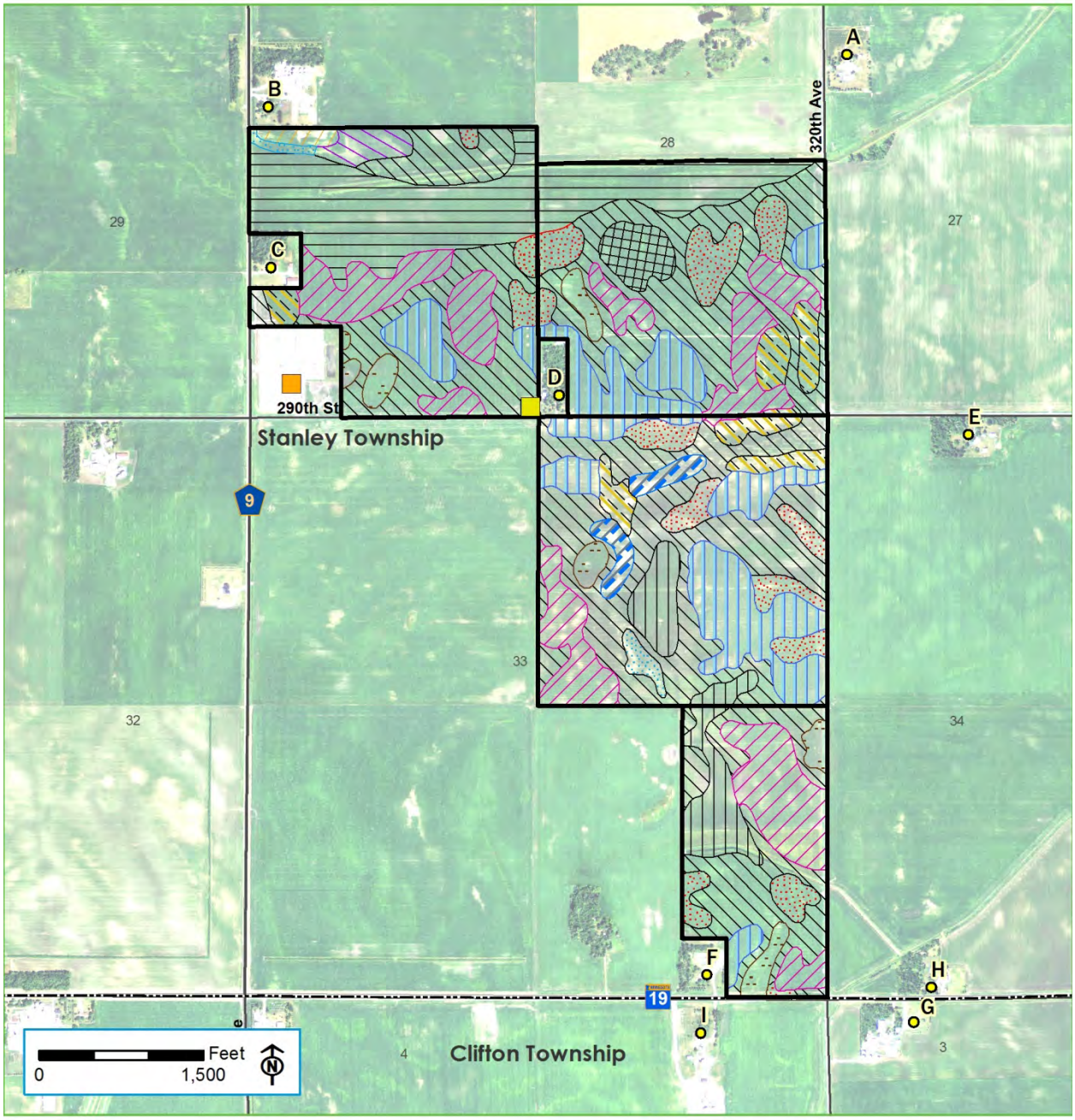
Soil Type	Description
Amiret loam	Very deep, well drained soils typically associated with cultivated fields.
Amiret-Swanlake loams	Very deep, well drained soils typically associated with cultivated fields.
Arvilla sandy loam	Very deep, somewhat excessively drained soils typically found on an east-facing slope of cultivated fields.
Arvilla-Storden-Ves complex	Very deep, well drained soils typically found on convex slopes in cultivated fields.
Canisteo clay loam	Very deep, poorly / very poorly drained soils typically found on rims of depressions in cultivated fields.
Fordville loam	Very deep, well drained soils typically associated with slightly convex slopes in cultivated fields.
Glencoe silty clay loam	Very deep, very poorly drained soils typically associated with depressions in cultivated fields.
Marysland loam	Very deep, very poorly drained soils associated with stream channels or outwashes in drained cultivated fields.
Oldham silty clay loam	Very deep, very poorly drained soils in cultivated fields.
Seaforth loam	Deep, moderately well drained soils typically in low relief areas in cultivated fields.
Storden-Ves loams	Very deep, well drained soils typically found on convex slopes in cultivated fields.
Sverdrup sandy loam	Very deep, well drained soils typically associated with cultivated fields.

Source: SSURGO Soil Data for Lyon County, Minnesota. USDA NRCS (2014).

Prime Farmland as identified by the NRCS is largely based on soil fertility and arability; Prime Farmland is discussed in Section 4.3.2 and shown in Figure 4-5.

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 4.7
Soils



Legend

- Amiret loam
- Amiret-Swanlake loams
- Arvilla sandy loam
- Arvilla-Storden-Ves complex
- Canisteo clay loam
- Fordville loam
- Marysland loam
- Glencoe clay loam
- Oldham silty clay loam
- Pits, gravel
- Seaforth loam
- Storden-Ves loams
- Sverdrup sandy loam
- Project Area
- Lyon County Substation
- Otter Tail Power Substation
- Residence
- City / Township Boundary
- Section Line

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4.5.4.2 IMPACTS

Impacts to soil resources will be temporary and will vary based on the conditions of the soil during construction. Soil will be disturbed by site clearing, grading, trenching, compaction, and excavation. Soil compaction may occur from laydown or staging areas, and movement of equipment and vehicles along temporary access roads. Soil erosion may occur if vegetation is removed and during large storm events; however, during operation, the land beneath the arrays will be covered with groundcover vegetation which may improve erosion issues that normally occur with agricultural practices.

4.5.4.3 MITIGATION

Marshall Solar will continue to coordinate with the MN Department of Agriculture to develop an appropriate Agricultural Impact Mitigation Plan that will include mitigative measures for topsoil erosion and sedimentation. Marshall Solar will employ BMPs as outlined in the NPDES SWPPP for Construction as required by the PCA. The SWPPP will include sediment and erosion control measures and re-vegetation/site stabilization plans. Marshall Solar will work with the DNR to develop a native seed mixture for the re-vegetation of the land cover within Project Area after construction.

4.5.5 Water Resources and Floodplains

This section describes water resources and floodplains within the Project Area and the potential impacts of the Project on those resources. Data from the DNR Public Water Inventory ("PWI") and Federal Emergency Management Agency ("FEMA") was used to determine the existing conditions of the Project Area.

4.5.5.1 EXISTING CONDITIONS

Surface Water

As shown in Figure 4-8, two DNR PWI watercourses are located adjacent to the Project Area. No PWI watercourses or basins are located within the Project Area. Two county drainage ditches are located within the Project Area; one through the center of Section 28 and one in the southeast portion of Section 33. These drainage ditches connect the agricultural drain tile systems in the area. The drainage ditches are not DNR public waters and therefore, the area immediately adjacent to the ditches is not considered 'shoreland' (Minn. R. 6120.2500, Subp. 15) nor managed by the DNR Shoreland Management Program.

Floodplains

There are no mapped FEMA floodplains within the Project Area or within one mile of the Project Area.

4.5.5.2 IMPACTS

Impacts to PWI watercourses or basins and county drainage ditches are not expected. Impacts to surface water flow across the Project Area are not expected since the Project will seek to maintain the existing grade to the extent feasible and to allow the existing drain tile system to continue operating. Impacts to sub-surface agricultural drain tile is expected.

4.5.5.3 MITIGATION

Where trenching for the underground electrical collection system occurs, crews will diligently monitor the area for exposed or damaged tile. In the event tile is damaged, it will be repaired. Where direct-embed pole construction occurs, it will be difficult to determine if damage to tile has occurred. Marshall Solar intends to make every effort to locate the existing drain tile in order to avoid damaging the system during construction and will communicate with adjacent landowners to address drainage issues that are identified as a result of construction activities.

Marshall Solar will employ BMPs as outlined in the NPDES SWPPP for Construction as required by the PCA. The SWPPP will include sediment and erosion control measures and re-vegetation/site stabilization plans.

4.5.6 Wetlands

This section describes wetlands within the Project Area and the potential impacts of the Project on those resources. Data from the DNR and wetland delineation information was used to determine the existing conditions of the Project Area.

4.5.6.1 EXISTING CONDITIONS

A wetland delineation was conducted on the Project Area in summer 2014 and the delineation report was submitted to the USACE and the Lyon County Soil and Water Conservation District ("SWCD") in late fall 2014 (Appendix E).

The USACE and SWCD concluded that jurisdictional wetlands do not occur within the Project Area with the exception of the county drainage ditches (Figure 4-8 and Appendix F).

4.5.6.2 IMPACTS

Impacts to wetlands are not expected and the two county drainage ditches will be avoided by Project infrastructure. In the event that either of the ditches required a crossing, Marshall Solar would install overhead spans that completely avoid the footprint of the ditch or bore underneath the ditch at a sufficient depth to avoid any impacts. Lyon County zoning does not have ordinances specific to solar development; however, under Section 8.5, Subp. D of the Lyon County Zoning Ordinance:

> "There shall be a minimum setback of 120 feet from the center of any county or judicial drainage ditch. Said setback requirement shall apply to erection of and maintenance of all structures, buildings, trees and the like."

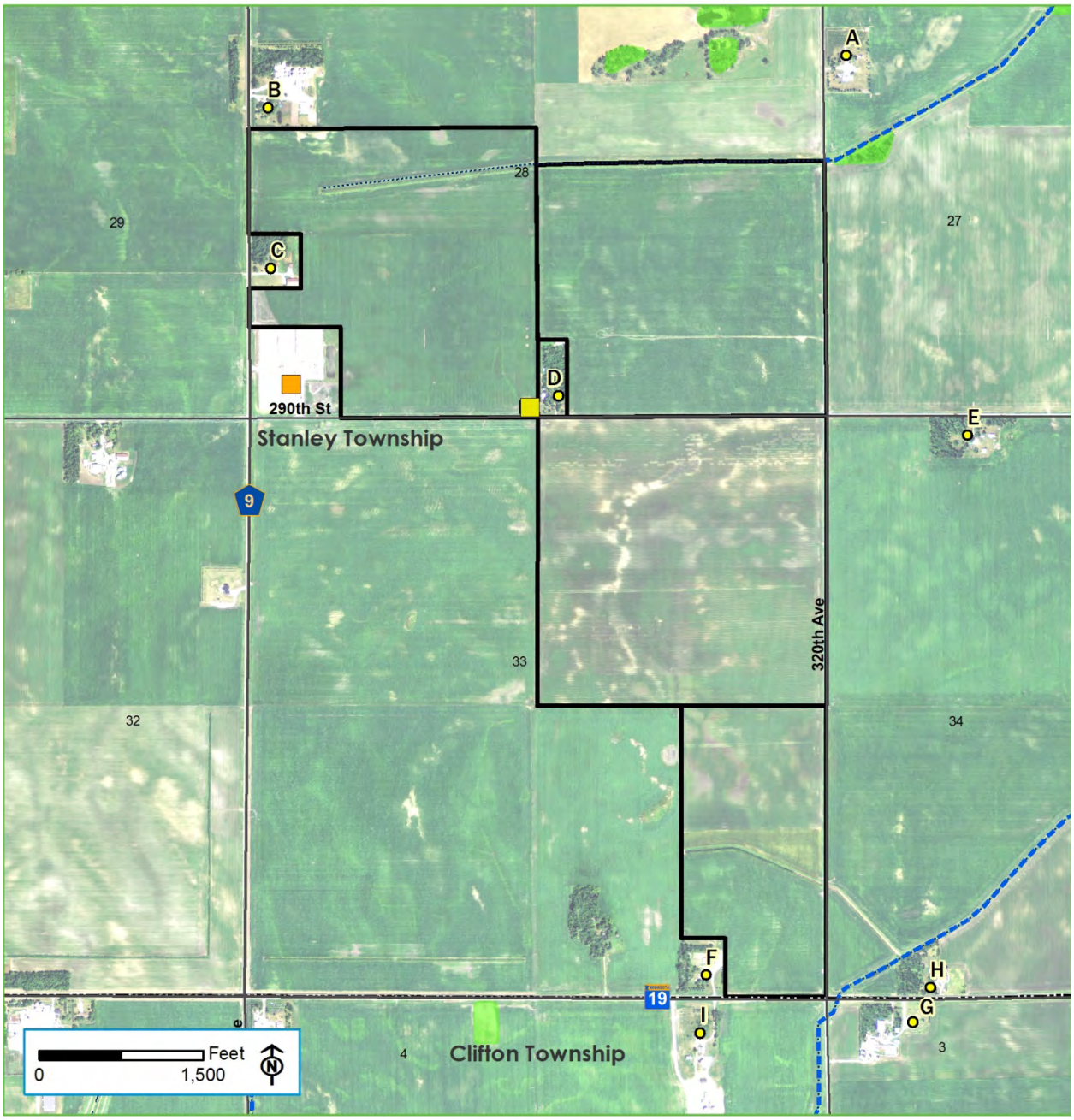
The current site layout adheres to the 120-foot setback from county ditches.

4.5.6.3 MITIGATION

Impacts to wetlands and county drainage ditches are not expected. Mitigation measures are not proposed; however, Marshall Solar will employ BMPs as outlined in the NPDES SWPPP for Construction as required by the PCA. The SWPPP will include sediment and erosion control measures and re-vegetation/site stabilization plans.

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 4.8
Water Resources



Legend

- Study Area
- Lyon County Substation
- Otter Tail Power Substation
- Residence
- PWI Stream
- Perennial River / Stream
- Intermittent River / Stream
- Drainage
- PWI Basin
- PWI Wetland
- NWI Wetland
- City / Township Boundary
- Section Line

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4.5.7 Vegetation

This section describes vegetative resources within the Project Area and the potential impacts of the Project on those resources. Data from the DNR and the USFS ECS was used to determine the existing conditions of the Project Area.

4.5.7.1 EXISTING CONDITIONS

The Project Area is located within the Minnesota River Prairie Ecological Subsection which was once dominated by tallgrass prairie and maple, elm, and cottonwood forests. The dominant vegetation within the Project Area is corn and soybeans with small woodlots surrounding the adjacent home / farmsteads. According to NLCD land cover data, approximately 97 percent of the Project Area is classified as cultivated crops. Table 11 in Section 4.3.1 describes the land cover of the Project Area. There are no known native plant communities within the Project Area or within one mile of the Project Area as confirmed by the DNR Natural Heritage Information System ("NHIS") staff (Joyal email, Appendix F).

4.5.7.2 IMPACTS

Impacts to vegetation will almost entirely be to cultivated crops. Tree removal will be negligible as the small tree stands associated with homes / farmsteads are located adjacent to the Project Area and will not be impacted by the Project. During operation, the land beneath the arrays will be covered with low-growing, native groundcover vegetation which typically experiences less erosion than cultivated agricultural land.

4.5.7.3 MITIGATION

Marshall Solar will employ BMPs as outlined in the NPDES SWPPP for Construction as required by the MPCA. The SWPPP will include sediment and erosion control measures and re-vegetation/site stabilization plans. Additionally, Marshall Solar will use a native seed mixture to provide permanent groundcover after construction and during operation of the Project. Vegetative ground cover will be maintained with mowers and string trimmers.

4.5.8 Wildlife

This section describes wildlife resources within the Project Area and the potential impacts of the Project on those resources. Data from the DNR and the USGS Breeding Bird Survey ("BBS") was used to determine the existing conditions of the Project Area.

4.5.8.1 EXISTING CONDITIONS

Mammals

Wildlife in the Project Area consists primarily of species associated with agricultural landscapes. Common mammals found in Project Area habitats include raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), weasel (*Mustela sp*.), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), and rabbit (*Sylvilagus floridanus*). These species use the food and cover available from agricultural fields, grasslands, farm woodlots, and wetland areas. White-tailed deer, an economically important species, have a strong affinity for agricultural crops and use farm woodlots, wetlands, and stream bottoms for shelter.

Birds

Common birds in the vicinity of the Project Area include songbirds, waterfowl, and game birds such as pheasant. Migratory birds are those that may use the Project Area for resting, foraging, or breeding activities for only a portion of the year.

The Redwood Falls BBS Route is the nearest BBS Route and is located approximately 3.5 miles north of the Project Area and east of the city of Green Valley. This BBS Route lists 100 species. The most abundant bird observed was the common grackle (*Quiscalus quiscula*). Other abundant birds were the red-winged blackbird (*Agelaius phoeniceus*), mourning dove (*Zenaida macroura*), house sparrow (*Passer domesticus*), and the vesper sparrow (*Passerculus sandwichensis*).

Aquatic Species

The nearest waterbody is the Redwood River, located approximately one mile north of the Project Area. The two county drainage ditches within the Project Area may provide limited habitat to aquatic species, and potentially only seasonally.

4.5.8.2 IMPACTS

Impacts to wildlife during construction will be minimal as many of the species that use the Project Area can find similar habitat and foraging areas nearby. It may be possible that species (birds, mostly) attracted to low-growing groundcover may frequent the Project Area. Impacts to aquatic species will be negligible as Project infrastructure will avoid the drainage ditches and BMPs will be employed to mitigate soil erosion and runoff.

Early coordination with the DNR concluded that the Project Area consists of agricultural land that does not contain any high value wildlife habitat (Mixon letter, Appendix F).

4.5.8.3 MITIGATION

Mitigation measures are not proposed; however, at the recommendation of the DNR, an eight-foot-tall, chain-linked fence without barbed wire will be constructed around the Project to keep wildlife out of the Project Area. During operations and maintenance, site workers will survey areas during their inspection of watch duties and record any wildlife injuries or mortalities. This information is recorded on standardized forms and submitted to the corporate environmental scientists for tracking, analysis and reporting.

4.6 Rare and Unique Natural Resources

This section describes rare and unique natural resources within the Project Area and the potential impacts of the Project on those resources. Data from the DNR and the USFWS was used to determine the existing conditions of the Project Area.

4.6.1.1 EXISTING CONDITIONS

“Listed” species are recognized by federal, state, or other agencies in an effort to protect them or their habitat under the federal Endangered Species Act (1973) and the Minnesota Endangered Species Statute. These species are vulnerable to habitat loss or population decline because of their rarity.

The USFWS provides federally threatened and endangered species, as well as species proposed for listing (candidate), data at the county level for public use. Table 13 provides the federal and state list of species that may occur in Lyon County.

Table 13. Federal- and State-listed Species in Lyon County, Minnesota

Species	Federal Status	Likelihood of Occurrence
Federal Species		
Poweshiek skipperling Oarisma poweshiek	Proposed Endangered	Unlikely – no available prairie/grassland habitat.
Northern long-eared bat Myotis septentrionalis	Proposed Endangered	Possible if abandoned buildings are present near the Project Area. Also utilizes woodlots, shrubby fence lines and small copses.
State Species		
Burrowing owl *Athene cunicularia*	Endangered	Unlikely – no pasture and/or native grass prairie habitat.
Elktoe *Alasmidonta marginata*	Threatened	Unlikely – no available aquatic habitat.
Hair-like beak-rush *Rhynchospora capillacea*	Threatened	Unlikely – no fen (calcareous or otherwise) habitat. No wetlands present.
Henslow's sparrow *Ammodramus henslowii*	Endangered	Possible as agricultural fields are currently present; however, after construction agricultural fields will be converted to Project infrastructure. Agricultural areas adjacent to the Project Area may continue to support this habitat.
Loggerhead shrike *Lanius ludovicianus*	Threatened	Possible as agricultural fields are currently present; however, after construction agricultural fields will be converted to Project infrastructure. Agricultural areas adjacent to the Project Area may continue to support this habitat.

Source: USFWS. County Level Species Information 2015 & DNR NHIS 2014.

The DNR has determined that there are five state-listed threatened or endangered species for Lyon County. According to DNR NHIS GIS data and NHIS staff, three state-designated habitats or known occurrences of threatened, endangered, or special concern species occur within five miles of the Project Area.

An animal assemblage (colonial waterbird nesting area) occurs approximately two miles north of the Project Area, a vertebrate animal occurrence (northern grasshopper mouse [*Onychomys leucogaster*] – special concern) occurs approximately four miles north of the Project Area in Stanley Township, and an additional vertebrate animal occurrence (burrowing owl [*Athene cunicularia*] - endangered) occurs approximately two miles southeast of the Project Area in Clifton Township (Figure 4-9).

4.6.1.2 IMPACTS

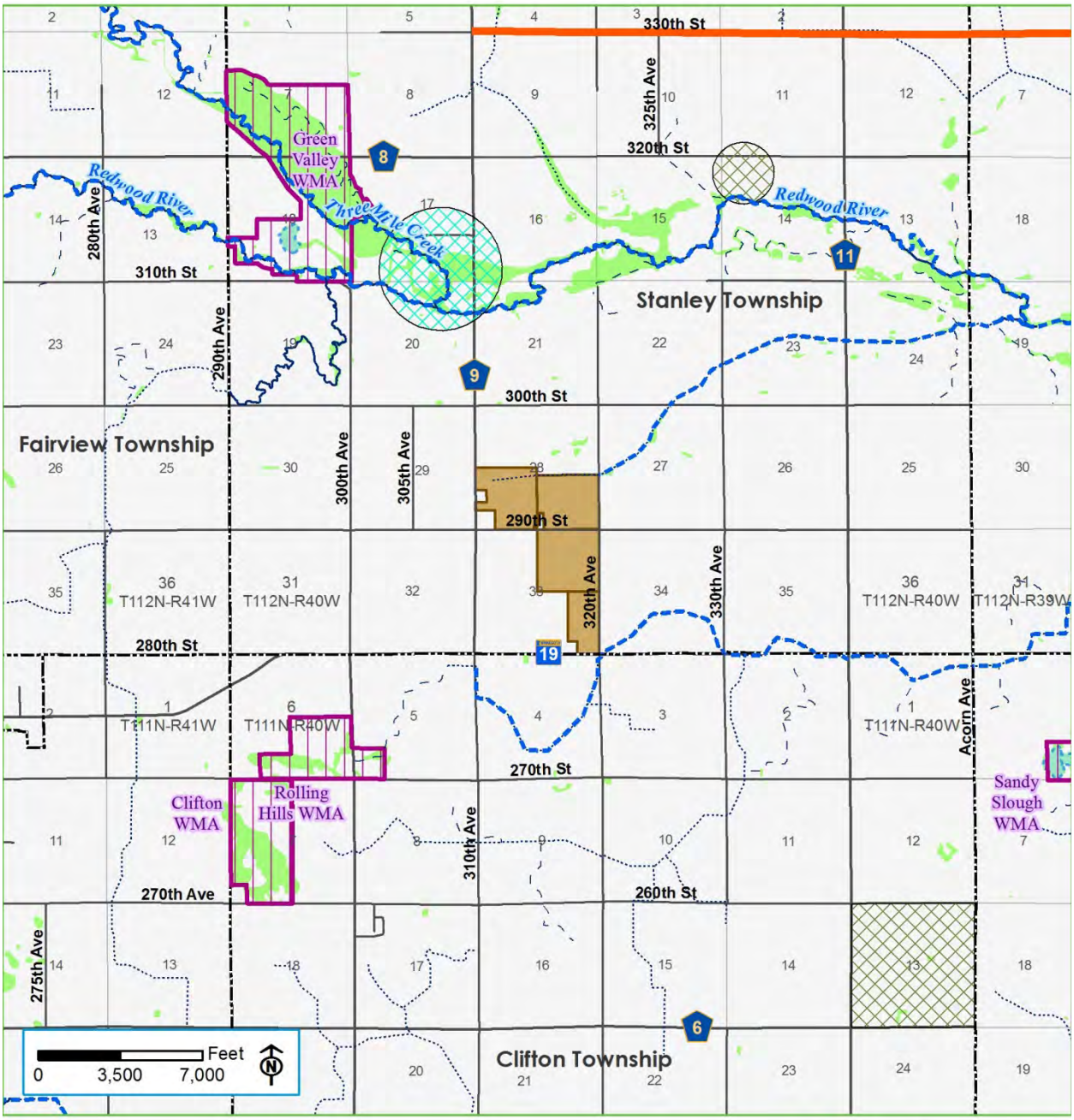
Impacts to rare and unique species are not expected because the probability of these species occurring on the site is unlikely. Early coordination with the DNR concluded that the Project Area consists of agricultural land that does not contain any high value wildlife habitat for federal and state-listed species (Mixon letter, Appendix F). DNR records indicate there are no occurrences of listed species within or near the Project Area.

4.6.1.3 MITIGTATION

Mitigation measures are not proposed; however, during operations and maintenance, site workers will survey areas during their inspection of watch duties and record any wildlife injuries or mortalities. This information is recorded on standardized forms and submitted to the corporate environmental scientists for tracking, analysis and reporting.

Marshall Solar Energy Project
Lyon County, Minnesota

Figure 4.9
NHIS Species Occurences



Legend

- Project Area
- Breeding Bird Survey Route
- PWI Stream
- Perennial River / Stream
- Intermittent River / Stream
- Drainage
- Wildlife Management Area
- Animal Assemblage (NHIS)
- Vertebrate Animal (NHIS)
- PWI Basin
- PWI Wetland
- NWI Wetland
- Township Boundary
- Section Line

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5 Public Outreach

Marshall Solar hosted one voluntary public open house meeting on January 14, 2015 to gather input from local stakeholders and the public about the Project. Marshall Solar also held numerous meetings with government agencies and individual landowners adjacent to the Project Area. Marshall Solar plans to continue proactive outreach efforts to keep the public informed of Project's development.

5.1 Open House Meeting

Marshall Solar hosted an open house meeting on January 14, 2015 to provide information to and gather feedback from local stakeholders and the public. Meeting attendees received a Project overview fact sheet and a blank comment form. Marshall Solar and NextEra corporate informational handouts were also available. Marshall Solar Energy Project Team members led attendees through a series of storyboards and attendees were encouraged to ask questions and discuss the information provided. A total of 69 people attended the meeting. Two attendees were from media sources: Marshall Independent Newspaper and Minnesota Public Radio News.

5.1.1 Meeting Materials

The materials made available at the January 14, 2015 open house included:

- Project Overview Fact Sheet
- Information Boards
    - Welcome
    - Who is NextEra?
    - Project Overview
    - How Photovoltaic Energy Works
    - Project Area
    - Visual Simulation #1
    - Visual Simulation #2
    - Visual Simulation #3
    - Construction Process
    - Community Involvement
    - Regulatory Process
    - Environmental Information
- Map of Project Area
- Comment Form
- NextEra Resource Material (not included in Appendix G).

Meeting materials can be found in Appendix G.

5.1.2 Comment Forms

To collect feedback during the open house, comment forms were made available with every fact sheet given to attendees. The comment form asked for contact information and provided a space for comments. Comment forms could be submitted during the open house or mailed to Marshall Solar after the meeting.

Marshall Solar provided an email address (info@marshallsolar.com or marshallsolarproject@gmail.com) to attendees to submit digital comments. Four comment forms were submitted during the open house and two comment forms were mailed to Marshall Solar. A total of six comments were received via email. In summary, a total of twelve comments were received by Marshall Solar at the time of this application filing. Table 14 below includes the major comment topics and where they are addressed in this Application.

5.2 Outreach

5.2.1 Meetings

In May 2014, the Marshall Solar Energy Project Team met with Lyon County zoning officials to discuss county-level permitting requirements. Additionally, Marshall Solar held a local government and stakeholder meeting in Marshall on December 11, 2014. Attendees included Lyon County Staff, local utilities, and Township members. The purpose of the meeting was to introduce NextEra and the Project to local regulators and gather feedback about the Project.

Marshall Solar also held a joint meeting with the Department of Commerce and the DNR in December 2014 to discuss the Project. A pre-application filing meeting was held with the Department of Commerce on February 25, 2015.

Marshall Solar has met with numerous landowners adjacent to the Project Area prior to submitting this Application. Additional coordination with adjacent landowners will occur as the Project progresses through the permitting process.

5.2.2 Mailings

Landowners within ½-mile of the Project Area and local government and agency stakeholders were sent an invitation to the open house (Appendix G) held on January 14, 2015. In total, 40 mailed invitations were sent to adjacent landowners and stakeholders. All mailings contained contact information and email addresses which recipients could contact for more information about the Project and the open house.

A Thank You postcard was sent to those that attended the open house meeting. The postcard contained contact information and notified attendees of upcoming outreach activities.

Stakeholders included federal, state, and county representatives, including representatives from the USACE, USFWS, MN Department of Commerce, MnDOT, DNR, MN Department Agriculture, SHPO, Lyon County Officials, Stanley Township, Lyon-Lincoln Electric Coop, and Marshall Municipal Utilities. A map of the Project Area was also included in each mailing.

5.2.3 Media

Marshall Solar ran a paid advertisement in the January 7th issue of the Marshall Independent Newspaper. The paid advertisement included the open house date, location, time and a Project map (Appendix G).

5.3 Comments

The following topics were common themes discussed during the open house meeting and via comments received by mail and email. The locations within this Application where some of these comments have been addressed can be found in Table 14. After receiving comments at the public open house meeting in January and also from numerous one-on-one discussions with adjacent landowners, Marshall Solar worked through adjustments to the equipment specifications and configuration of the Project to address some of these concerns. In other cases, members of the Project team provided additional information and discussion to address specific concerns from the public. This type of information sharing will continue into the future.

Table 14. Comment Topics Addressed in this Application

Comment Topics	Location in Document
Potential impact of the Project on surrounding property values	Marshall Solar is investigating a means to study potential impacts; however, conclusive data is not available.
Proximity of Project infrastructure to adjacent property boundaries	Figure 4-1 and see below.
Potential health effects of the Project, including noise and electromagnetic fields	Sections 4.2.1., 4.2.3
Timeframe of regulatory process	Section 1.3
Implication of the Commission's management of the permitting process vs. the local jurisdiction (Lyon County)	Section 4.3.1
What sort of groundcover would be used beneath the arrays	Section 4.5.7
Potential impacts to existing drain tile and ditch systems	Sections 4.3.2, 4.5.5
Potential impact to birds and other wildlife	Sections 4.5.8, 4.6
The decision to build the Project in the proposed location	Sections 2.1, 2.2
Stray voltage and potential effects on livestock	Section 4.2.1
Any potential impacts from adjacent farming operations (i.e., shutdown due to excessive dusting of arrays/potential impacts on generation from dust created by combining)	Sections 3.4.2, 4.5.3

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Appendix A – Preliminary Design Specifications

Appendix B – Visual Simulations

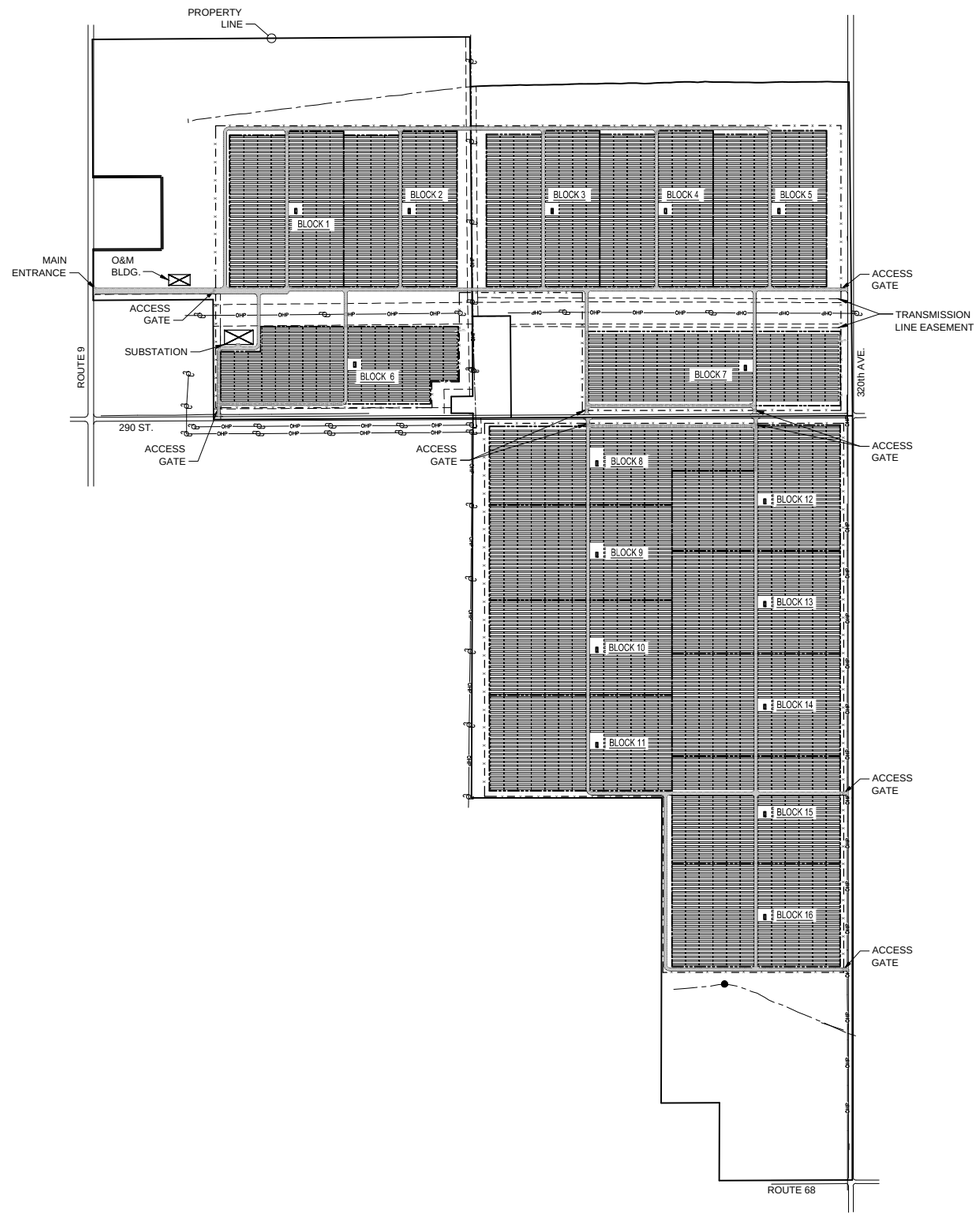
Appendix C – ALTA Survey

Appendix D – Cultural Resources Phase Ia Literature Search Memo

Appendix E– Wetland Delineation Technical Memo

Appendix F – Agency Letters

Appendix G – Public Outreach Materials



PROJECT SITE INFORMATION	
SYSTEM DESIGN VOLTAGE	1,500V
ASHRAE LOCATION	MARSHALL, MN
ASHRAE 0.2%	32°C
ASHRAE 0.4%	35°C
ASHRAE MINIMUM TEMP.	-27°C
DC OUTPUT	93.48 MW
AC OUTPUT	62.25 MW
AC INVERTER OUTPUT	64 MW
ARRAY GCR	50%
ARRAY GCR BLOCK 6 ONLY	53%
DC/AC RATIO	1.5
ACREAGE USED	311
SITE ACREAGE	500
FENCE LENGTH	~26,600 FEET
ACCESS ROAD LENGTH	~33,450 FEET
MODULES	TRINA TSM-PEG14
MODULE WATTAGE	325W
CELLS	72 MULTICRYSTALLINE
FRAME	FRAMELESS
INVERTER	GE 1500V 4MW
OVERDRIVE OPTION INCLUDED	NO
CEC EFFICIENCY	98%
INVERTER MAXIMUM VOLTAGE	1,500V
RATED MPPT RANGE	835-1275V
MAX. DC VOLTAGE	1,500V
MAX. CONT. DC CURRENT	5,000 A
MAX. CONT. DC CURRENT PER CABINET (X4)	1,250 A
MAX. POWER OUTPUT @ 50°C	4,000kVA
AC VOLTAGE	550V
NUMBER OF MPPT	1
NO. INVERTERS	16
RACKING	
CONFIGURATION	FIXED - 2 PORTRAIT
TILT	30° (NOT OPTIMIZED)
AZIMUTH	180°
PITCH	25 FEET
ARRAY SPECIFICATIONS	
PROJECT MODULE QUANTITY	287,616
ARRAY BLOCK MODULE QUANTITY	17,976
NO. OF ARRAY BLOCKS	16
STRING SIZE	28
NO. OF STRINGS IN A ARRAY BLOCK	642
TOTAL NO. OF STRINGS	10,272
ARRAY BLOCK STC DC RATING	5.8 MW
ARRAY MAXIMUM VOLTAGE	1,499 V
ARRAY RATED ISC	5,701 A
MAX. SHORT CIRCUIT CURRENT (ISC X 1.25)	7,126 A
RATED MAX. POWER POINT CURRENT	5,405 A

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

PORTRAIT LAYOUT - 2 ROWS OF 28 SOLAR MODULES

A SOLAR TABLE DETAIL
SCALE: N.T.S.

LEGEND

- OHP — OVER HEAD POWER LINE
- SOLAR BLOCK BOUNDARY
- FENCE
- ROAD
- INVERTER
- SOLAR TABLE (SEE DETAIL A)

NOTE

1. 16 FOOT MINIMUM DISTANCE FROM ALL RACKING TABLES TO PERIMETER FENCES.

PRELIMINARY
NOT FOR CONSTRUCTION

RRC POWER & ENERGY, LLC
87662 SW MOHAWK STREET
TUALATIN, OR 97062
PHONE: (503) 342-4064
www.RRCcompanies.com

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PREPARED FOR:

REV	DATE	ISSUE DESCRIPTION
E	02/04/2015	REVIEW
D	02/03/2015	REVIEW
C	01/29/2015	REVIEW
B	01/23/2015	REVIEW
A	01/16/2015	REVIEW

PROJECT MGR: S. MOSER
CHECKED BY: T. BAILEY
DESIGNED BY: J. MOFFIT
DRAWN BY: J. MOFFIT

SCALE: 1" = 500'-0"
0 — 2"
BAR MUST SCALE 2" FOR FULL SIZE OR 1" FOR HALF SIZE DRAWING

PROJECT NUMBER: M-150001

DRAWING NAME:
MARSHALL
SOLAR PROJECT
SITE PLAN

DATE ISSUED: 01/16/2014

DRAWING No.	SHEET:	REVISION
E-710-01	1 of 1	E

CADFILE: MSP-E-710-01

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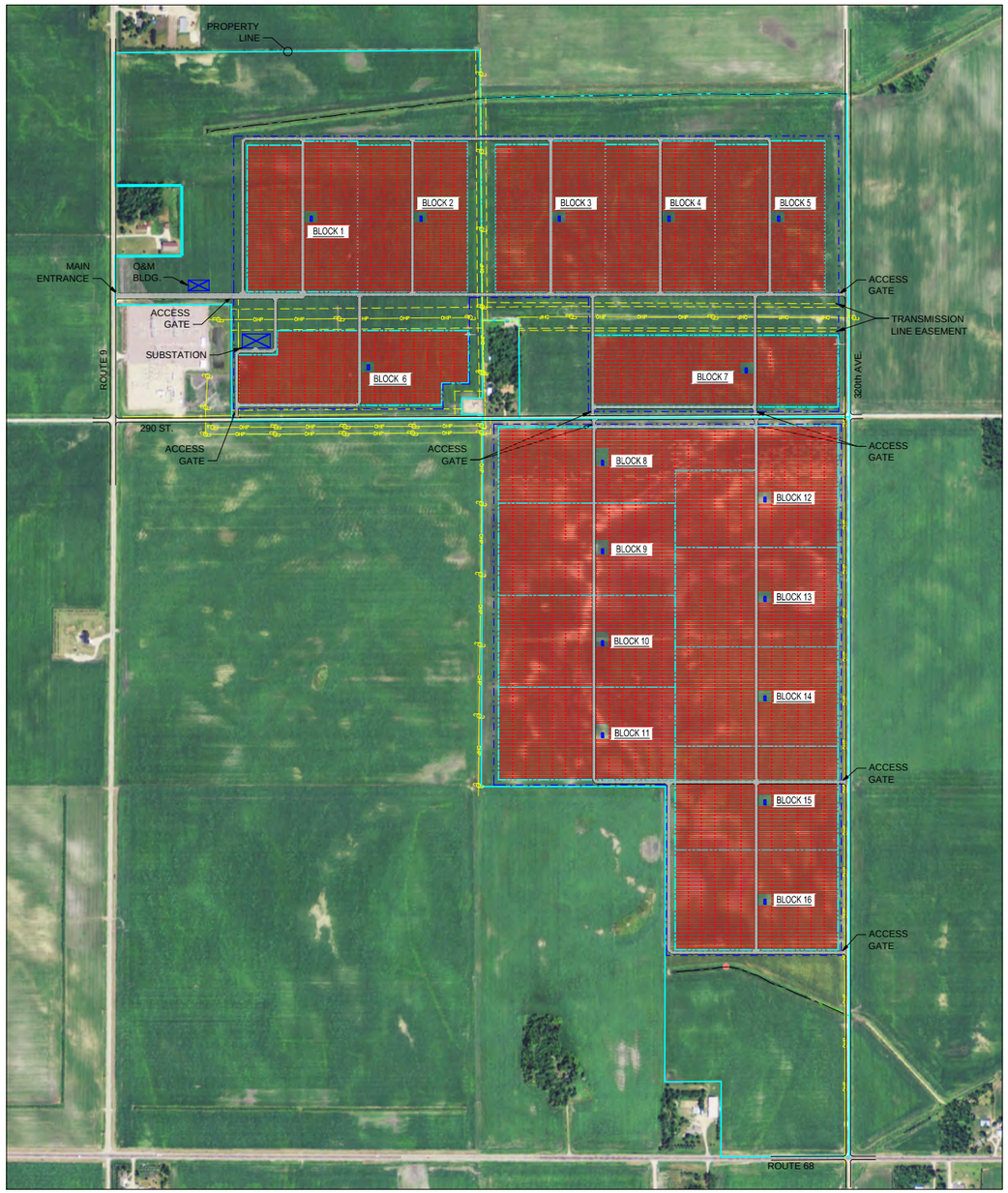

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		

PORTRAIT LAYOUT - 2 ROWS OF 28 SOLAR MODULES

A SOLAR TABLE DETAIL
SCALE: N.T.S.

LEGEND

- OHP — OVER HEAD POWER LINE
- SOLAR BLOCK BOUNDARY
- FENCE
- ROAD
- INVERTER
- SOLAR TABLE (SEE DETAIL A)

NOTE

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PREPARED FOR:

REV	DATE	ISSUE DESCRIPTION
E	02/04/2015	REVIEW
D	02/03/2015	REVIEW
C	01/29/2015	REVIEW
B	01/23/2015	REVIEW
A	01/16/2015	REVIEW

PROJECT MGR: S. MOSER
CHECKED BY: T. BAILEY
DESIGNED BY: J. MOFFIT
DRAWN BY: J. MOFFIT

SCALE: 1" = 500'-0"
0 — 2"
BAR MUST SCALE 2" FOR FULL SIZE OR 1" FOR HALF SIZE DRAWING

PROJECT NUMBER: M-150001

DRAWING NAME:
MARSHALL SOLAR PROJECT SITE PLAN

DATE ISSUED: 01/16/2014

DRAWING No. E-710-01 | SHEET: 1 of 1 | REVISION E

CADFILE: MSP-E-710-01

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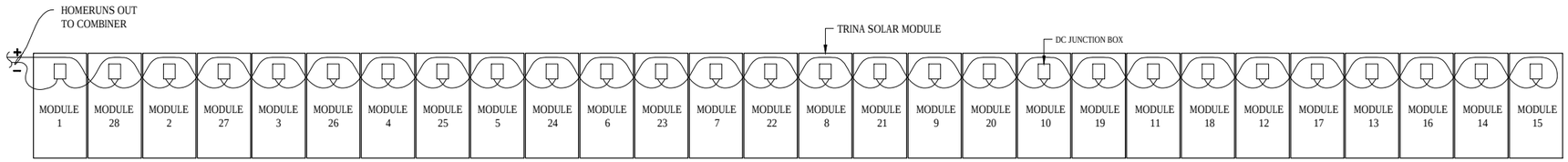
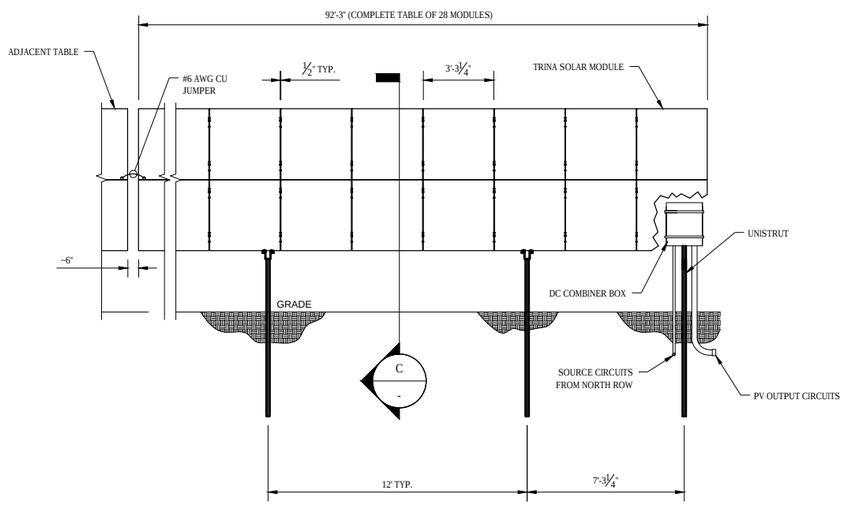


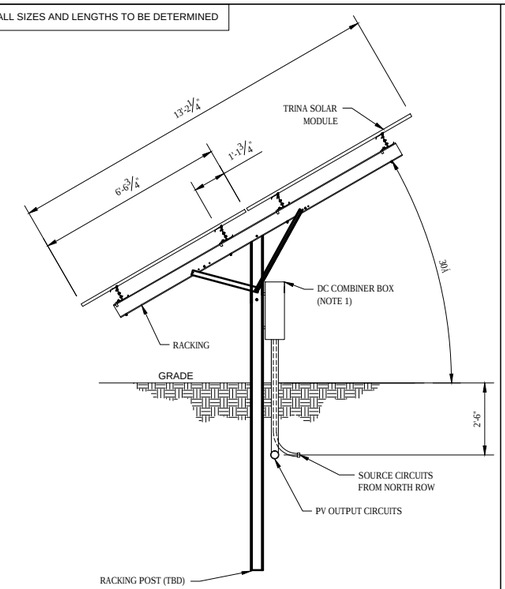
A SOLAR LEAP FROG WIRING
SCALE: N.T.S.

ALL SIZES AND LENGTHS TO BE DETERMINED



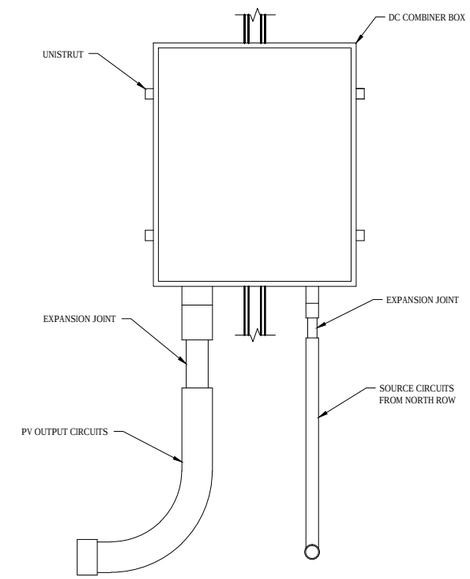
B SOLAR SOUTH ELEVATION VIEW
SCALE: N.T.S.

ALL SIZES AND LENGTHS TO BE DETERMINED

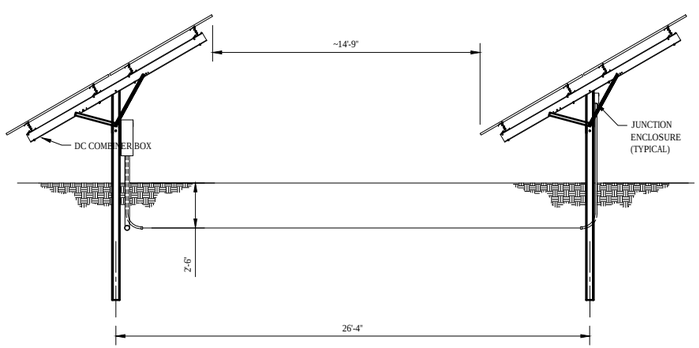


NOTE
1. RRC ASSUMES THAT THE COMBINER BOXES ARE MOUNTED TO THE SUPPORT TABLE PILES.

C SOLAR RACKING/MODULE EAST SECTION VIEW
SCALE: N.T.S.



D COMBINER BOX DETAIL
SCALE: N.T.S.



E SOLAR TABLE SPACING
SCALE: N.T.S.

PRELIMINARY
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PREPARED FOR:

REV	DATE	ISSUE DESCRIPTION
C	02/23/2015	REVIEW
B	02/10/2015	REVIEW
A	01/16/2015	REVIEW

PROJECT MGR: S. MOSER
CHECKED BY: T. BAILEY
DESIGNED BY: J. MOFFIT
DRAWN BY: J. MOFFIT

SCALE: N.T.S.
0 — 2"
BAR MUST SCALE 2" FOR FULL SIZE OR 1" FOR HALF SIZE DRAWING

PROJECT NUMBER: M-150001

DRAWING NAME:
MARSHALL
SOLAR PROJECT
PV TABLE
MOUNTING OPTIONS

DATE ISSUED: 01/16/2014

DRAWING No. E-711-01 | SHEET: 1 of 1 | REVISION C

CADFILE: MSP-E-711-01

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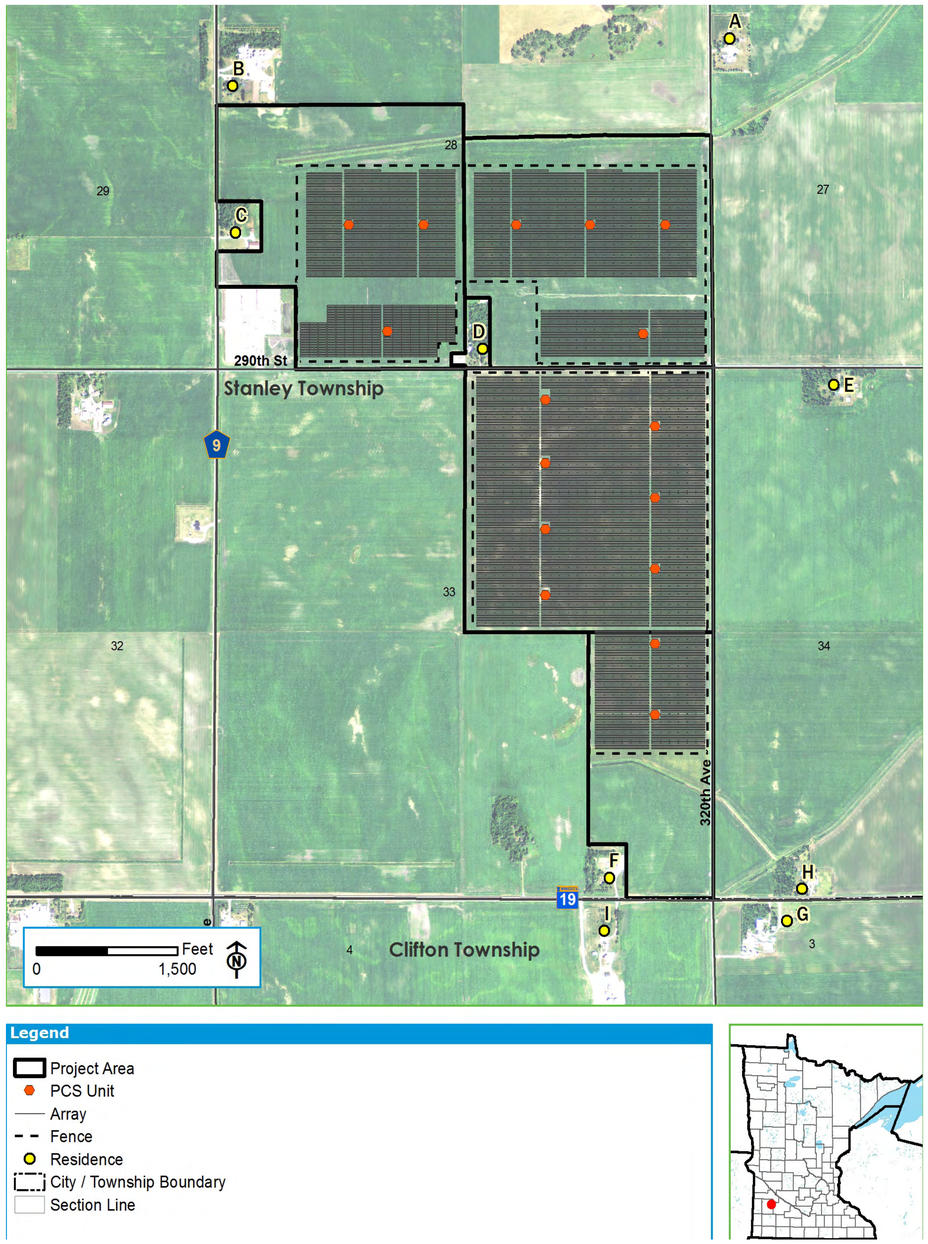
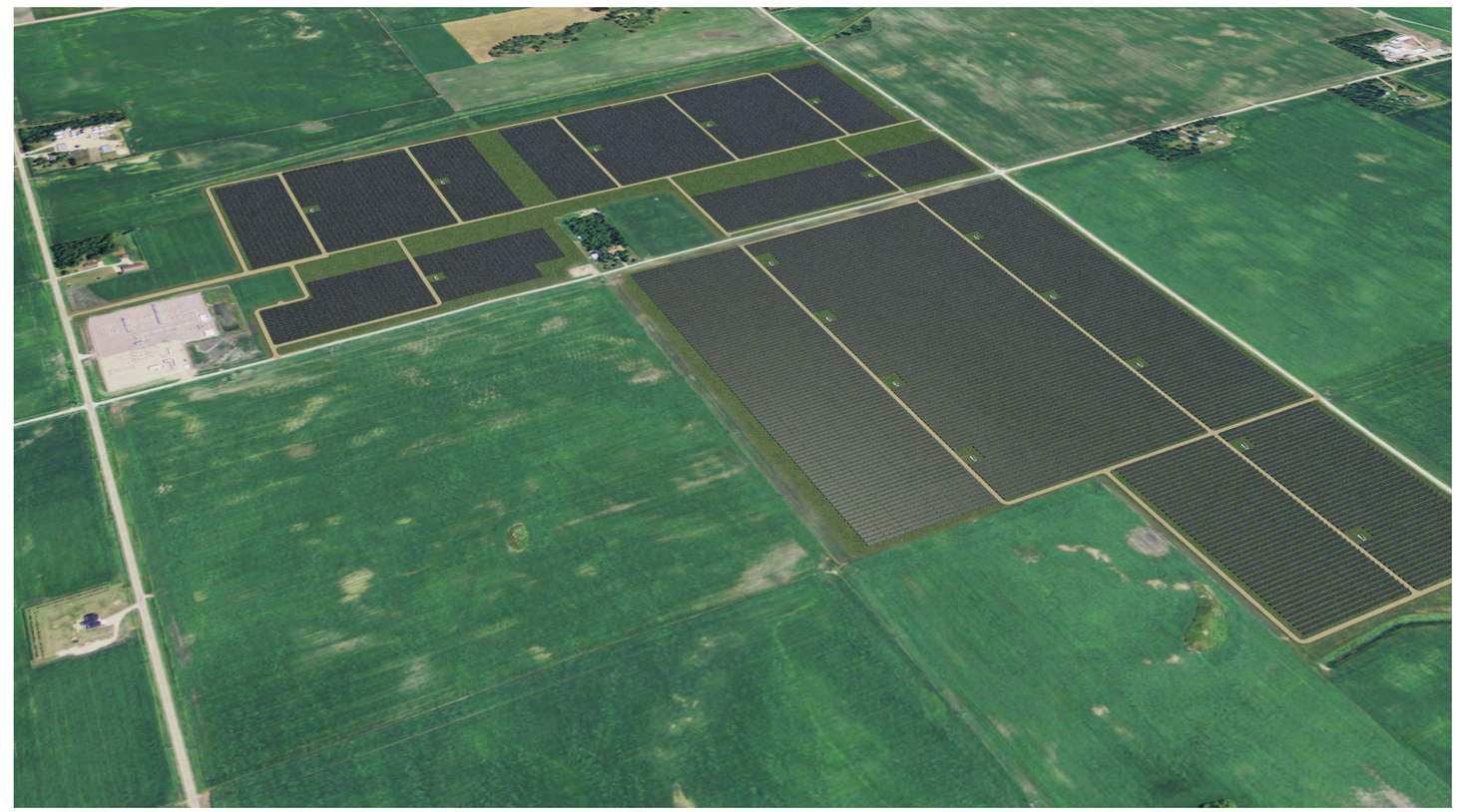
Project Area

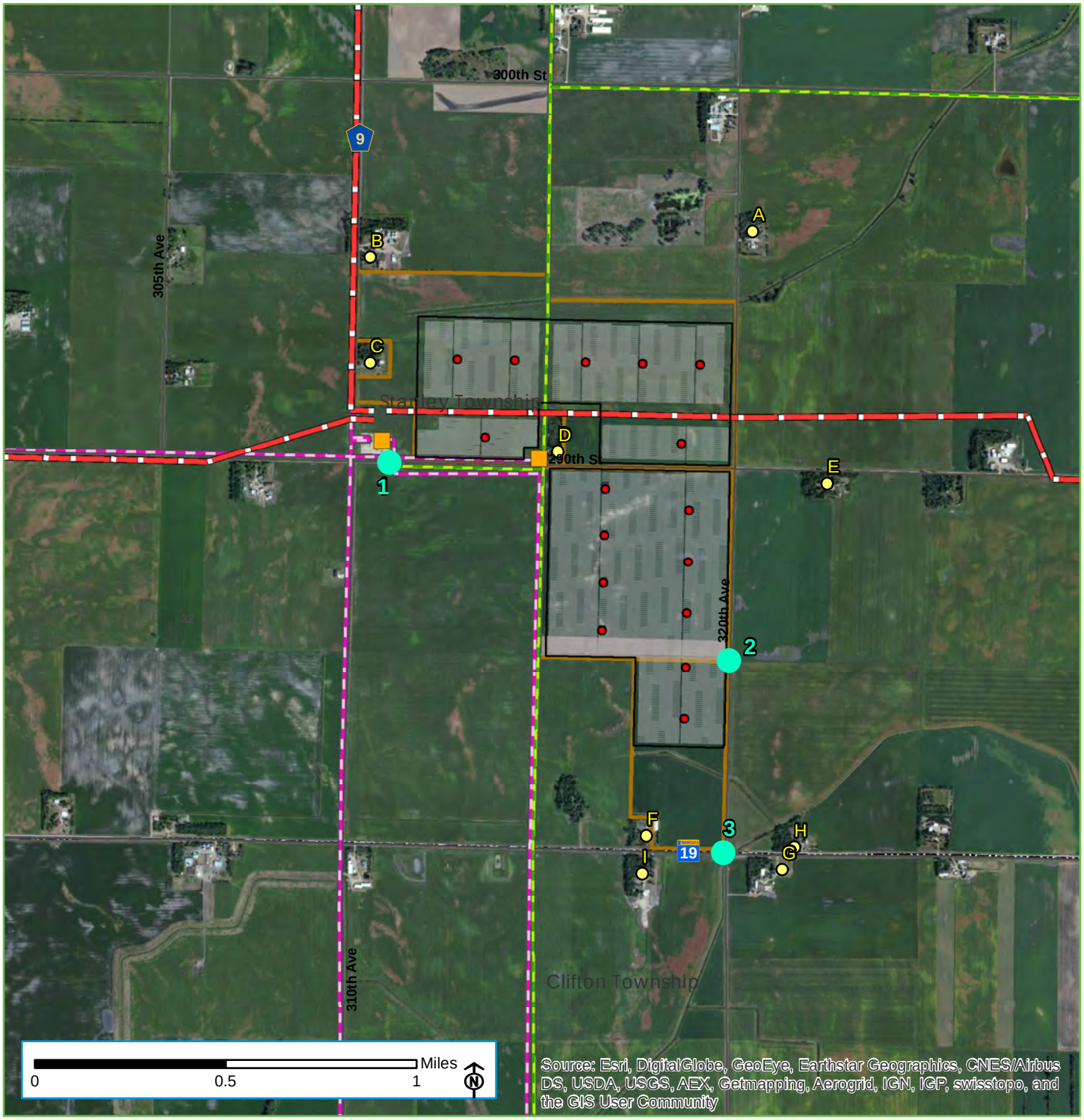


Current Aerial Photograph of
Project Location with Site Layout



Visual Simulation of Project Location
During Operation

Appendix B: Key Observation Points
Marshall Solar Energy Project



Legend

- Project Area
- **Existing Transmission Lines**
  - 69kV AC
  - 115kV AC
  - 345
- Lyon County and OTP Substations
- Visual Simulation Locations
- PCS Unit
- Fence
- Array
- Residence
- Township Boundary
- Section Line

Document Path: \\mspe-gis-file\GISProj\NextEra\241352_Marshall\map_docs\Visual Simulations\PhotoLocations_Letter_8x11.mxd

Photo Simulation #1

Looking East along 290th Street near County Highway 9

Current Conditions

Future Conditions

Photo Simulation #2

Looking West along 320th Avenue between 290th Street and State Highway 19

Current Conditions

Future Conditions

Photo Simulation #3

Looking North along 320th Avenue from State Highway 19

Current Conditions

Future Conditions

ALTA/ACSM LAND TITLE SURVEY

DESCRIPTION OF PROPERTY SURVEYED

(Per Exhibit A of First American Title company
Title Commitment No. NCS-677419-ONT1, dated September 21, 2014)

PARCEL 1:

That part of the Southeast Quarter [SE¼] of Section 28, Township 112, Range 40, in Lyon County, Minnesota, lying South of the centerline of Judicial Ditch No. 18; EXCEPTING THEREFROM the South 706 feet of the West 265 feet of the Southeast Quarter [SE¼] of said Section 28.

PARCEL 2:

The Southwest Quarter [SW¼] of Section 28, Township 112, Range 40, in Lyon County, Minnesota; EXCEPT all that part of the West Half of the Southwest Quarter [W½ of SW¼] of said Section 28 described as follows:

Beginning at a point on the west line of said Section 28, 959.5 feet South of the West Quarter Corner; thence at right angles to said section line and in an Easterly direction a distance of 475 feet; thence at right angles in a Southerly direction a distance of 497 feet; thence at right angles in a Westerly direction to the west line of said Section 28; thence North along the west line of Section 28 a distance of 497 feet, more or less, to the point of beginning;

ALSO EXCEPT the North 117 feet of the South 150 feet of the East 150 feet of said Southwest Quarter [SW¼] of Section 28, Township 112, Range 40, in Lyon County, Minnesota.

PARCEL 3:

The Northeast Quarter [NE¼] of Section 33, Township 112 North, Range 40 West, in Lyon County, Minnesota.

PARCEL 4:

The East Half of the Southeast Quarter (E 1/2 SE 1/4) of Section Thirty-three (33) in Township One Hundred Twelve (112) North of Range Forty (40) West of the Fifth Principal Meridian, excepting therefrom that tract described as follows:

Commencing at the Southwest corner of said East Half of the Southeast Quarter, thence North 90 degrees 00 minutes 00 seconds East, assumed bearing, along the South line of said Southeast Quarter, a distance of 404.00 feet; thence North 00 degrees 22 minutes 33 seconds East, parallel with the West line of said East Half of the Southeast Quarter, a distance of 540.00 feet; thence North 90 degrees 00 minutes 00 seconds West, parallel with said South line of said Southeast Quarter, a distance of 404.00 feet, to a point on the West line of the East Half of said Southeast Quarter; thence South 00 degrees 22 minutes 33 seconds West, along said West line, a distance of 540.00 feet; to the point of beginning.

"TABLE A" NOTES

1) Monuments have been placed at all major corners of the boundary of the property, unless already marked. ***As Shown On Survey***
2) There are no assigned addresses of subject property.
(PID# 18-028003-0 Parcel 1).
(PID# 18-028005-0 Parcel 2).
(PID# 18-033006-0 Parcel 3).
(PID# 18-033003-0 Parcel 4).
3) Per the FEMA Floodplain Maps for Stanley Township available on the Lyon County website, the subject property does not lie within a Flood Hazard Area.
4) Gross land area of subject property as follows:
Parcel 1 = 5,912,350 Sq.Ft. or 135.73 Acres.
Parcel 2 = 6,006,301 Sq.Ft. or 137.89 Acres.
Parcel 3 = 6,987,178 Sq.Ft. or 160.40 Acres.
Parcel 4 = 3,303,283 Sq.Ft. or 75.83 Acres.
Total = 22,209,112 Sq.Ft or 509.85 Acres
5) Contour interval = 1 foot. ***See Datums Note***
6) Property is zoned Agricultural per the Lyon County Zoning Map dated 2012.
7) There are no buildings on subject property.
8) Substantial features have been shown hereon.
11b) Location of utilities via observed evidence that are existing on or serving the surveyed property are shown hereon. ***See Survey Note #6***
13) Names of adjoining owners of platted lands according to current public records. ***As Shown On Survey.***
15) Rectified orthophotography, photogrammetric mapping, airborne/mobile laser scanning and other similar products, tools or technologies as the basis for the showing the location of certain features (excluding boundaries) where ground measurements are not otherwise necessary to locate those features to an appropriate and acceptable accuracy relative to a nearby boundary. The surveyor shall (a) discuss the ramifications of such methodologies (e.g. the potential precision and completeness of the data gathered thereby) with the insurer, lender and client prior to the performance of the survey and, (b) place a note on the face of the survey explaining the source, date, precision and other relevant qualifications of any such data.
16) There is no evidence of current earth moving work, building construction of building additions at the time of this survey.
18) There is no evidence of the subject property being used as a solid waste dump, sump or sanitary landfill.

BASIS OF BEARINGS

For the purposes of this survey the East line of Section 28, Township 112 North, Range 40 West, 5th Principal Meridian, is assumed to have a bearing of S0°34'30"E.

Datums:

Horizontal: Lyon County Coordinate System, NAD83 (1996 Adj), Lambert Conformal Conic, Minnesota. 5th Principal Meridian. Ground distances.

Vertical: NAVD88

Geoid: Geoid12a Conus

DATUMS

Initial site control established by MnDOT GNSS CORS Network on 10/17/2014.

Station: Stanley	Northing:	198252.258
	Easting:	550855.594
	Height:	1108.223 Feet
Station: Clifton	Northing:	195830.194
	Easting:	550857.253
	Height:	1107.524 Feet

SURVEY NOTES

1) Fee Simple ownership is vested in Joel Deutz, Brad Deutz, Thomas Deutz, Bradley Deutz and Joel Deutz, on commitment date.
2) Initial field work was completed on 10/18/2014.
3) The electrical transmission line shown on Survey on the north portion of Parcel 3, does not appear to have the benefit of an easement.
4) Subject to easements and restrictions of record, if any.
5) All distances shown hereon are in U.S. Survey feet and tenths or hundredths of a U.S. Survey foot. Angular units are shown in degrees (°), minutes (') and seconds (").
6) We searched for buried structures and utilities on and/or serving the site to the best of our ability, subject to the following restrictions:

A. Utility operations do not consistently respond to locate requests through the Gopher State One Call service for boundary purposes such as this.
B. Those utility operators that do respond, often will not locate services from their main line to the customer's structure or facility - they consider those segments private installations that are outside their jurisdiction. If a private service to an adjoiner's side crosses this site or a service to this site crosses an adjoiner, it may not be located since most operators will not mark such private services.
C. Snow and ice conditions during winter months may obscure otherwise visible evidence of a buried structure or utility.
D. Maps provided by operators, either along with a field location or in lieu of such a location, are very often inaccurate or inconclusive.
E. EXTREME CAUTION MUST BE EXERCISED BEFORE AN EXCAVATION TAKES PLACE ON OR NEAR THIS SITE. BEFORE DIGGING, YOU ARE REQUIRED BY LAW TO NOTIFY GOPHER STATE ONE CALL AT LEAST 48 HOURS IN ADVANCE AT (651) 454-0002.
F. Per Gopher State One-Call Ticket No. 143032062, the following utilities and municipalities were notified:

LNPSTW01	LINCOLN-PIPESTONE WATER	(507) 368-4248
LYLNEC01	LYON LINCOLN ELECTRIC	(507) 247-5505
OTTERT04	OTTER TAIL POWER	(320) 589-3434
CTLMN01	CENTURYLINK	(800) 283-4237

7) EXCEPTIONS-Items pertaining to Schedule B-Section II of Commitment to Title from First American Title Company National Commercial Services Commitment No. NCS-677419-ONT1, dated September 21, 2013:

Item 16 - Easement for electric transmission line purposes, together with any incidental rights, in favor of Northern States Power Company, a Minnesota corporation d/b/a Xcel Energy, as contained in the Easement, dated July 3, 2002, recorded August 22, 2002 as Document No. 140996. [Parcel 1 and Parcel 2]. ***Shown on Survey.***

Item 17 - Easement for electric transmission line purposes, together with any incidental rights, in favor of Great River Energy, a Minnesota cooperative corporation, as contained in the Easement, dated January 6, 2009, recorded January 20, 2009 as Document No. 179612. [Parcel 1]. ***Shown on Survey.***

Item 18 - Easement for electric transmission line purposes, together with any incidental rights, in favor of Great River Energy, a Minnesota cooperative corporation, Northern States Power Company, a Minnesota corporation d/b/a Xcel Energy, Western Minnesota Municipal Power Agency, a Minnesota municipal corporation and political subdivision, Otter Tail Power Company, a Minnesota Corporation, and Central Minnesota Municipal Power Agency, a Minnesota municipal power agency, as tenants in common, as contained in the Electric Line Easement, dated July 1, 2012, recorded July 16, 2012 as Document No. 195862. [Parcel 1]. ***Shown on Survey.***

Item 19 - Easement for electric transmission line purposes, together with any incidental rights, in favor of Lyon-Lincoln Electric Cooperative, Inc., a Minnesota cooperative corporation, as contained in the Easement, dated May 1, 2013, recorded July 26, 2013 as Document No. 200149. [Parcel 1]. ***Shown on Survey.***

Item 20 - Terms and conditions of the Conditional Use Permit, dated November 20, 2001, recorded December 5, 2001 as Document No. 136439. [Parcel 1, Parcel 2 and Parcel 4]. ***No survey related information to plot on Survey.***

Item 21 - Easement for electric transmission line purposes, together with any incidental rights, in favor of Great River Energy, a Minnesota cooperative corporation, as contained in the Easement, dated January 6, 2009, recorded January 20, 2009 as Document No. 179614. [Parcel 2]. ***Shown on Survey.***

Item 22 - Easement for electric transmission line purposes, together with any incidental rights, in favor of Great River Energy, a Minnesota cooperative corporation, Northern States Power Company, a Minnesota corporation d/b/a Xcel Energy, Western Minnesota Municipal Power Agency, a Minnesota municipal corporation and political subdivision, Otter Tail Power Company, a Minnesota Corporation, and Central Minnesota Municipal Power Agency, a Minnesota municipal power agency, as tenants in common, as contained in the Electric Line Easement, dated July 1, 2012, recorded July 16, 2012 as Document No. 195863. [Parcel 2]. ***Shown on Survey.***

Item 23 - Easement for electric transmission line purposes, together with any incidental rights, in favor of Great River Energy, a Minnesota cooperative corporation, as contained in the Easement, dated January 6, 2009, recorded January 20, 2009 as Document No. 179613. [Parcel 3]. ***Shown on Survey.***

Item 24 - Terms and conditions of the exclusive right and option to purchase the Land as contained in the Memorandum of Real Estate Purchase Option Agreement by and between Brad Deutz and Rachel Deutz, husband and wife, Joel Deutz and Kelly Deutz, husband and wife, Thomas Deutz and Glenda Deutz, husband and wife, and Bradley Deutz and Joel Deutz as Trustees of the Family Trust created under the Last Will and Testament of John Deutz, Collectively the Seller, and Boulevard Associates, LLC, a Delaware limited liability company, Purchaser, dated April 15, 2014, recorded April 24, 2014, as Document No. 202813 [Part of Parcel 2]. ***No survey related information to plot on Survey.***

Item 25 - Terms and conditions of the exclusive right and option to purchase the Land as contained in the Memorandum of Real Estate Purchase Option Agreement by and between Brad Deutz and Rachel Deutz, husband and wife, Joel Deutz and Kelly Deutz, husband and wife, Thomas Deutz and Glenda Deutz, husband and wife, and Bradley Deutz and Joel Deutz as Trustees of the Family Trust created under the Last Will and Testament of John Deutz, Collectively the Seller, and Boulevard Associates, LLC, a Delaware limited liability company, Purchaser, dated April 15, 2014, recorded August 7, 2014, as Document No. 203729 [Part of Parcel 2]. ***No survey related information to plot on Survey.***

Item 26 - Terms and conditions of the exclusive right and option to purchase the Land as contained in the Memorandum of Real Estate Purchase Option Agreement by and between Brad Deutz, also known as Bradley J. Deutz, and Rachel Deutz, husband and wife, Joel Deutz, also known as Joel Deutz, and Kelly Deutz, husband and wife, Thomas Deutz and Glenda Deutz, husband and wife, Collectively the Seller, and Boulevard Associates, LLC, a Delaware limited liability company, Purchaser, dated February 3, 2014, recorded March 13, 2014 as Document No. 202426. [Parcel 3]. ***No survey related information to plot on Survey.***

Item 27 - Assignment and Assumption of Easements dated February 7, 2001, recorded May 9, 2001, as Document No. 132655, by and between Xcel Energy Inc., a Minnesota corporation, and Northern States Power Company, a Minnesota corporation, formerly known as Northern Power Corporation.

Supplemental Trust Indenture dated July 1, 2005, recorded July 18, 2005, as Document No. 160946, from Northern States Power Company, a Minnesota corporation, to BNY Midwest Trust Company, encumbering the above easements. [Parcel 4]. ***No easements defined to plot on Survey.***

Item 28 - Easement for underground water line purposes, together with any incidental rights, in favor of Lincoln Pipestone Rural Water System, a Minnesota body politic, as contained in the Right-Of-Way Easement Agreement dated November 13, 2002, recorded March 30, 2005, as Document No. 159109. [Parcel 4]. ***Shown on Survey.***

SURVEYOR'S CERTIFICATION

To NextEra Energy Resources, LLC, Joel Deutz, Brad Deutz, Thomas Deutz, Bradley Deutz and Joel Deutz and First American Title Company National Commercial Services:

This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2011 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys, jointly established and adopted by ALTA and NSPS and includes Items 1, 2, 3, 4, 5, 6, 7(a), 8, 11(b), 13, 15, 16 and 18, of Table A thereof. The field work was completed on October 18th, 2014.

Date of Map: November 7th, 2014

Michael R. Williams, PLS
MN Registration No. 44076
EVS Incorporated
10025 Valley View Road, Suite 140
Eden Prairie, MN 55344
(952) 646-0236

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EVS, INC.
10025 Valley View Road, Suite 140
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Phone: 952-646-0236
Fax: 952-646-0290
www.evs-eng.com

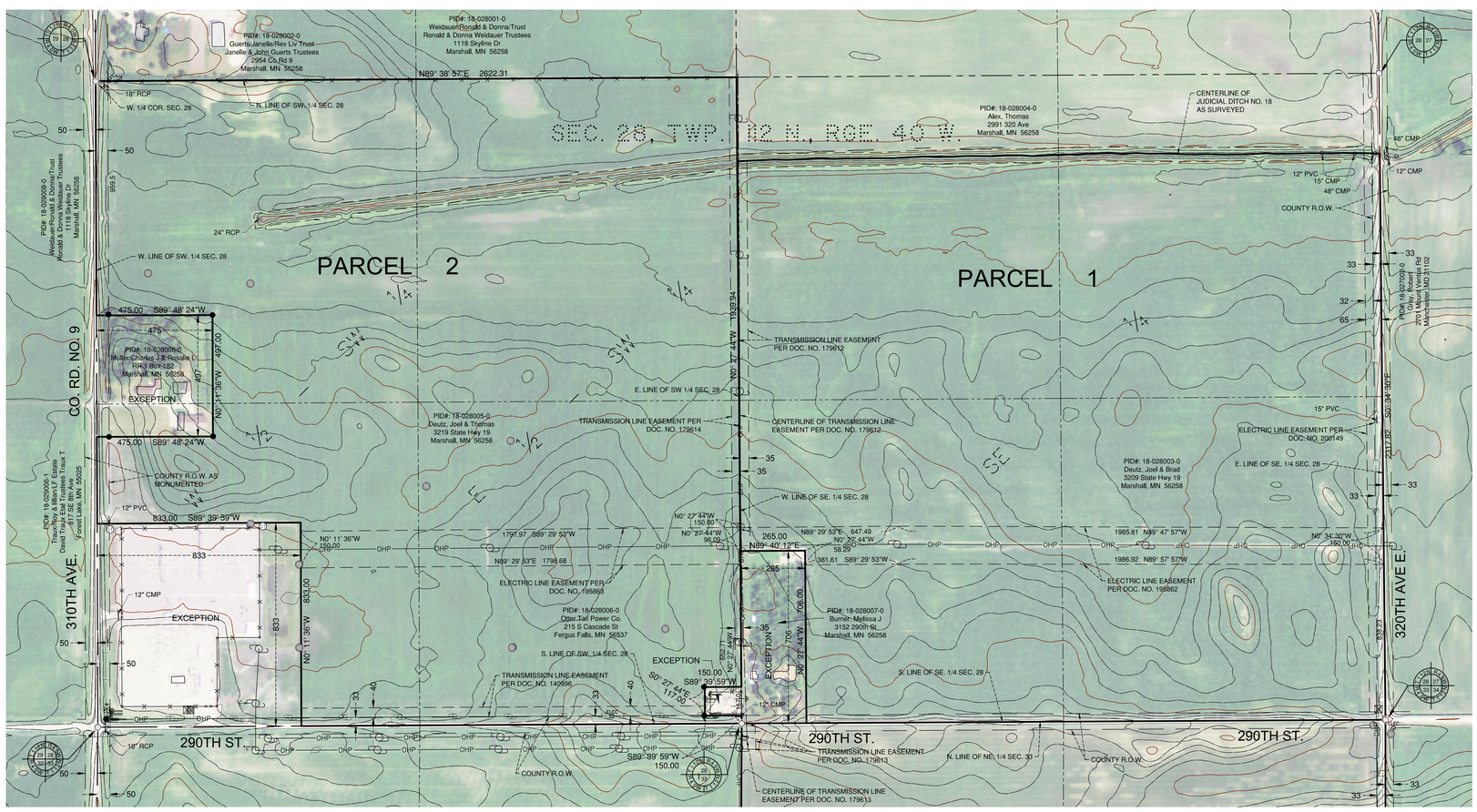
CLIENT
NextEra Energy Resources, LLC

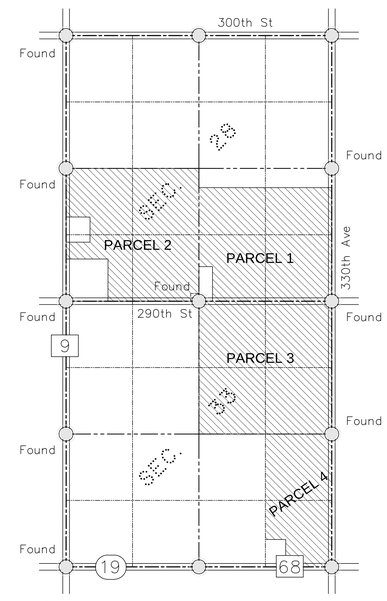
LOCATION
Lyon County, MN

SHEET
ALTA/ACSM Land Title Survey

N

GRAPHIC SCALE
200 0 100 200 400
(IN FEET)
1 inch = 200 feet.





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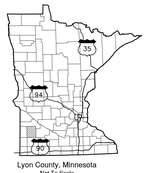

Lyon County, Minnesota
Not To Scale

LEGEND

STATION MARK
FOUND CIM
FOUND IP
SET IP
STORM MH
AREA DRAIN
CURB INLET
F.E.S.
STORM MH
AREA DRAIN/TILE INLET
TELEPHONE PEDESTAL
ELECTRIC PEDESTAL
ELECTRIC METER
TRANSFORMER
UTILITY POLE
GUY WIRE
WATER VALVE
STORM SEWER
TELEPHONE
ELECTRIC
OVERHEAD POWER
UNDERGROUND POWER
WATER
GAS
FENCE
FENCE
FENCE

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#	DATE	REVISION
.		

I HEREBY CERTIFY THAT THIS PLAN OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

MICHAEL R. WILLIAMS
DATE 11/06/2014
REGISTRATION NUMBER 44076

DRAWN BY	CHECKED BY
LCC	MRW
DATE	PROJECT #
11.07.2014	2014-063.2

SHEET NUMBER
1 OF 2

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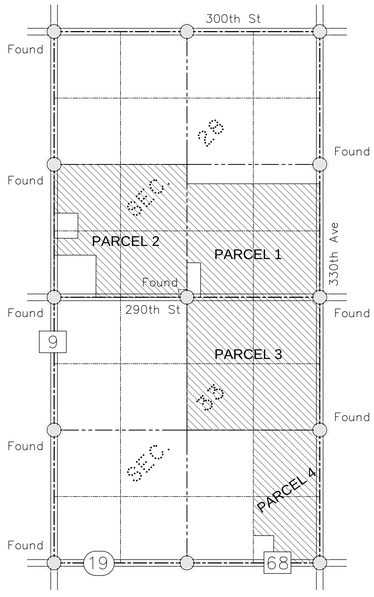
ALTA/ACSM LAND TITLE SURVEY



Sec. 28 & 33, Twp. 112 N., Rge. 40 W.
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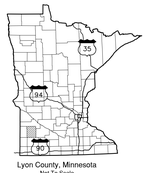

Lyon County, Minnesota
Not To Scale

LEGEND

- STATION MARK
- FOUND CIM
- FOUND IP
- SET IP
- STORM MH
- AREA DRAIN
- CURB INLET
- F.E.S.
- STORM MH
- AREA DRAIN/TILE INLET
- TELEPHONE PEDESTAL
- ELECTRIC PEDESTAL
- ELECTRIC METER
- TRANSFORMER
- UTILITY POLE
- GUY WIRE
- WATER VALVE
- STORM SEWER
- TELEPHONE
- ELECTRIC
- OVERHEAD POWER
- UNDERGROUND POWER
- WATER
- GAS
- FENCE
- FENCE
- FENCE

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1 inch = 200 feet.

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MICHAEL R. WILLIAMS
DATE 11/06/2014
REGISTRATION NUMBER 44076

DRAWN BY	CHECKED BY
LCC	MRW
DATE	PROJECT #
11.07.2014	2014-063.2

SHEET NUMBER
2 OF 2

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Phase Ia Cultural Resources Literature Search - Technical Memo

Date:	Tuesday, January 20, 2015
Project:	NextEra Marshall Solar Project
To:	Brandon Stankiewicz & Jenny Field, NextEra Energy Resources
From:	Mike Justin, HDR Engineering, Inc.
Subject:	Phase Ia Cultural Resources Literature Search

This memorandum presents the results of a Phase Ia cultural resources literature search ("Phase Ia") completed for the Marshall Solar Project ("Project") in Lyon County, Minnesota. Archaeologists at HDR were asked to conduct a Phase Ia for the Project and provide recommendations for future Project-specific cultural resource identification activities. HDR understands that the Project is in preliminary planning stages and that there currently is no federal agency responsible for compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implementation of regulations found at 36 CFR 800. Because the Project's formal area of potential effects ("APE") has not been designated at this time, HDR has defined a Project Area that will likely encompass the APE once it is developed.

HDR staff conducted background research at the Minnesota State Historic Preservation Office ("SHPO") and the Minnesota Historical Society ("MHS") in November 2014. Research gathered at SHPO encompassed previous cultural resource surveys, previously identified archaeological sites, and previously identified historic properties. Historic plat maps of the study area were consulted at MHS. Public Land Survey maps from the 19th century were examined online at http://www.gis.state.mn.us/GLO/Index.htm.

Project Overview

Marshall Solar, LLC ("Marshall Solar"), a wholly owned subsidiary of NextEra Energy Resources, LLC ("NextEra") is currently developing the Marshall Solar Energy Project ("Project"), a 62.25 MW solar photovoltaic facility located in Lyon County, Minnesota. The Project's output will be delivered to NSP, an Xcel Energy subsidiary under a long-term PPA. The Project would interconnect to the Minnesota electrical system at 115 kilovolts ("kV") at the Lyon County Substation, which is located adjacent to the Project Area.

Size and Location

The Project is located on approximately 510 acres of privately owned land in Lyon County, approximately four miles east of the city of Marshall. Marshall Solar has entered into Purchase Option Agreements with the landowner and Marshall Solar would own the property prior to the start of construction. Major roadways in the area include County Highway 9 and County Highway 11, and State Highway 19. The Project Area is bisected by 290th Street and lies between State Highway 19 and 320th Avenue. All Project components are located within

Township 112 North, Range 40 West, Sections 28 and 33 of the 5th Principal Meridian (Figure 1).

Proposed Facilities and Energy Conversion Process

The Marshall Solar Project will include the following major components or systems:

- Solar Panel Arrays, Panels, and Support Structures
- Electrical Collection System
- Step-up Transformation/Utility Interconnection
- Access Roads
- O&M Building
- Perimeter Fencing

General Background

Environmental Setting

The Project is sited within the Blue Earth Till Plain physiographic area (Wright, 1972), and is mapped as ground moraine associated with the Des Moines Lobe of the Late Wisconsinan glaciation (Hobbs, H.C.;Goebel, J.E. ,1982). Before Euro-American settlement, the vegetation in the Project Area consisted of tallgrass prairie. Wildlife within the region that would have been available for exploitation in precontact times includes bison (*Bison bison*), elk (*Cervus Canadensis*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), skunk (*Mephitis mephitis*), weasel (*Mustela sp*.), coyote (*Canis latrans*), rabbit (*Sylvilagus floridanus*), fox (*Vulpes vulpes*), badgers (*Taxidea taxus*), and avian species such as the Greater Prairie Chicken (*Tympanuchus cupido*).

The Project Area is approximately one mile south of the Redwood River and is drained by the Redwood Watershed, with waters eventually flowing into the Minnesota River. In presettlement times, there were pockets of wetland prairies scattered throughout the region. Currently, much of the area has been drained by a judicial ditch system to increase arable land. Agricultural tillage of corn and soybeans predominate the Project Area, with a few patches of hay field or grazing land.

The SSURGO Database for Lyon County indicates the soils on the site as listed in Table 1, along with the hydric status of each mapped soil. The National Wetlands Inventory ("NWI") did not indicate any mapped wetlands within the proposed Project Area (Figure 2). U.S. Geological Survey ("USGS") digital mapping (USGS 1962) indicated the presence of two unnamed streams located within the Project Area draining into a mapped Minnesota Department of Natural Resources ("DNR") Public Waterways named feature to the northeast, and Clear Creek to the southeast. HDR confirmed these to be excavated perennial drainage ditches.

Table 1. Project Area Soils

Map Unit Symbol	Soil Map Unit Name	Hydric Category

86	Canisteo clay loam	Hydric
127	Sverdrup sandy loam, 0 to 2 percent slopes	Nonhydric
127B	Sverdrup sandy loam, 2 to 6 percent slopes	Nonhydric
246	Marysland loam	Hydric
276	Oldham silty clay loam	Hydric
339	Fordville loam, 0 to 2 percent slopes	Nonhydric
339B	Fordville loam, 2 to 6 percent slopes	Nonhydric
341	Arvilla sandy loam, 0 to 2 percent slopes	Nonhydric
341B	Arvilla sandy loam, 2 to 6 percent slopes	Nonhydric
341C	Arvilla sandy loam, 6 to 12 percent slopes	Nonhydric
421B	Ves loam, 1 to 4 percent slopes	Predominantly Nonhydric
421B2	Ves loam, 3 to 6 percent slops, eroded	Nonhydric
423	Seaforth loam, 1 to 3 percent slopes	Predominantly Nonhydric
953C	Arvilla-Storden-Ves complex, 6 to 15 percent slopes	Nonhydric
954C2	Storden-Ves loams, 5 to 12 percent slopes, eroded	Predominantly Nonhydric
1029	Pits, gravel	Nonhydric
L84A	Glencoe clay loam, depressional, 0 to 1 percent slopes	Hydric

Cultural Contexts

The following summaries of cultural contexts relevant to the Project Area are based partially on information contained in a series of statewide historic contexts developed by the Minnesota SHPO (Dobbs 1990a, Dobbs 1990b, SHPO 1993), and an overview entitled “Minnesota’s Environment and Native American Culture History” by Gibbon, Johnson, and Hobbs (2002).

Paleoindian Tradition (9500 - 6000 B.C.)

The earliest human inhabitants of Minnesota entered the area about 11,000 years ago as the glacial front receded out of Minnesota. These peoples, comprising the Paleoindian Tradition, are believed to have been migratory groups of hunter-gatherers that followed herds of large game animals such as bison, woodland caribou, and mastodon into the tundra and open pine and oak forests that characterized Minnesota as the glaciers retreated. There is little archeological evidence of Paleoindian inhabitants in Minnesota, as they did not generate large artifact deposits. Also, cultural materials left by these people are often deeply buried underneath more recent sediment making them more difficult to find. Archaeological evidence from this period consists mainly of isolated discoveries of large and distinct projectile points that are characteristic of this tradition. These points are divided into the Fluted Point Pattern (Clovis and Folsom points) and the non-fluted Lanceolate Point Pattern (Plano). Other tool types associated with the Paleoindian tradition include bifacially flaked knives, simple choppers, and large scrapers for processing kills.

Archaic Tradition (6000 - 500 B.C.)
As Minnesota became warmer and drier, expanses of prairie began to displace the previous forested land. The melting ice exposed new land surfaces with extensive lakes and large, swift rivers fed by the glacial run-off, and quite unlike any in present-day Minnesota.

As the Pleistocene megafauna died out, the human inhabitants adapted to the altered landscape by developing new tool types and means of subsistence associated with the Archaic Tradition. The Archaic Tradition is distinguished from the Paleoindian period by an increased diversity in tool types, the raw materials they were made from, and the exploitation of a larger variety of animal and plant communities. This diversity has been attributed to the adaptation of Archaic peoples to local resources and a relative abundance of animal and plant resources. The archaeological record of the Archaic Tradition displays evidence of the beginnings of cultural variation. Notched and stemmed projectile points, along with ground-stone tools and chipped-stone scrapers, knives, punches, and drills, are found in the Archaic toolkit. About 7,000 years ago, copper implements appeared and continued to about 3,500 years ago.

Four distinct Archaic contexts have been identified in Minnesota including the Shield Archaic, Lake-Forest Archaic, Prairie Archaic, and Eastern Archaic. Site locations during this time are generally tied to locations near water. These locations would have been occupied for longer periods and would show larger amounts of artifact deposition. However, small encampments can be found scattered throughout the environment. These types of sites often represent an area of specific resource extraction or a location that takes advantage of a seasonal event such as a bison kill site, a flora gathering site, or a waterfowl breeding site. Artifact deposition at these locations is generally very minimal.

Woodland Tradition (500 B.C. - A.D. 1650)
Beginning about 3,000 years ago, Minnesota's climate began to stabilize and resembled the climate that exists today. Expanses of prairie were found in the western portion of the state near the current Project Area. A swath of oak savanna, stretching from the northwest to the southeast, separated the prairie from the pine forests of the arrowhead region. Woodland period cultures exhibit evidence of an increasingly sedentary lifestyle. Domestication of plants, ceramic technology, long-term re-occurring occupation of seasonal village sites, and mound construction emerged in the Woodland period. These innovations were not adopted in all areas of the state at the same time or necessarily together. Because they are not as deeply buried, Woodland sites are encountered more often than Paleoindian or Archaic sites. Woodland sites can also be more definitively attributed to a tradition based on ceramics and distinct tool types. Known ceramic traditions have allowed the Woodland period to be divided into an Early, Middle, and Late chronological framework. In Minnesota, the Woodland tradition is also divided into an earlier Initial Woodland period (including the Early and Middle periods, (ca. 500 B.C. - AD 500) and a later Terminal Woodland period (including the Late period, ca. AD 500-1650).

Regional differences in the Woodland period resulted in the identification of distinct regional complexes such as such as Howard Lake, Fox Lake, Malmo, and Laurel. Within central Minnesota, a Transitional Woodland period, from 500 to 1000 A.D., has been defined and is associated with St. Croix and Onamia ceramics. Within Northern Minnesota, the geographic

distribution of the distinctive ceramics and burial practices of the period have allowed archaeologists to identify archaeological cultures such as Kathio, Blackduck, and Psinomani. In northern Minnesota, it was Terminal Woodland people who met the first Europeans to visit the state in the middle of the seventeenth-century (Gibbon, Johnson, and Hobbs, 2002).

Mississippian/Plains Village (A.D. 1000 – 1500)

About 1000 years ago, a new tradition developed in southern Minnesota. In the western part of the state, this tradition is known as the Plains Village Tradition, and in the eastern part of the state, this tradition is known as the Mississippian Tradition. These traditions are distinguished from Woodland traditions by an intensification of agriculture, including cultivation of corn, and larger, more complex societies. These influences spread into southwestern Minnesota from the Missouri River and into southeastern Minnesota from the Mississippi River and have possible ties to cultures of the southern United States and possibly Mexico. Mississippian/Plains Village sites are distinguished by distinct ceramic styles, large village complexes, a greater density of artifacts, and community vegetable storage pits. Effigy mounds in the shape of animals such as birds and snakes, as well as flat-topped mounds and villages encircled by protective palisades, were constructed in this period.

Fur Trade/Contact (1630s – 1858)

By the 1620s, the first European goods may have reached the upper Midwest through trade with the Ottawa and Huron. The first fur trade contact in this area occurred between 1659 and 1660 when two French explorers named Sieur des Groseilliers and Sieur de Radisson entered present day Minnesota in search of natural resources such as furs. Increasing number of explorers and fur tradesmen would reach the area in the years following first contact. This time period is recognized by the establishment, operation, and adaptation of gathering fur-bearing mammals in exchange for other goods and materials. This exchange linked the Northern Plains to a worldwide economic and political system. By the late 1670's a trade agreement had been established between the Dakota and merchants in Quebec and Montreal. This relationship initiated the French period of exploration and occupation in Minnesota, which lasted into the early 1760's. During this period of French influence much of the state and the surrounding region were occupied with an extensive network of forts and fur trading posts.

The 1760s, following the Treaty of Paris, brought a half-century period of British activity to Minnesota. This time period brought further development of the fur trade industry with more trading posts, and consequently, major changes in the distribution of Native American people in the region. By 1800, the Ojibwa took control of the lakes and forests of northern Minnesota, and the Dakota moved south along the Minnesota River valley.

After a peace treaty with the British in 1763, The United States gained legal possession of the state. The United States exerted control of Minnesota after Zebulon Pike's 1805-1807 expedition, and later with the establishment of Fort Snelling at the junction of the Minnesota and Mississippi rivers in 1819. The changes in Native American life brought about by the French and British presence in Minnesota included migrations of Native American populations from the east, depopulation of native peoples in certain areas because of introduced diseases and warfare, and gradual movement of the Ojibwa into northern Minnesota and the Dakotas into southern

Minnesota. The Native American populations in Minnesota also began to switch from hunting for subsistence to hunting for trade, and Native American manufacturing materials began to be replaced by European materials.

Travel and settlement of the state were mostly restricted to corridors along larger bodies of water. In 1837 the Dakota, Winnebago, and Ojibwa signed treaties that opened up east-central Minnesota to logging and settlement, and by 1849 Minnesota had become organized as a territory. Following the establishment of Minnesota as a state in 1858, Euro-American settlement increased, bringing a wave of new towns, cities, and non-fur trade-related enterprises.

Lyon County was organized in 1870, parceled out from a larger Redwood County. Stanley Township lies on the east edge of the county bordering Redwood County. The first permanent Euro-American settler located in Section 24 of Stanley Township in 1867 (Anderson 1970). The township received a large number of Scottish immigrants, primarily in the northern half, with mostly American settlers in the south (Case 1884).

Literature Search

HDR staff conducted a site file search at the MHS and the SHPO. This site file search focused on previously identified archaeological sites, previously identified architectural properties, and previous surveys within one mile of the proposed development parcel. In addition to the background research conducted at MHS and SHPO, HDR reviewed General Land Office ("GLO") maps accessed online through the Bureau of Land Management Website at http://www.glorecords.blm.gov.

Previous Archaeological Sites

No previously recorded archaeological sites were identified in the Project Area or within one mile of the Project Area.

Previous Architectural Properties

No previously recorded architectural properties were identified in the Project Area or within one mile of the Project Area.

Previous Cultural Resource Surveys

According to the files available at SHPO, there have been seven previous cultural resource investigations within one mile of the Project Area (Table 2 and Figure 3). Three previous investigations (MULT-08-11, MULT-10-04, and MULT-11-11) included Phase I fieldwork and intersects with the Project Area. The remaining previous investigations are either literature reviews only or did not include any survey within the Project Area.

Table 2. Previous Cultural Resource Surveys within one mile of the Project Area

Report Number	Report Year	Report Title	Authors	Intersects Project Area

Report Number	Report Year	Report Title	Authors	Intersects Project Area
LY-07-02	2007	Phase IA Archaeological Resources Assessment of Stanley and Clifton Townships in Eastern Lyon County, Minnesota*	Stemper, C.	No
LY-12-01	2012	Phase I Archaeological Reconnaissance Survey for Lyon County Substation to Cedar Mountain Substation and Cedar Mountain Substation to Franklin Substation Segments of the CapX2020 Brookings County to Hampton 345 kV Transmission Line Project	Eigenberger, D.	No
MULT-80-05	1980	Cultural Resources Literature Search and Records Review of the Upper Minnesota River Subbasin, Southwestern Minnesota and North Eastern South Dakota*	Archaeological Field Services, Inc.	No
MULT-08-11	2008	Great River Energy: Milroy to Sheridan Area 69 kV Transmission Line Projects, Phase I Reconnaissance Survey in Lyon and Redwood Counties, Minnesota	Sabatke, S.	No
MULT-10-04	2010	A Phase I Archaeological Field Investigation for Proposed Rural Waterline Land Corridors on Parts of Lyon and Redwood Counties, Minnesota	Stemper, C.	Yes
MULT-11-11	2011	Phase I Cultural Resources Survey, Woodstock Telephone, Lyon, Pipestone and Rock Counties, Minnesota	Aymond, A. Moose, C. Rothaus, B. Rothaus, R.	Yes
MULT-14-01	2014	Phase I Archaeological Reconnaissance Survey for the SD/MN Border to Lyon Substation Segment of the CapX2020 Brookings County to Hampton 345 kV Transmission Line Project	Eigenberger, D.	No

GLO Maps

GLO survey maps corresponding to the Project Area were accessed online through the Bureau of Land Management Website at http://www.glorecords.blm.gov/. HDR examined the GLO maps to identify areas that may have potential to contain historical era cultural resources, as well as water features that may no longer exist. Archaeological sites may be present where historic resources have been documented on the GLO maps, or near former water features.

Features depicted on the 1867 GLO map within the Project Area include two wagon trails and several marshes. The Redwood River is depicted just north of the Project Area. The Project Area appears to have been relatively wet at the time of Euro-American settlement and witness corners were used for multiple inaccessible locations within marshes. The only cultural resource in the Project Area shown on the plat is a wagon road running through the north half of Section 33. The Detailed information regarding the location and resource types found in the Project Area is presented in Table 3 and in Figure 4.

Table 3. GLO Resources and Features in the Project Area

County	Township	Range	Sections	Date	Feature/Locations
Lyon	111 N	40 W	3	1867	Marsh covering large area in the S ½ of the section
Lyon	111 N	40 W	4	1867	Marsh in the SE ¼ of section 4 extending into the NE ¼ of section 9
Lyon	112 N	40 W	20	1867	Marsh in the SE ¼ extending into section 29
Lyon	112 N	40 W	22	1867	Marshes in the SE ¼ extending E
Lyon	112 N	40 W	27, 32, 33, 34	1867	"Wagon Road" running SW-NE from the SW ¼ of section 32, through the N ½ of section 33 and 34 and to the SE ¼ of section 27
Lyon	112 N	40 W	27	1867	Two small marshes depicted in the NE ¼
Lyon	112 N	40 W	29	1867	Marshes in the SW ¼ and in the NE ¼ extending into section 20
Lyon	112 N	40 W	32, 33	1867	Marsh in the NE ¼ and SE ¼ of section 32 extending into the NW ¼ and SW ¼ of section 33
Lyon	112 N	40 W	34	1867	Small marshes in the NE ¼ and SE ¼

Plat Map of 1916 and 1938 Aerial

A plat of Minnesota counties was published by W.W. Hixson & Company of Rockford, Ill., in 1916. The plat for Lyon County shows two structures in Section 28, in the same locations as shown on existing maps and the1938 aerial photograph along the west border of the section (the NW ¼ and SW ¼ of section 28) (Figures 5 and 6). There is no structure shown along the border of Sections 28 and 33 where current maps and aerial photos show a residence. Presumably, this rural residence was constructed after 1916.

Previously Recorded Historic Properties on the National Register

The online National Register of Historic Places ("NRHP") database was searched for registered properties within the Project Area and within one mile of the Project Area. No NRHP registered archaeological or historic resources are located within one mile of the Project Area.

Archaeological Potential

The Project Area lies within the Prairie Lakes archaeological region of Minnesota. This region was historically prairie, and offered typical prairie resources to past inhabitants. According to Anfinson (1990), major camps would have been located near the wooded areas surrounding major lakes and streams. Resource procurement areas, such as bison kill sites or prairie plant harvesting areas, could be anywhere in the uplands, but because of extensive agricultural tillage, many of these types of small, ephemeral activity sites have been disturbed and scattered by the plow. The Project Area is not located near any large lake or streams, and while the now-drained wetlands and sloughs in the area would have offered waterfowl hunting opportunities, the archaeological remains of such activities are typically scant. In addition, the flat, featureless landscape offers no prominent vantage point for observing game or for Native American ceremonial activities. Any cultural material found in the Project Area would most likely be related to the historic agricultural period. The Project is not planned to directly affect any of the nearby farmsteads in Sections 28 and 33.

Recommendations

The absence of listed archaeological and/or historic facility resources does not mean the Project Area is clear of resources eligible for listing on federal or state historic registers. However, the chances are low that significant unrecorded resources may occur within the Project Area. HDR recommends that if a Phase I reconnaissance survey is completed for the Project Area; it should concentrate on landforms composed of nonhydric soils (Figure 2).

References

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Anfinson, S. F.

1990 Archaeological Regions in Minnesota and the Woodland Period. In The Woodland Tradition in the Western Great Lakes: Papers Presented to Elden Johnson, edited by G. E. Gibbon, pp. 135-166. University of Minnesota Publications in Anthropology No. 4, Minneapolis.

Archaeological Field Services, Inc.

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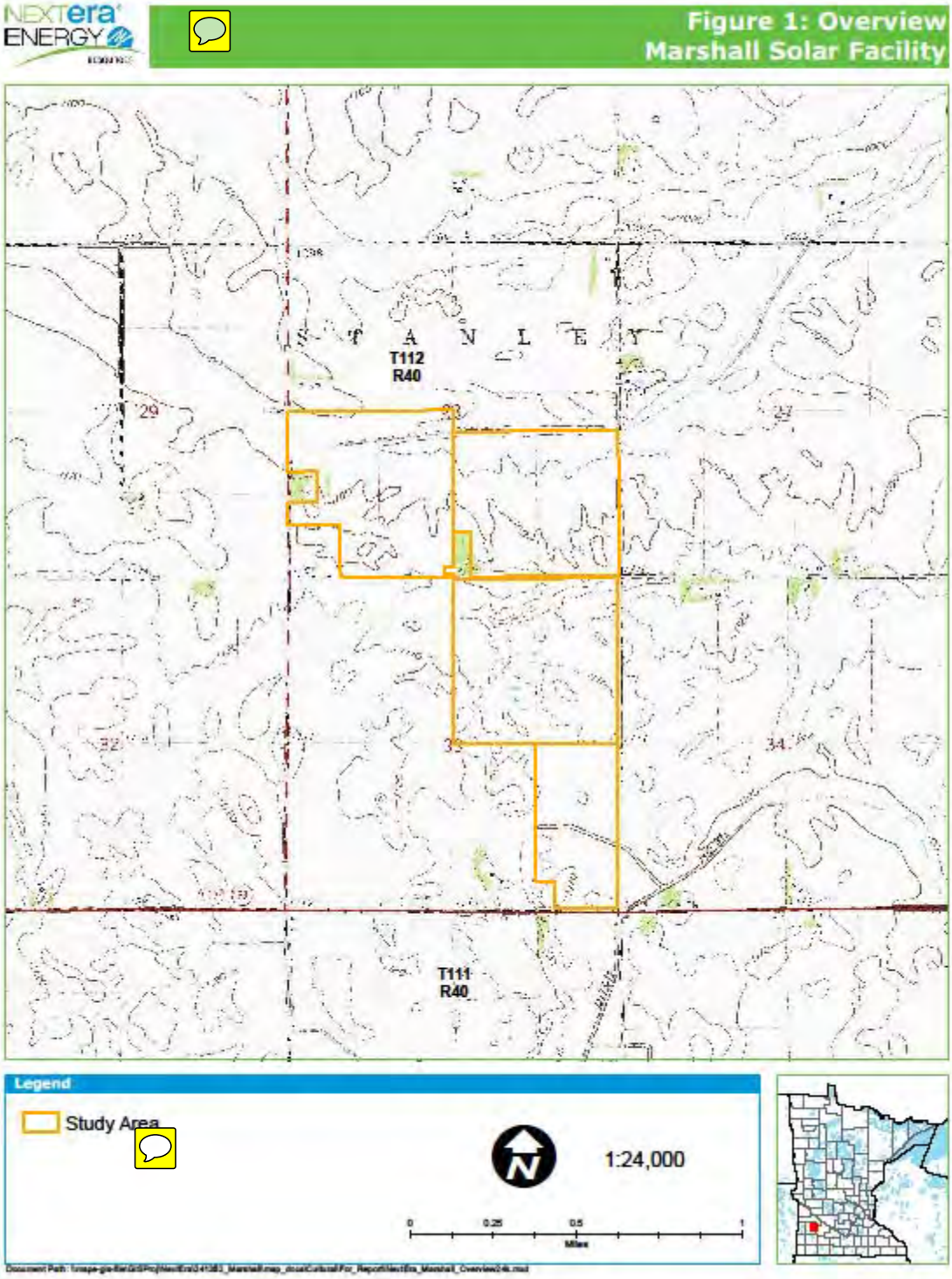
NEXTera ENERGY
Figure 1: Overview
Marshall Solar Facility
S T A N L E Y
T112
R40
T111
R40
Legend
Study Area
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0
0.25
0.5
1
Miles

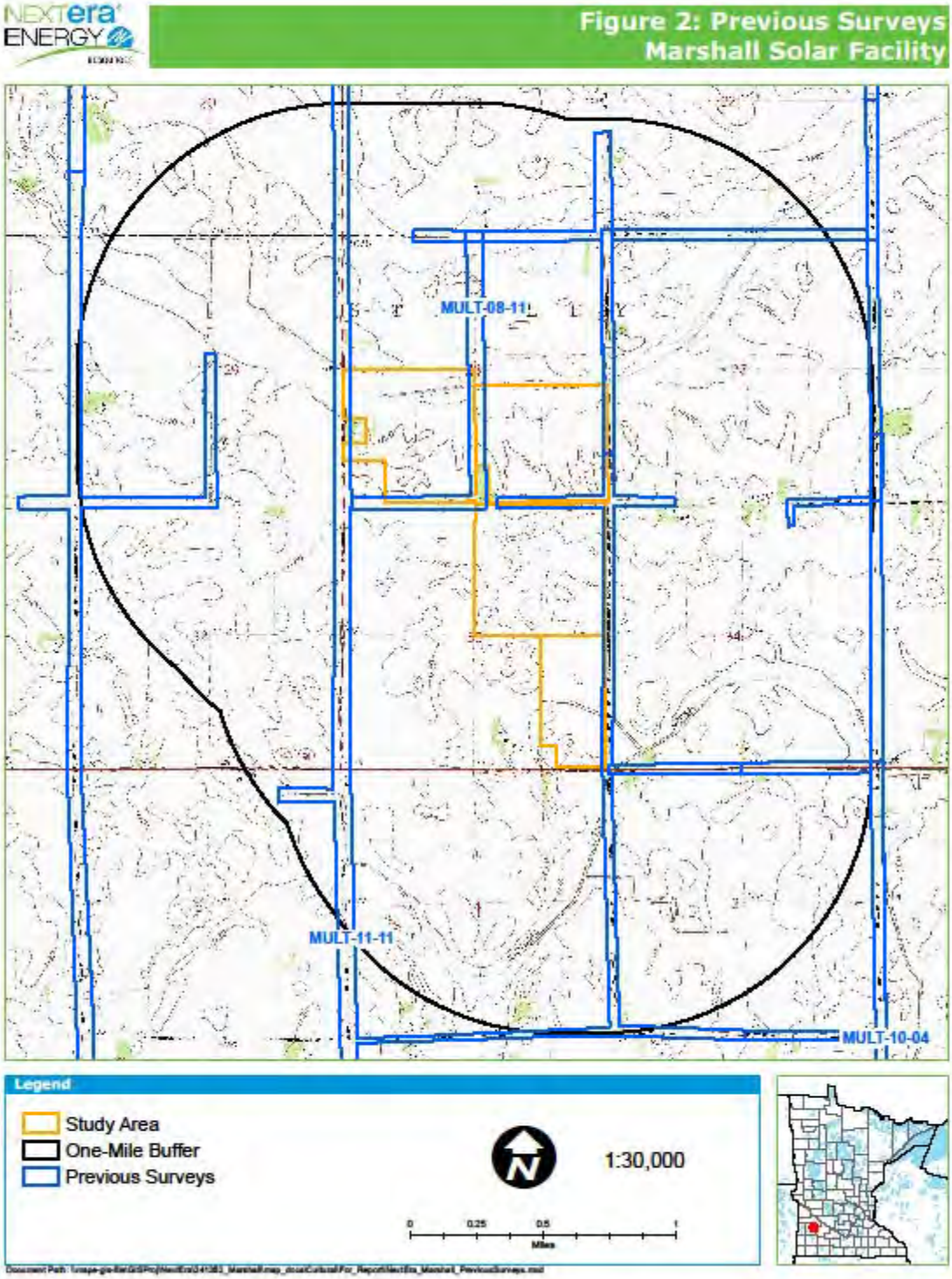
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Figure 2: Previous Surveys
Marshall Solar Facility
MULT-08-11
MULT-11-11
MULT-10-04
Legend
Study Area
One-Mile Buffer
Previous Surveys
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0
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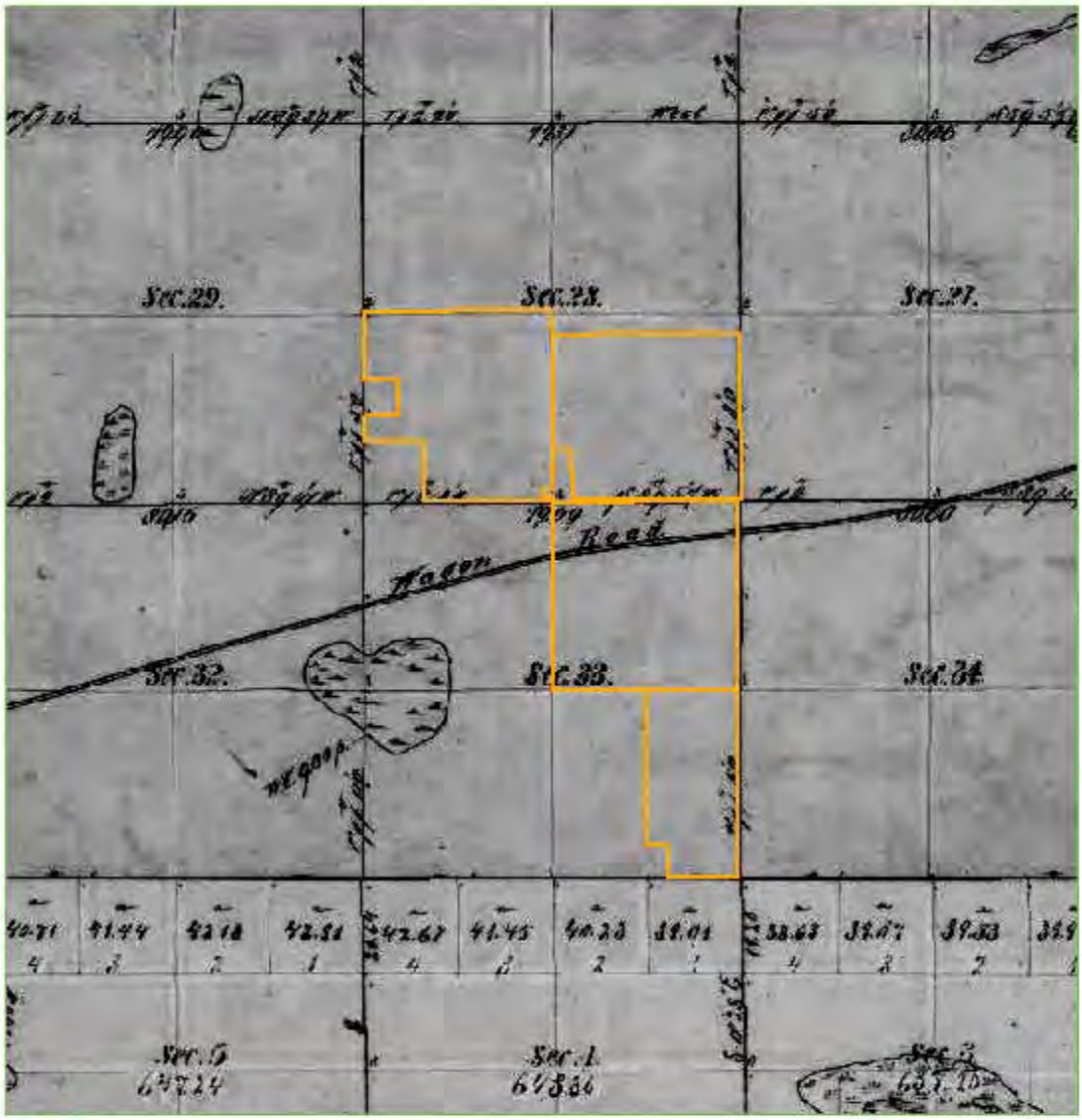
Figure 3: GLO
Marshall Solar Facility



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Study Area

1:24,000

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Miles

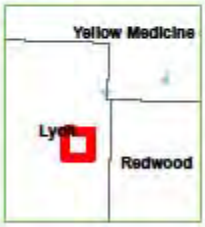
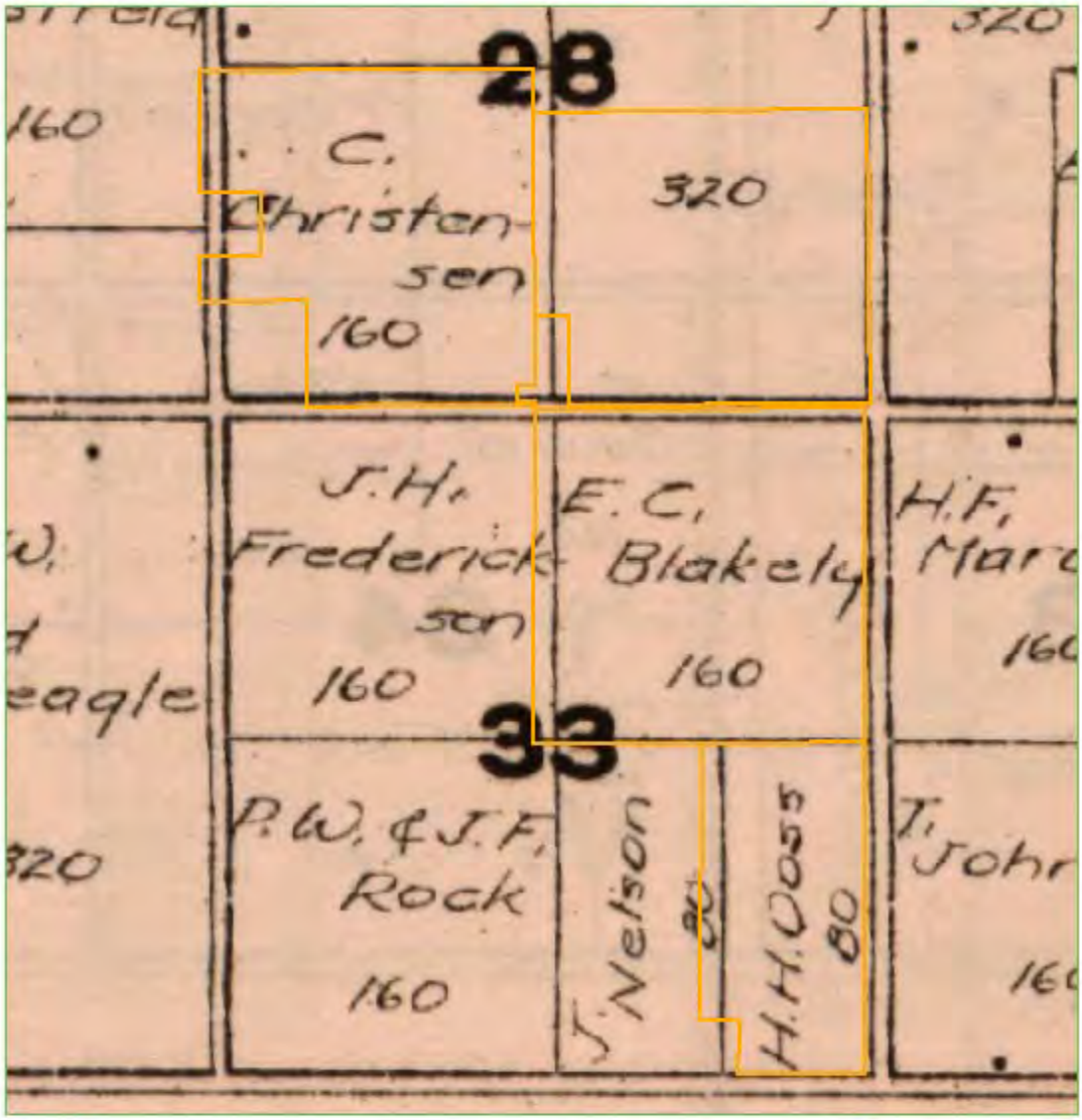


Figure 4: 1916 Plat
Marshall Solar Facility



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Study Area

1:13,500

0 1,000 2,000
Feet

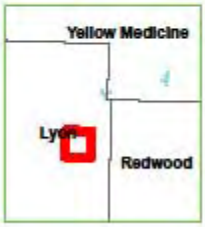
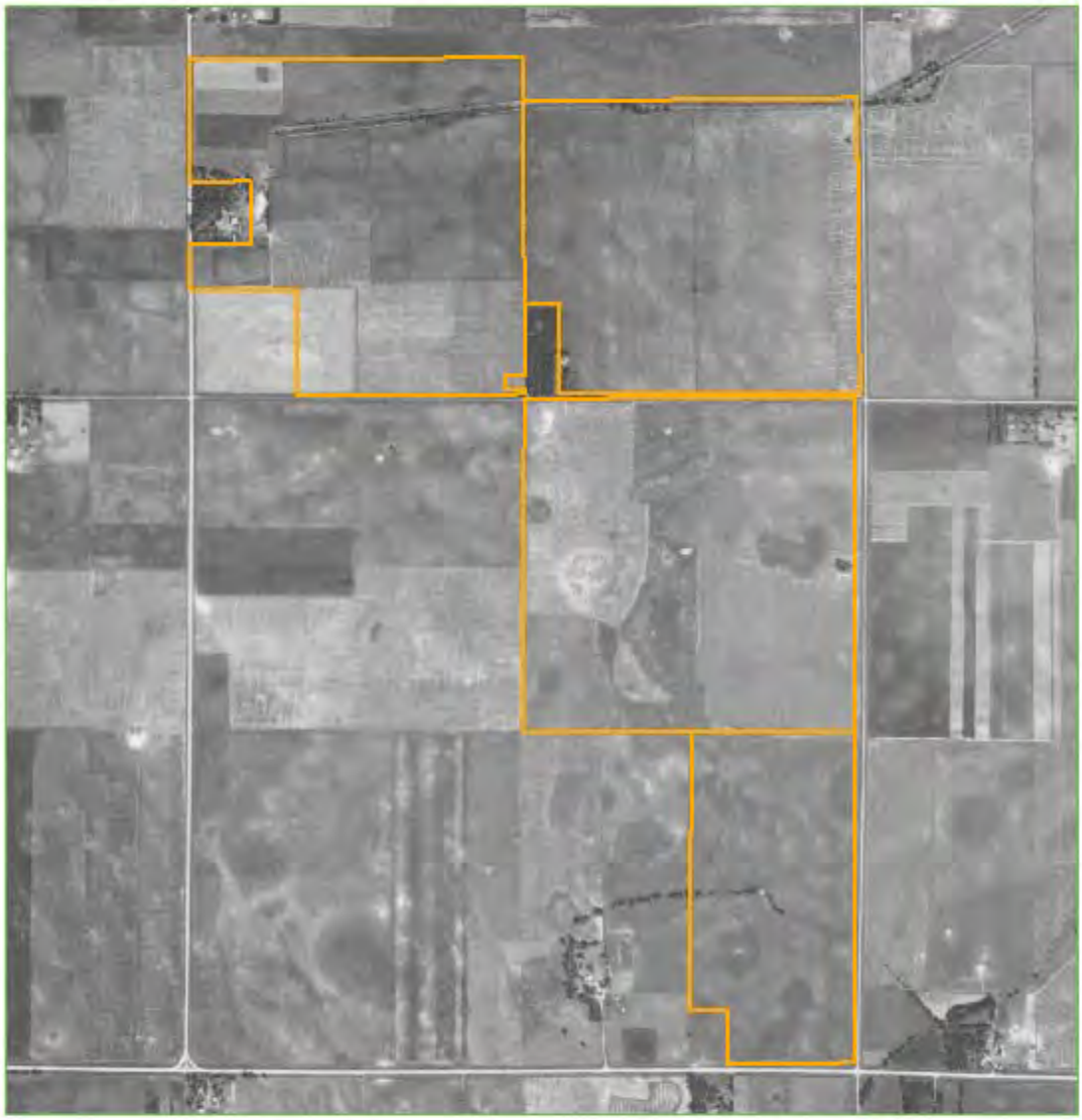


Figure 5: 1938 Aerial
Marshall Solar Facility



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Study Area

1:13,500

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Feet

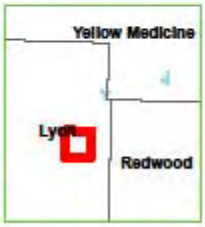
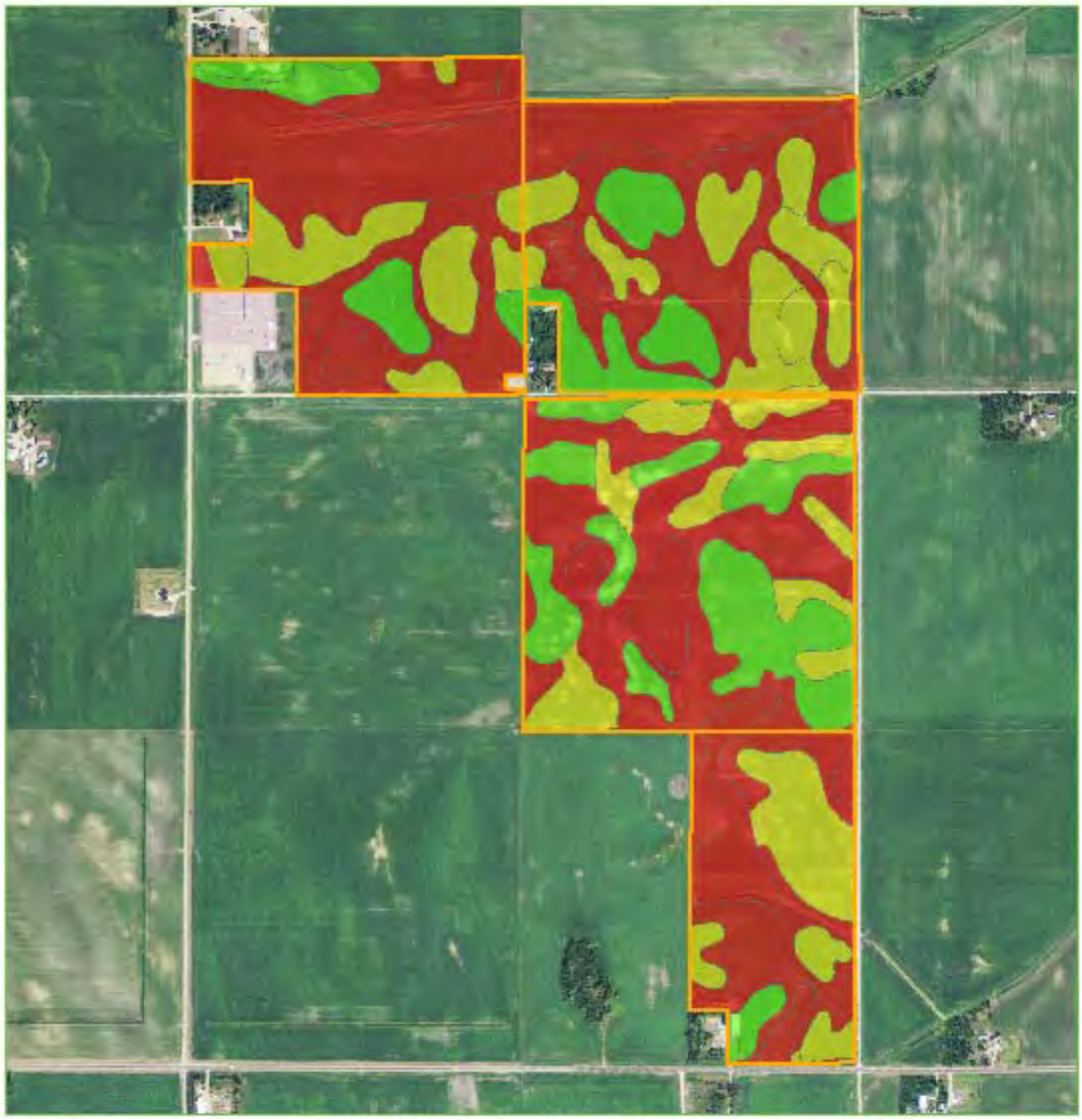


Figure 6: Hydric Soils
Marshall Solar Facility



Legend

Study Area

Study Area Soils - Hydric Rating

- Hydric
- Predominantly Nonhydric
- Nonhydric

1:13,500

0 1,250 2,500
Feet

Technical Memorandum

Date:	December 18, 2014
Project:	Marshall Solar Energy Project
Author::	Michael Swenson HDR
Subject:	Wetland Delineation

Introduction

This memorandum documents the methodology and results of the delineation of potential wetland areas located within the proposed Marshall Solar Energy Project by HDR Engineering, Inc. (HDR). Marshall Solar, LLC is proposing to build a utility scale photovoltaic solar project in Lyon County, Minnesota. The results of this delineation will be used in the design and implementation of the solar facility.

A draft of this memorandum was reviewed by both the Lyon County Soil and Water Conservation District and the U.S. Army Corps of Engineers. Revisions to the memorandum were prepared based on comments received from both regulatory agencies (Appendix C).

Location

The proposed project is located in Sections 28 and 33 Range 40W Township 112N in Lyon County approximately four miles east of the city of Marshall. Major roadways in the area include County Highways 9 and 11 and State Highway 19. The 504-acre study area is located adjacent to 290th Street and 320th Avenue, one-half mile north of State Highway 19, and adjacent to Highway 9. A 69 kilovolt (kV) and a 115 kV transmission line are located through the middle of the study area and an additional 115 kV transmission line is located adjacent to the western boundary (Figure 1). A new 345 kV transmission line traverses the study area from east to west just north of the homestead along 290th and enters the existing substation from the east (Not pictured in Figure 1). The site is currently in agricultural (row-crop) production, and is surrounded by agricultural land.

Methods

An initial offsite evaluation for the presence of wetlands was performed using available information, including United States Geological Survey (USGS) topographic maps, United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Mapping, Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database, and Farm Service Agency (FSA) National Aerial Imagery Program (NAIP). Because the site is in agricultural production, and therefore lacks normal circumstances for assessing the plant community over most of the site, HDR performed an historical aerial photo review of the project area to identify potential wetlands via indicators of possible wetland hydrology. The review was

performed in accordance with mapping conventions recognized by the Minnesota Board of Water and Soil Resources (BWSR 2010). According to the BWSR guidance, “In general, review of aerial imagery for assessing wetland hydrology is more accurate in agricultural fields that were planted with annually seeded row crops such as soybeans and corn. These fields will often show signs of crop stress, standing water, or drowned out crops in summer aerial imagery when wetland hydrology is present.” Areas identified as having signs of crop stress, standing water, or drowned out crops on aerial imagery were assessed for wetland hydrology using the BWSR guidance, and then examined during onsite field inspections.

Onsite wetland delineation was conducted using the “Routine Determination, Onsite Inspection Necessary” method outlined in the 1987 United States Army Corps of Engineers (USACE) Wetlands Delineation Manual (USACE 1987) and the Midwest Regional Supplement (USACE 2012).

In general, wetland delineations conducted under normal circumstances are based on the presence of the following three parameters:

- The area must exhibit indicators of wetland hydrology
- The area must have a predominance of hydrophytic vegetation
- Hydric soils must be present

Sample plots were collected at locations identified in the field within the study area as having potential for wetland hydrology indicators (i.e. depressional features, areas of standing water, areas showing crop stress, etc.) and evaluated for all potential wetlands to determine if they met the wetland criteria. At each plot location, a soil pit was dug for observation of soil and hydrology characteristics. Hydric soil and wetland hydrology characteristics were identified using methods described in the *1987 Manual* and *Midwest Regional Supplement.* The vegetation was analyzed for plant species dominance in a 6-foot radius from the sample pit for the herbaceous layer. The wetland indicator status of plants was identified using the USACE *National Wetland Plant List of 2014-Midwest Region (Lichvar and Kartesz 2009)*. Data points were mapped using a GPS unit with sub-meter accuracy.

Results

Desktop Analysis Results

The SSURGO Database for Lyon County indicates the soils on the site as shown on Figure 2 and listed in Table 1, along with the hydric status of each mapped soil. The NWI did not indicate any mapped wetlands within the proposed study area (Figures 3 and 4). U.S. Geological Survey (USGS) digital mapping (USGS 1993) indicated the presence of two unnamed streams located within the study area (Figure 2), draining into mapped Minnesota Department of Natural Resources (DNR) Public Waterways (PWI) unnamed feature to the northeast, and Clear Creek to the southeast (Figures 1 and 2). These streams appeared on the aerial photography to be excavated perennial drainage ditches, which was later confirmed during field investigations.

Table 1. Study Area Soils

Map Unit Symbol	Soil Map Unit Name	Hydric Category
86	Canisteo clay loam	Hydric
127	Sverdrup sandy loam, 0 to 2 percent slopes	Nonhydric
127B	Sverdrup sandy loam, 2 to 6 percent slopes	Nonhydric
246	Marysland loam	Hydric
276	Oldham silty clay loam	Hydric
339	Fordville loam, 0 to 2 percent slopes	Nonhydric
339B	Fordville loam, 2 to 6 percent slopes	Nonhydric
341	Arvilla sandy loam, 0 to 2 percent slopes	Nonhydric
341B	Arvilla sandy loam, 2 to 6 percent slopes	Nonhydric
341C	Arvilla sandy loam, 6 to 12 percent slopes	Nonhydric
421B	Ves loam, 1 to 4 percent slopes	Predominantly Nonhydric
421B2	Ves loam, 3 to 6 percent slops, eroded	Nonhydric
423	Seaforth loam, 1 to 3 percent slopes	Predominantly Nonhydric
953C	Arvilla-Storden-Ves complex, 6 to 15 percent slopes	Nonhydric
954C2	Storden-Ves loams, 5 to 12 percent slopes, eroded	Predominantly Nonhydric
1029	Pits, gravel	Nonhydric
L84A	Glencoe clay loam, depressional, 0 to 1 percent slopes	Hydric

Source: SSURGO Soil Data for Lyon County, Minnesota. USDA NRCS (2014).

Historical Aerial Photography Interpretation results

A review of historical climate data for the study area was performed against the dates of historical aerial photos readily available through the FSA NAIP. BWSR guidance states that historical photographs should be reviewed for indicators of wetland hydrology when normal precipitation conditions are present. Normal conditions are determined by considering precipitation data from the three months prior to the date of the imagery and weighing that data based on the length of time since the precipitation contributed to the water budget (i.e. more recent precipitation is given greater weight). The Minnesota Climatology Working Group (MNCWG, 2014) has an online calculator that provides a multi-month precipitation score for each aerial image reviewed. Scores of 6 to 9 are considered “dry”, 10 to 14 “normal”, and 15 to 18 “wet”. Of the publicly available FSA NAIP aerial photos, 2003, 2004, 2005, 2006, 2008 and 2010 had normal precipitation multi-month scores and therefore were selected for use in the historical aerial photography review (Table 2).

Table 2. Historical Aerial Photography Information

Year of Photo	Date of Photo	MNCWG Multi-Month Score
2003	August, 26	12 – Normal
2004	July, 8	13 – Normal
2005	August, 7	12 – Normal
2006	July, 14	11 – Normal
2008	July 13	13 – Normal
2010	June, 16	10 – Normal

For an aerial signature (location with crop stress, drownout, or standing water) to test positive for potential wetland hydrology, signs of wetland hydrology must be present in more than 50% of the years of historical photography reviewed. Crop stress is a difference in vegetative vigor of planted crops as compared to surrounding conditions, and can be caused by wetness. It is often seen as a different color than surrounding vegetation of the same type on aerial photos. In reviewing the aerial photography against the LiDar elevation information it was apparent that many areas that show signs of crop stress in the study area occur along slopes and hilltops. This stress is likely due to excessively drained and poor soil conditions along the slopes within the study area rather than being associated with depressional areas or mapped hydric soils where crop stress would be considered indicative of wetland hydrology (Figure 3.1). Therefore, only areas where crop stress was observed in areas with corresponding geomorphic landscape position (depressional areas) were considered as potential signatures of wetland hydrology.

Of the six years of aerial photographs in Table 2, no areas had crop stress in the 2003, 2005, 2006 or 2010 photos. Crop stress was identified in 2 locations in the 2004 photo (Figure 3.2) and in 3 locations the 2008 photo (Figure 3.3), for a total of 5 distinct areas that had crop stress,

but no areas had signs of crop stress in more than one year. No areas on the site meet the requirement of having signs of crop stress in 50% of the aerial photos reviewed (at least 3 photos) and therefore there is insufficient evidence that wetland hydrology is present at these locations.

Wetland Delineation Results

HDR visited the study area on June 11th, 2014 to perform additional investigation and to reaffirm the findings of the initial desktop review. The field investigation indicated that the entire area of the proposed project is comprised of row cropped agricultural field. No native vegetation was identifiable onsite. Three areas of significant crop stress/standing water were identified onsite (Figure 4). Two of these areas (WDP 2 and WDP 3) corresponded with areas of crop stress in the aerial photo review, but WDP 1 did not have signs of crop stress in the aerial review. The remaining three areas with signs of crop stress in the aerial photo review were all observed to have healthy crops with no standing water or crop stress at the time of the site visit.

WDP1, 2 and 3 were investigated and all determined to be non-wetlands. Field investigation did not identify indicators of hydric soils or hydrophytic plant communities on site at the three locations. The multi month precipitation score for the time of the onsite investigation was listed as 12, which is considered “normal” (MNCWG 2014); however, during the 10 days prior to the onsite investigation the site received a total of 4.58 inches of rainfall (USDA 2014). The average rainfall for this area is 3.4 inches for the entire month of June. This excessive rainfall resulted in extremely wet conditions at the time of the investigation, which was the cause for standing water to be located at the areas investigated. HDR collected USACE determination data forms at all three investigated locations, and these data forms are included in Appendix A. Locations of the data points are included in Figure 4. Ground level photography of the three investigated locations is shown in Appendix B.

Two excavated perennial drainage features are located on the site, one near the northern boundary and the second near the southern boundary. Both of the features are heavily impacted by channelization to facilitate agricultural drainage. The features are approximately 7 to 10 feet deep with 2:1 side slopes that are vegetated with a mixture of reed canary grass (*Phalaris arundinacea*) near the base of the slope and smooth brome (*Bromus inermis*) near the top of the slope. The features are approximately 2 feet wide and the substrate composition is primarily silt with some sand mixed in. Multiple drain tile outlets were observed that discharge to the drainage features. Photos of the drainage features are shown in Appendix B.

Open drainage tile inlets were observed within the study area at multiple locations (See Figure 4). It is likely that the installation of an artificial drainage system within the study area has created a new normal hydraulic regime that does not allow for wetland hydrology to occur onsite.

Conclusions

Two perennial drainage features are located within the study area. HDR did not identify any wetland areas within the study area. Historical aerial photography review did not identify any

areas of potential wetland hydrology. The onsite review resulted in three locations being identified as potential wetlands. All three locations lacked both hydrophytic vegetation and indicators of hydric soils, and did not have sufficient evidence of wetland hydrology from the aerial photography review. Therefore, it is the opinion of HDR that these areas do not meet the mandatory criteria for a wetland as defined by the *1987 Manual*. Overall the study area has been significantly altered for agricultural activities. The entire site is a monoculture of seeded row crops with no apparent native vegetation onsite resulting in no wetland plant communities. The hydrology of the site has been altered by the installation of a comprehensive below ground tile drainage system and the excavation of two drainage ditches. These alterations to hydrology have resulted in new normal hydrologic conditions that have effectively drained the site, allowing efficient crop production in years with normal precipitation, and no longer allow for wetland hydrology to occur onsite. Although a significant portion of the site is mapped as hydric soils, alterations to hydrology have also changed the soil moisture regime resulting in nonhydric soil conditions.

At this time HDR, on behalf of NextEra, is requesting concurrence with the results of the delineation from the US Army Corps of Engineers – St. Paul District Regulatory Office and the Lyon County Soil and Water Conservation District (Local Government Unit in charge of administering the Minnesota Wetland Conservation Act within Lyon County).

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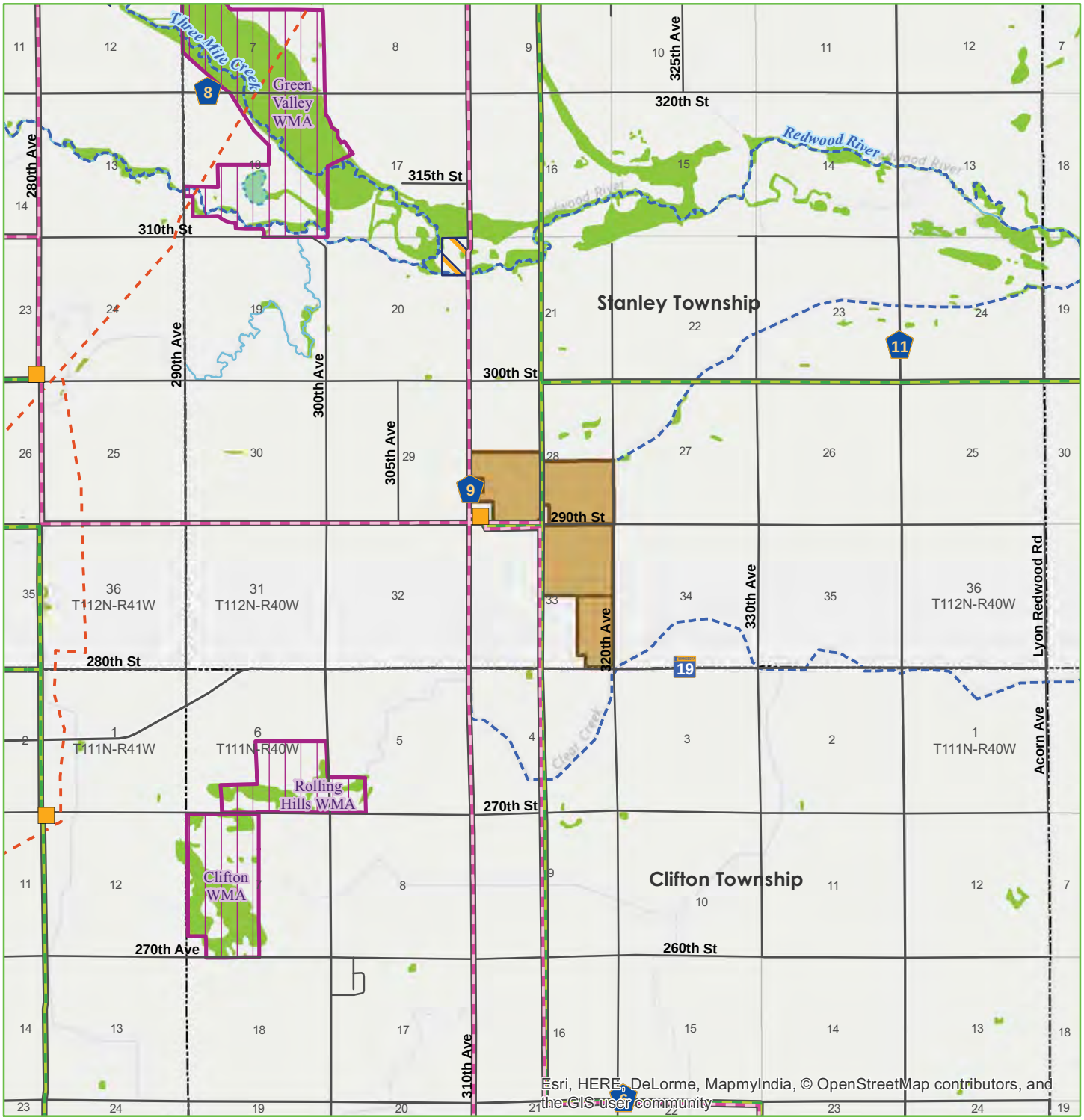
Figure 1: Study Area Location
Marshall Solar Facility



Legend

- Study Area
- **Existing Transmission**
- 69kV AC
- 115kV AC
- Substation
- Pipeline
- PWI Stream
- River / Stream
- PWI Basin
- PWI Wetland
- Waterbody
- NWI Wetland
- Wildlife Management Area
- NRCS Easement
- City / Township Boundary
- Section Line

N

0 0.25 0.5 1
Miles

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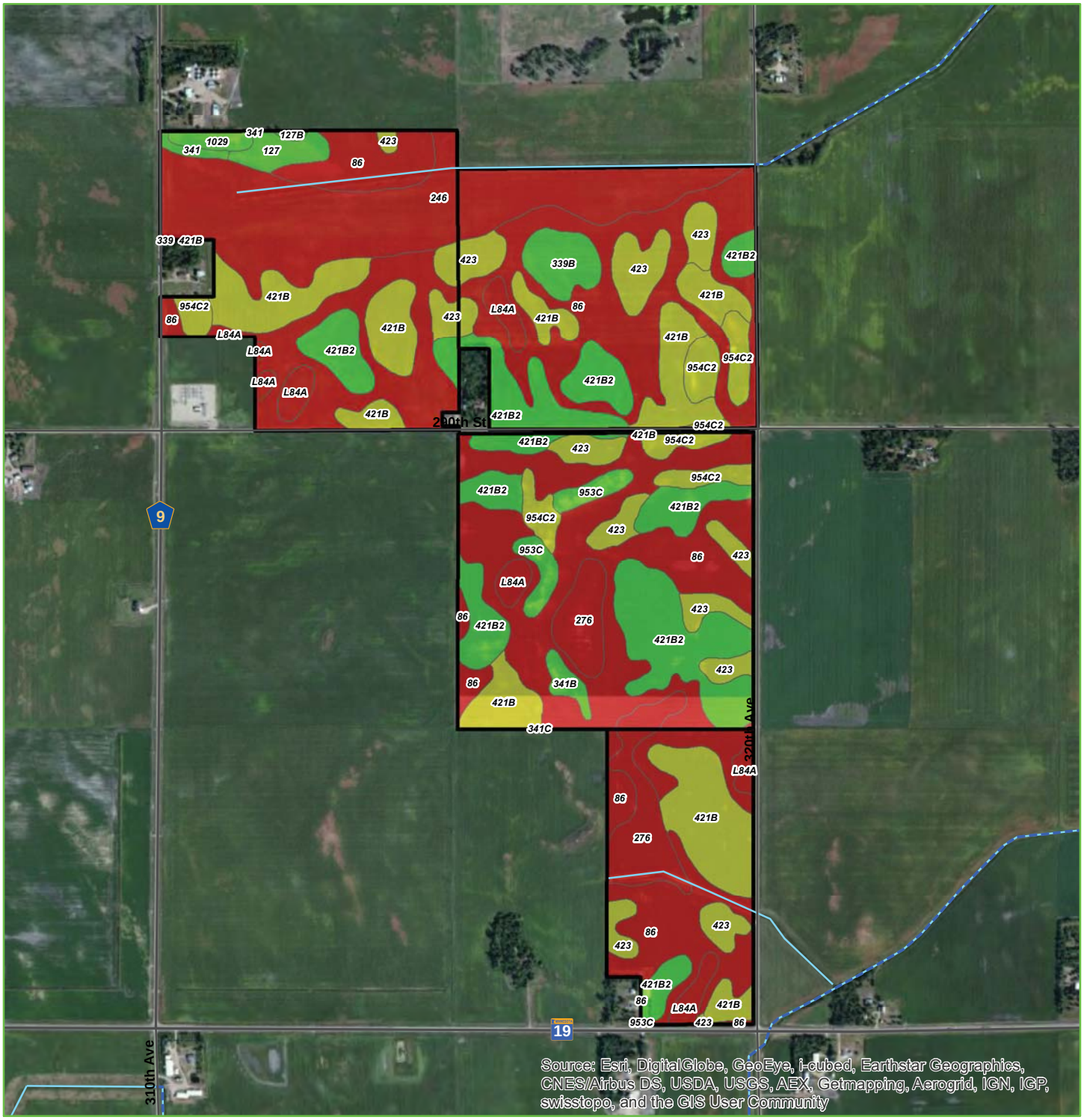
Figure 2: Study Area Soils
Marshall Solar Facility



Legend

- Study Area
- **Study Area Soils - Hydric Rating**
  - Hydric
  - Predominantly Nonhydric
  - Nonhydric
- PWI Stream
- River / Stream
- Waterbody

N

0 500 1,000 2,000
Feet

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Figure 3.1: Study Area Elevation
Marshall Solar Facility

Legend

- Study Area
- Contour
- PWI Stream
- River / Stream
- Waterbody
- NWI Wetland

N

0 500 1,000 2,000
Feet

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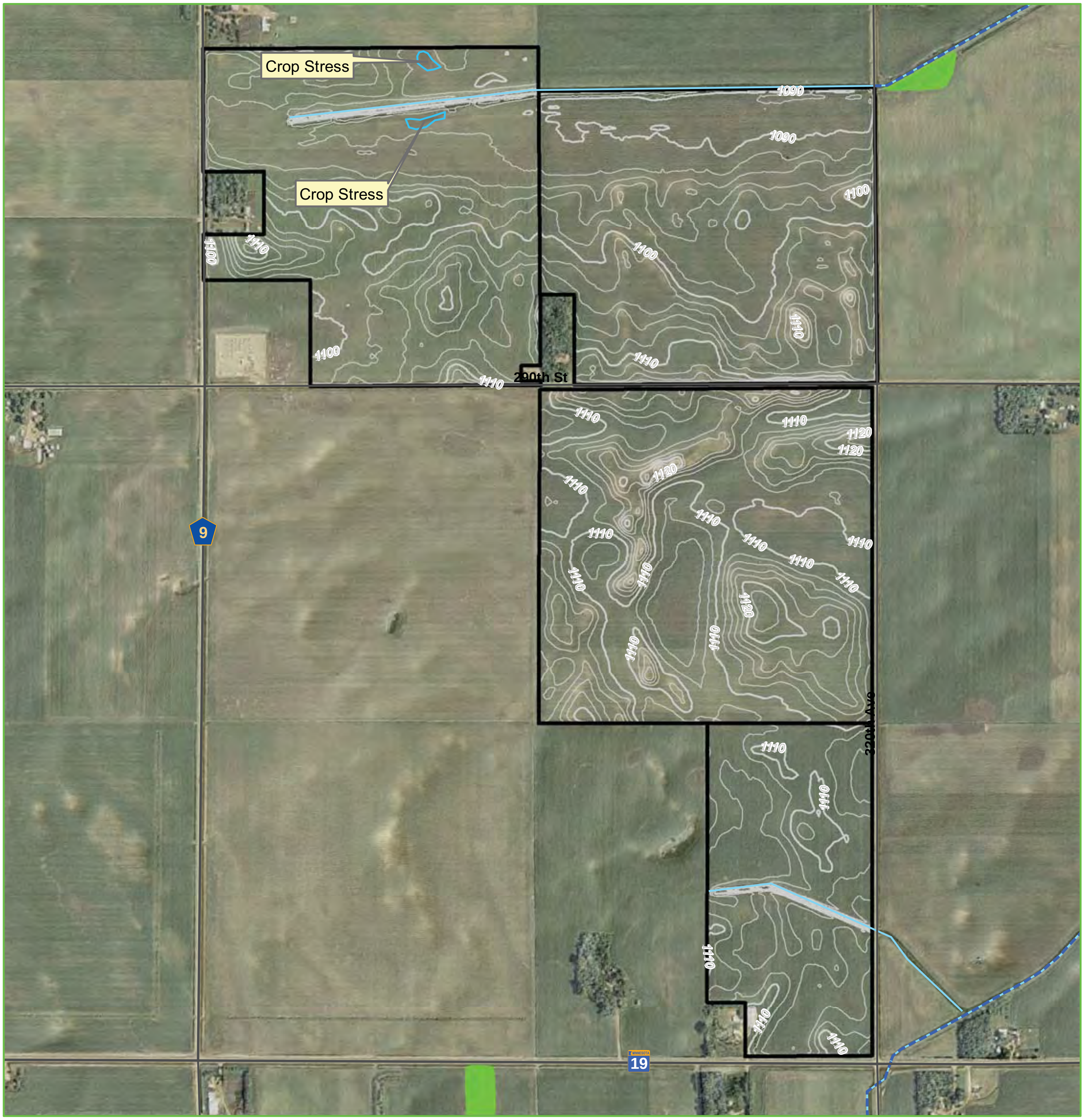
Figure 3.2: 2004 Historical Air Photo Review
Marshall Solar Facility



Legend

- Study Area
- Contour
- Wetland Signature
- PWI Stream
- River / Stream
- Waterbody
- NWI Wetland

N

0 500 1,000 2,000

Feet

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Figure 3.3: 2008 Historical Air Photo Review
Marshall Solar Facility

Legend

- Study Area
- Contour
- Wetland Signature
- PWI Stream
- River / Stream
- Waterbody
- NWI Wetland

N

0 500 1,000 2,000

Feet

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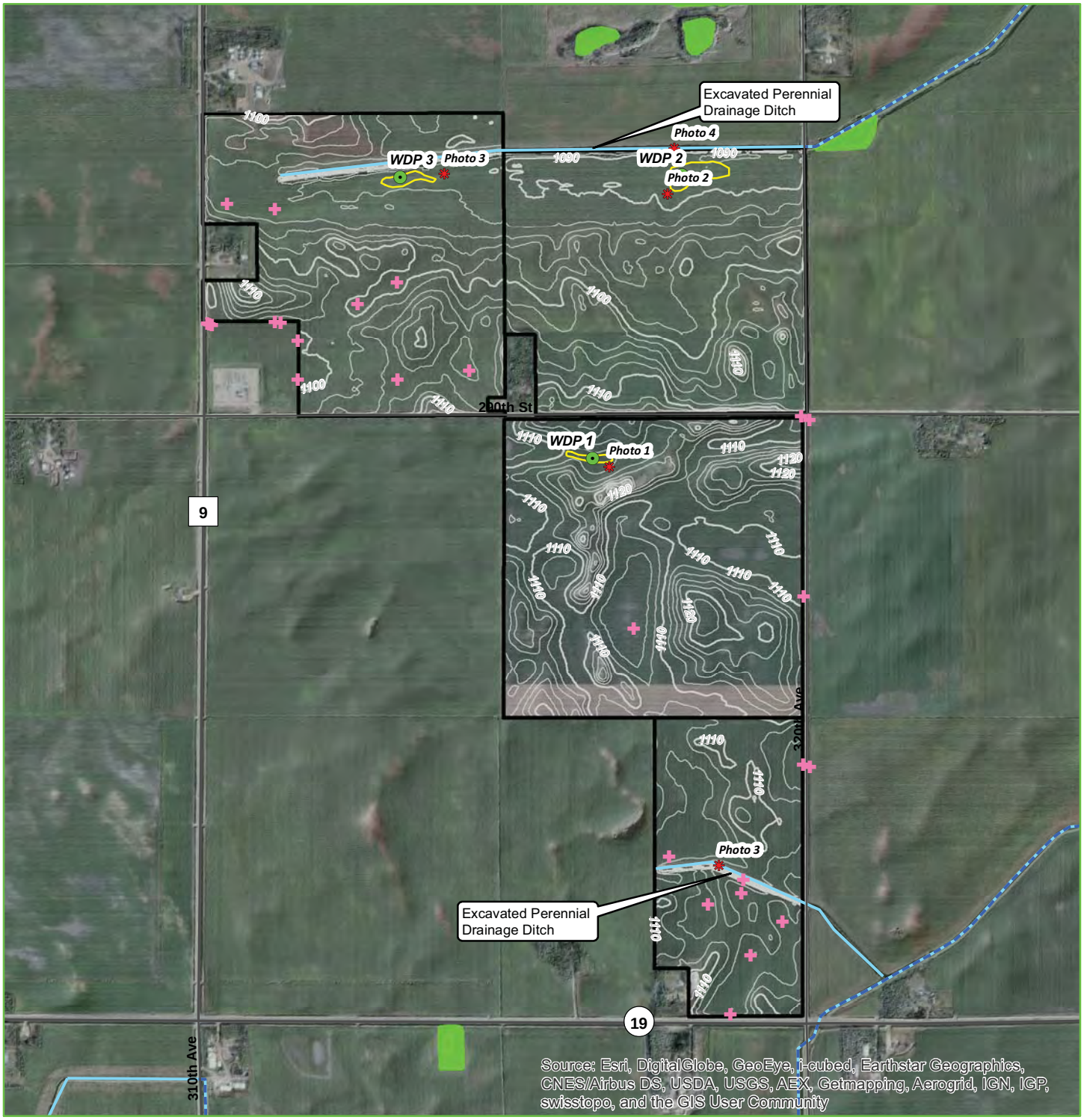
Figure 4: Onsite Review
Marshall Solar Facility



Legend

- Study Area
- Contour
- Field Reviewed Location
- WDP
- PWI Stream
- River / Stream
- Waterbody
- NWI Wetland
- Photo Point
- Drainage Tile Inlet

N

0 500 1,000 2,000
Feet

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Appendix A – Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Marshall Solar City/County: Lyon County Sampling Date: 6/11/2014

Applicant/Owner: NextEra State: MN Sampling Point: WDP 1

Investigators: M Swenson B Adamich Section, Township, Range S 28 T 112 R 40

Landform (hillslope, terrace, etc.): Depression Local Relief (concave, convex, none): Concave

Slope(%): 0 Lat: 44.470941 Long: -95.66004 Datum: WGS 1984

Soil Map Unit Name: Arvilla-Storden-Ves complex, 6 to 15 percent slopes NWI Classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If No, explain in Remarks)

Are Vegetation X, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Plot is located within the boundary of an area identified as a potential wetland via offsite review. Plot is made up entirly of corn row crops, no indicators of hydric soils are present.

VEGETATION– Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
Zea mays	35	Y	UPL
	35 =Total Cover		
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	35	x 5 =	175
Column Totals:	35 (A)		175 (B)

Prevalence Index = B/A= 5.00

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation is comprised entiriely of row crops.

SOIL

Sampling Point: WDP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
0 to 6	10YR 2 / 1	100					CLAY LOAM	
6 to 19	10YR 4 / 3	95	10YR 5/6	5	C	M	CLAY	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
No indicators of hydric soils are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches):	_____
Water Table Present?	Yes	____	No	X	Depth (inches):	_____
Saturation Present?	Yes	____	No	X	Depth (inches):	_____

Wetland Hydrology Present? **Yes** ____ **No** X

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

Remarks:
Although drainage infrastructure is located onsite in the form of open tile inlets, it is unkown if lateral drains have been installed within the property. The plot is not located within the setback distance of any of the known drainage infrastructure. Therefore geomorphic position still applies.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Marshall Solar City/County: Lyon County Sampling Date: 6/11/2014

Applicant/Owner: NextEra State: MN Sampling Point: WDP 2

Investigators: M Swenson B Adamich Section, Township, Range S 28 T 112 R 40

Landform (hillslope, terrace, etc.): Depression Local Relief (concave, convex, none): Concave

Slope(%): 0 Lat: 44.477978 Long: -95.65922 Datum: WGS 1984

Soil Map Unit Name: Marysland Loam NWI Classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If No, explain in Remarks)

Are Vegetation X, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Plot is located within a drown out depression within a corn field. Recent rain falls most likely have caused ponded water within the corn field. No indicators of hydric soils nor hydrophytic vegetation were present, therefore this plot is not located within a wetland.

VEGETATION– Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
Zea mays	35	Y	UPL
	35 =Total Cover		
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	35	x 5 =	175
Column Totals:	35 (A)		175 (B)

Prevalence Index = B/A= 5.00

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WDP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
0 to 9	10YR 2 / 1	100					CLAY LOAM	
9 to 20	2.5Y 5 / 3	90	10YR 4/6	10	C	M	CLAY	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
No indicators of hydric soils are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	X		0.5
Water Table Present?		X	0
Saturation Present?		X	0

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:
Wetland hydrology is present in the form of suface water. Geomorphic position is not applicable as the wetland plot location is located within the setback distance of the drainage ditch as defined by the USDA NRCS Minnesota Drainage setback table for Lyon County.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Marshall Solar City/County: Lyon County Sampling Date: 6/11/2014

Applicant/Owner: NextEra State: MN Sampling Point: WDP 3

Investigators: M Swenson B Adamich Section, Township, Range S 28 T 112 R 40

Landform (hillslope, terrace, etc.): Depression Local Relief (concave, convex, none): Concave

Slope(%): 0 Lat: 44.47795 Long: -95.668655 Datum: WGS 1984

Soil Map Unit Name: Marysland loam NWI Classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If No, explain in Remarks)

Are Vegetation X, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Plot is located within a drown out depression within a corn field. Recent rain falls most likely have caused ponded water within the corn field. No indicators of hydric soils nor hydrophytic vegetation were present, therefore this plot is not located within a wetland.

VEGETATION– Use scientific names of plants.

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
Zea mays	35	Y	UPL
	35 =Total Cover		
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	35	x 5 =	175
Column Totals:	35 (A)		175 (B)

Prevalence Index = B/A= 5.00

Hydrophytic Vegetation Indicators:

____ Rapid Test for Hydrophytic Vegetation

____ Dominance Test > 50%

____ Prevalence Index ≤ 3.0

____ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Vegetation comprised entirely of row crops.

SOIL

Sampling Point: WDP 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc [2]	Texture	Remarks
0 to 15	10YR 2 / 1	100					CLAY LOAM	
15 to 22	10YR 5 / 3	90	10YR	10	C	M	CLAY	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils: [3]

- ☐ Coast Prairie Redox (A16)
- ☐ Iron-Manganese Masses (F12)
- ☐ Dark Surface (S7)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:
No indicators of hydric soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surf. (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	X	No	____	Depth (inches):	0.5
Water Table Present?	Yes	X	No	____	Depth (inches):	0
Saturation Present?	Yes	X	No	____	Depth (inches):	0

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:
Wetland hydrology is present in the form of suface water. Geomorphic position is not applicable as the wetland plot location is located within the setback distance of the drainage ditch as defined by the USDA NRCS Minnesota Drainage setback table for Lyon County.

Appendix B – Photo Log

Photo 1. WDP 1 –Orientation north west

Photo 2. WDP 2 – Orientation west

Photo 3. WDP 3 – Orientation northwest

Photo 4. Southern Drainage Feature – Orientation west

Photo 4. Northern Drainage Feature – Orientation west

Appendix C – Agency Correspondence

DEPARTMENT OF THE ARMY
St. Paul District, Corps of Engineers
180 Fifth Street East, Suite 700
St. Paul MN 55101-1678

REPLY TO
ATTENTION OF

DEC 05 2014

Operations
Regulatory (2014-04024-BGO)

Mr. Michael Swenson
HDR Engineering, Inc.
701 Xenia Avenue South, Suite 600
Minneapolis, Minnesota 55416

Dear Mr. Swenson:

This letter is in response to your correspondence dated November 11, 2014, requesting Corps of Engineers concurrence with the delineation of aquatic resources completed on the 505-acre Marshall Solar Energy Project property. The project site is located in Section 28 and 33, T. 112N., R. 40W., Lyon County, Minnesota.

We have reviewed the Marshall Solar Energy Project Delineation and we require more information before we are able to concur that the limits of the aquatic resources have been accurately identified in accordance with current agency guidance including the *Corps of Engineers Wetland Delineation Manual* (1987 Manual) and the Regional Supplement to the Corps of Engineers Wetland Delineation manual: Midwest Region.

The specific comments we have about the delineation include:

1. Page one of the delineation report correctly states that due to the site being cropped, normal circumstances are not present. However, the data sheets state that Normal Circumstances are present. The data sheets should be revised.
2. Under the aforementioned circumstances being not normal, an assessment of the vegetative community on-site was not necessary. It is recommended, but not required, that reference sites in reasonable proximity with vegetation under normal circumstances located on the same landscape position and soil type be used to characterize the vegetation that would "normally occur" in the cropped field where the samples were taken.
3. Hydric soil interpretations are now listed in WEB Soil Survey as 5 categories. Figure 2 should be resubmitted with a 5 category listing of hydric soil.
4. The locations of the observed open drainage inlets and drainage ditches should be indicated on a separate Figure.
5. The report cited the presence of drainage infrastructure. If the sample point is within the setback distance of functioning drainage infrastructure, hydrology indicator D2, geomorphic position, cannot be used. If D2 is used, documentation must be provided that a functioning drain is beyond the setback distance.

6. The location of the photographs should be noted on a Figure, such as Figure 4.

Please make note of the comments above and coordinate with the regulatory project manager listed below to further explain or evaluate this delineation. Based on this evaluation, we believe it will not be necessary to visit the project site during the growing season to evaluate the delineation.

In the interim, please be aware that pursuant to Section 404 of the Clean Water Act, the Corps of Engineers has regulatory jurisdiction over the discharge of dredged and fill materials, including discharges associated with mechanical land clearing, in all waters of the United States, which includes most wetlands. In addition, the Corps regulates all work in navigable waters of the United States pursuant to Section 10 of the Rivers and Harbors Act. Work performed below the ordinary high water mark in waters of the United States, or the discharge of dredged or fill material into wetlands, without a Department of the Army permit could subject you to enforcement action. Receipt of a permit from a state or local agency does not obviate the requirement for obtaining a Department of the Army permit.

If you have any questions, please contact Benjamin Orne in our St. Paul office at (651) 290-5280. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

Benjamin Orne

Benjamin Orne
Project Manager

cc:
Luke Olson, Lyon SWCD
Jennifer Field, NextEra Energy Resources, LLC

Swenson, Michael

From: Luke K. Olson <LukeOlson@co.lyon.mn.us>
Sent: Friday, November 21, 2014 8:47 AM
To: Swenson, Michael
Subject: Marshall Solar Application

HiMichael,

Ihavereview edtheapplicationanddeli neationmaterialsfortheMarshallSola rprojectandforwardedthesematerials ontoappropriatestaffwiththe BWSR,DNR,andAC OE.Th eprojectareahasadrainageditch (JD 18)r unningthrough theproperty.Thereportthatwas sentwasverythoroughbut didnothighlightwhether theditchmettherequired featuresofawetland. Thereport shouldaddressthewetland/upland statusintheditchaswell.

Ifyoucouldtakealooka tthisfor theTechnicalEvaluationPanel,thatwouldb egreat!Calloremailif youhaveany questionsonwhatIamloo kingfor.

Respectfully,

Luke Olson
ConservationP lanningTechni cian
LyonCountySWCD
1424ECollege Drive
Marshall,MN56258
Phone:507. 537.0396

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL MN 55101-1678

REPLY TO
ATTENTION OF

JAN 0 7 2015

Operations
Regulatory (2014-04024-BGO)

Mr. Michael Swenson
HDR Engineering, Inc.
701 Xenia Avenue South, Suite 600
Minneapolis, Minnesota 55416

Dear Mr. Swenson:

This letter is in response to your correspondence dated November 11, 2014, requesting Corps of Engineers (Corps) concurrence with the delineation of aquatic resources completed on the 505-acre Marshall Solar Energy Project property. The project site is located in Section 28 and 33, T. 112N., R. 40W., Lyon County, Minnesota.

We have reviewed the December 18, 2014 and January 7, 2015 updates to the Marshall Solar Energy Project Delineation and determined that the limits of the aquatic resources have been accurately identified in accordance with current agency guidance including the *Corps of Engineers Wetland Delineation Manual* (1987 Manual) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region. This concurrence is only valid for the study area shown on the attached Figure 1 of the report. The boundaries shown on the attached Figure 4 of the report accurately reflect the limits of the aquatic resources in the review area, which include part of Judicial Ditch 18 in the northern portion of the site and part of Judicial Ditch 34 in the southern portion of the site.

This concurrence may generally be relied upon for five years from the date of this letter. However, we reserve the right to review and revise our concurrence in response to changing site conditions, information that was not considered during our initial review, or off-site activities that could indirectly alter the extent of wetlands and other resources on-site. Our concurrence may be renewed at the end of this period provided you submit a written request and our staff are able to verify that the determination is still valid.

This review did **not** include a jurisdictional determination as to whether the aquatic resources identified at the site would be subject to Corps of Engineers jurisdiction under the Clean Water Act (CWA). Pursuant to Section 404 of the CWA, a Department of the Army permit is required for the discharge of dredged and fill material into a water of the United States. If you would like the Corps to make a determination regarding the status of the aquatic resources identified on the property you may request an approved jurisdictional determination by submitting a written request to me at the letterhead address.

Please note that the discharge of dredged or fill material into waters of the United States without a Department of the Army permit could subject you to enforcement action. Receipt of a permit from a state or local agency does not obviate the requirement for obtaining a Department of the Army permit.

Thank you for your cooperation with the U.S. Army Corps of Engineers regulatory program. If you have any questions, please contact me at (651) 290-5280. In any correspondence or inquiries, please refer to the Regulatory number shown above.

Sincerely,

Benjamin Orne
Project Manager

cc:
Luke Olson, Lyon SWCD
Jennifer Field, NextEra Energy Resources, LLC

Minnesota Wetland Conservation Act
Notice of Application

Local Government Unit (LGU)	Address
Lyon SWCD	**1424 E College Dr, Suite 600** **Marshall, MN 56258**

1. PROJECT INFORMATION

Applicant Name	Project Name	Date of Application	Application Number
Marshall Solar, LLC	**Marshall Solar Energy Project**	**11/12/2014**	**2014-03**

Type of Application (check all that apply):

☐ Wetland Boundary or Type ☒ No-Loss ☐ Exemption ☐ Sequencing
☐ Replacement Plan ☐ Banking Plan

Summary and description of proposed project (attach additional sheets as necessary):

Marshall Solar, LLC has submitted a plan and wetland delineations for the proposed Marshall Solar Facility. The proposed project is located in Sections 28 and 33, T112N R40W (Stanley Twp), Lyon County, MN. The site is approximately four miles east of the City of Marshall.

The project would involve developing a utility scale photovoltaic solar facility and associated infrastructure. HDR Engineering, the project agent, performed a historical aerial photography review and on-site review which identified no wetlands within the study area.

2. APPLICATION REVIEW AND DECISION

Signing and mailing of this completed form to the appropriate recipients in accordance with 8420.0255, Subp. 3 provides notice that an application was made to the LGU under the Wetland Conservation Act as specified above. A copy of the application is attached. Comments can be submitted to:

Name and Title of LGU Contact Person	Comments must be received by (minimum 15 business-day comment period):
Luke Olson **Conservation Technician, Lyon SWCD**	**12/15/2014**
Address (if different than LGU)	Date, time, and location of decision: **12/15/2014, 4:30pm** **Lyon SWCD**
Phone Number and E-mail Address **(507)537-0396x3** **lukeolson@co.lyon.mn.us**	Decision-maker for this application: ☒ Staff ☐ Governing Board or Council

Signature: Luke L. Olson **Date:** 11-18-2014

3. LIST OF ADDRESSEES

- ☒ SWCD TEP member: **Luke Olson**
- ☒ BWSR TEP member: **Kane Radel**
- ☒ LGU TEP member (if different than LGU Contact): **Todd Hammer**
- ☒ DNR TEP member: **Lucas Youngsma**
- ☐ DNR Regional Office (if different than DNR TEP member)
- ☐ WD or WMO (if applicable):
- ☐ Applicant (notice only) and Landowner (if different)
- ☐ Members of the public who requested notice (notice only):
- ☐ Corps of Engineers Project Manager (notice only)
- ☐ BWSR Wetland Bank Coordinator (wetland bank plan applications only)

4. MAILING INFORMATION

➢For a list of BWSR TEP representatives: www.bwsr.state.mn.us/contact/WCA_areas.pdf

➢For a list of DNR TEP representatives: www.bwsr.state.mn.us/wetlands/wca/DNR_TEP_contacts.pdf

➢Department of Natural Resources Regional Offices:

NW Region:	NE Region:	Central Region:	Southern Region:
Reg. Env. Assess. Ecol.	Reg. Env. Assess. Ecol.	Reg. Env. Assess. Ecol.	Reg. Env. Assess. Ecol.
Div. Ecol. Resources	Div. Ecol. Resources	Div. Ecol. Resources	Div. Ecol. Resources
2115 Birchmont Beach Rd. NE	1201 E. Hwy. 2	1200 Warner Road	261 Hwy. 15 South
Bemidji, MN 56601	Grand Rapids, MN 55744	St. Paul, MN 55106	New Ulm, MN 56073

For a map of DNR Administrative Regions, see: http://files.dnr.state.mn.us/aboutdnr/dnr_regions.pdf

➢For a list of Corps of Project Managers: www.mvp.usace.army.mil/regulatory/default.asp?pageid=687
or send to:

➢

US Army Corps of Engineers
St. Paul District, ATTN: OP-R
180 Fifth St. East, Suite 700
St. Paul, MN 55101-1678

➢For Wetland Bank Plan applications, also send a copy of the application to:

Minnesota Board of Water and Soil Resources
Wetland Bank Coordinator
520 Lafayette Road North
St. Paul, MN 55155

5. ATTACHMENTS

In addition to the application, list any other attachments:

- ☒ **Joint Application**
- ☒ **Wetland Delineation Technical Memorandum**
- ☐
- ☐
- ☐

Joint Application Form for Activities Affecting Water Resources in Minnesota

This joint application form is the accepted means for initiating review of proposals that may affect a water resource (wetland, tributary, lake, etc.) in the State of Minnesota under state and federal regulatory programs. Applicants for Minnesota Department of Natural Resources (DNR) Public Waters permits **MUST** use the MPARS online permitting system for submitting applications to the DNR. Applicants can use the information entered into MPARS to substitute for completing parts of this joint application form (see the paragraph on MPARS at the end of the joint application form instructions for additional information). This form is only applicable to the water resource aspects of proposed projects under state and federal regulatory programs; other local applications and approvals may be required. Depending on the nature of the project and the location and type of water resources impacted, multiple authorizations may be required as different regulatory programs have different types of jurisdiction over different types of resources.

Regulatory Review Structure

Federal

The St. Paul District of the U.S. Army Corps of Engineers (Corps) is the federal agency that regulates discharges of dredged or fill material into waters of the United States (wetlands, tributaries, lakes, etc.) under Section 404 of the Clean Water Act (CWA) and regulates work in navigable waters under Section 10 of the Rivers and Harbors Act. Applications are assigned to Corps project managers who are responsible for implementing the Corps regulatory program within a particular geographic area.

State

There are three state regulatory programs that regulate activities affecting water resources. The Wetland Conservation Act (WCA) regulates most activities affecting wetlands. It is administered by local government units (LGUs) which can be counties, townships, cities, watershed districts, watershed management organizations or state agencies (on state-owned land). The Minnesota DNR Division of Ecological and Water Resources issues permits for work in specially-designated public waters via the Public Waters Work Permit Program (DNR Public Waters Permits). The Minnesota Pollution Control Agency (MPCA) under Section 401 of the Clean Water Act certifies that discharges of dredged or fill material authorized by a federal permit or license comply with state water quality standards. One or more of these regulatory programs may be applicable to any one project.

Required Information

Prior to submitting an application, applicants are **strongly encouraged** to seek input from the Corps Project Manager and LGU staff to identify regulatory issues and required application materials for their proposed project. Project proponents can request a pre-application consultation with the Corps and LGU to discuss their proposed project by providing the information required in Sections 1 through 5 of this joint application form to facilitate a meaningful discussion about their project. Many LGUs provide a venue (such as regularly scheduled technical evaluation panel meetings) for potential applicants to discuss their projects with multiple agencies prior to submitting an application. Contact information is provided below.

The following bullets outline the information generally required for several common types of determinations/authorizations.

- For delineation approvals and/or jurisdictional determinations, submit Parts 1, 2 and 5, and Attachment A.
- For activities involving CWA/WCA exemptions, WCA no-loss determinations, and activities not requiring mitigation, submit Parts 1 through 5, and Attachment B.
- For activities requiring compensatory mitigation/replacement plan, submit Parts 1 thru 5, and Attachments C and D.
- For local road authority activities that qualify for the state's local road wetland replacement program, submit Parts 1 through 5, and Attachments C, D (if applicable), and E to both the Corps and the LGU.

Submission Instructions

Send the completed joint application form and all required attachments to:

U.S Army Corps of Engineers. Applications may be sent directly to the appropriate Corps Office. For a current listing of areas of responsibilities and contact information, visit the St. Paul District's website at: http://www.mvp.usace.army.mil/Missions/Regulatory.aspx and select "Minnesota" from the contact Information box. Alternatively, applications may be sent directly to the St. Paul District Headquarters and the Corps will forward them to the appropriate field office.

Section 401 Water Quality Certification: Applicants do not need to submit the joint application form to the MPCA unless specifically requested. The MPCA will request a copy of the completed joint application form directly from an applicant when they determine an individual 401 water quality certification is required for a proposed project.

Wetland Conservation Act Local Government Unit: Send to the appropriate Local Government Unit. If necessary, contact your county Soil and Water Conservation District (SWCD) office or visit the Board of Water and Soil Resources (BWSR) web site (www.bwsr.state.mn.us) to determine the appropriate LGU.

DNR Public Waters Permitting: In 2014 the DNR will begin using the Minnesota DNR Permitting and Reporting System (MPARS) for submission of Public Waters permit applications (https://webapps11.dnr.state.mn.us/mpars/public/authentication/login). Applicants for Public Waters permits **MUST** use the MPARS online permitting system for submitting applications to the DNR. To avoid duplication and to streamline the application process among the various resource agencies, applicants can use the information entered into MPARS to substitute for completing parts of this joint application form. The MPARS print/save function will provide the applicant with a copy of the Public Waters permit application which, at a minimum, will satisfy Parts one and two of this joint application. For certain types of activities, the MPARS application may also provide all of the necessary information required under Parts three and four of the joint application. However, it is the responsibility of the Applicant to make sure that the joint application contains all of the required information, including identification of all aquatic resources impacted by the project (see Part four of the joint application). After confirming that the MPARS application contains all of the required information in Parts one and two the Applicant may attach a copy to the joint application and fill in any missing information in the remainder of the joint application.

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name: Marshall Solar, LLC
Mailing Address: 700 Universe Boulevard, Mailstop FBD-JB, Juno Beach, FL 33408
Phone: 561-304-5775
E-mail Address: Brandon.stankiewicz@nee.com

Authorized Contact (do not complete if same as above): Brandon Stankiewicz – Director
Mailing Address:
Phone:
E-mail Address:

Agent Name: **HDR - Michael Swenson**
Mailing Address: **701 Xenia Ave S. Suite 600**
Phone: **763-278-5946**
E-mail Address: **michael.swenson@hdrinc.com**

PART TWO: Site Location Information

County: **Lyon** **City/Township:** **Stanly Township**
Parcel ID and/or Address: **NA**
Legal Description (Section, Township, Range): **Sections 28 and 33 Range 40W Township 112N**
Lat/Long (decimal degrees): **NA**
Attach a map showing the location of the site in relation to local streets, roads, highways.
Approximate size of site (acres) or if a linear project, length (feet): **504**

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource** [3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]

[1]If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: _____ Date:

I hereby authorize **HDR** to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

_____

[1] The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.

Attachment A
Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

By submission of the enclosed wetland delineation report, I am requesting that the U.S. Army Corps of Engineers, St. Paul District (Corps) and/or the Wetland Conservation Act Local Government Unit (LGU) provide me with the following (check all that apply):

☐ **Wetland Type Confirmation**

☒ **Delineation Concurrence**. Concurrence with a delineation is a written notification from the Corps and a decision from the LGU concurring, not concurring, or commenting on the boundaries of the aquatic resources delineated on the property. Delineation concurrences are generally valid for five years unless site conditions change. Under this request alone, the Corps will not address the jurisdictional status of the aquatic resources on the property, only the boundaries of the resources within the review area (including wetlands, tributaries, lakes, etc.).

☐ **Preliminary Jurisdictional Determination**. A preliminary jurisdictional determination (PJD) is a non-binding written indication from the Corps that waters, including wetlands, identified on a parcel may be waters of the United States. For purposes of computation of impacts and compensatory mitigation requirements, a permit decision made on the basis of a PJD will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. PJDs are advisory in nature and may not be appealed.

☐ **Approved Jurisdictional Determination**. An approved jurisdictional determination (AJD) is an official Corps determination that jurisdictional waters of the United States are either present or absent on the property. AJDs can generally be relied upon by the affected party for five years. An AJD may be appealed through the Corps administrative appeal process.

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).
http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit (LGU)	Address
Lyon SWCD	**1424 E College Dr, Suite 600** **Marshall, MN 56258**

1. PROJECT INFORMATION

Applicant Name	Project Name	Date of Application	Application Number
Marshall Solar, LLC	**Marshall Solar Energy Project**	**11/12/2014**	**2014-03**

☐ Attach site locator map.

Type of Decision:

☒ Wetland Boundary or Type ☒ No-Loss ☐ Exemption ☐ Sequencing
☐ Replacement Plan ☐ Banking Plan

Technical Evaluation Panel Findings and Recommendation (if any):

☐ Approve ☐ Approve with conditions ☐ Deny

Summary (or attach):

2. LOCAL GOVERNMENT UNIT DECISION

Date of Decision: **1/26/2015**

☒ Approved ☐ Approved with conditions (include below) ☐ Denied

LGU Findings and Conclusions (attach additional sheets as necessary):

The "Wetland Delineation Technical Memorandum," submitted by HDR Engineering, Inc. on behalf of Marshall Sollar LLC (Applicant) concludes that the project area does not contain any areas meeting the technical definition of a wetland, including the two perennial drainage ditches.

Christina Rolfes with HDR Engineering Inc reassured that the construction concept plans highlights that the current ditch system will not be manipulated nor will the setback from the ditches be violated. With this in mind, the wetland delineation appears adequate at addressing the proposed project and current wetland site conditions.

For Replacement Plans using credits from the State Wetland Bank:

Bank Account #	Bank Service Area	County	Credits Approved for Withdrawal (sq. ft. or nearest .01 acre)

Replacement Plan Approval Conditions. In addition to any conditions specified by the LGU, the approval of a Wetland Replacement Plan is conditional upon the following:

☐ **Financial Assurance:** For project-specific replacement that is not in-advance, a financial assurance specified by the LGU must be submitted to the LGU in accordance with MN Rule 8420.0522, Subp. 9 (List amount and type in LGU Findings).

☐ **Deed Recording:** For project-specific replacement, evidence must be provided to the LGU that the BWSR "Declaration of Restrictions and Covenants" and "Consent to Replacement Wetland" forms have been filed with the county recorder's office in which the replacement wetland is located.

☐ **Credit Withdrawal:** For replacement consisting of wetland bank credits, confirmation that BWSR has withdrawn the credits from the state wetland bank as specified in the approved replacement plan.

Wetlands may not be impacted until all applicable conditions have been met!

LGU Authorized Signature:

Signing and mailing of this completed form to the appropriate recipients in accordance with 8420.0255, Subp. 5 provides notice that a decision was made by the LGU under the Wetland Conservation Act as specified above. If additional details on the decision exist, they have been provided to the landowner and are available from the LGU upon request.		
Name **Luke Olson**	Title **Conservation Technician**	
Signature Luke K. Olson	Date **1/26/2015**	Phone Number and E-mail **507-537-0396 x3 (Direct)** **lukeolson@co.lyon.mn.us**

THIS DECISION ONLY APPLIES TO THE MINNESOTA WETLAND CONSERVATION ACT. Additional approvals or permits from local, state, and federal agencies may be required. Check with all appropriate authorities before commencing work in or near wetlands.

Applicants proceed at their own risk if work authorized by this decision is started before the time period for appeal (30 days) has expired. If this decision is reversed or revised under appeal, the applicant may be responsible for restoring or replacing all wetland impacts.

This decision is valid for three years from the date of decision unless a longer period is advised by the TEP and specified in this notice of decision.

3. APPEAL OF THIS DECISION

Pursuant to MN Rule 8420.0905, any appeal of this decision can only be commenced by mailing a petition for appeal, including applicable fee, within thirty (30) calendar days of the date of the mailing of this Notice to the following as indicated:

Check one:

☐ Appeal of an LGU staff decision. Send petition and $_____ fee (if applicable) to:	☒ Appeal of LGU governing body decision. Send petition and $500 filing fee to: Executive Director Minnesota Board of Water and Soil Resources 520 Lafayette Road North St. Paul, MN 55155

4. LIST OF ADDRESSEES

- ☒ SWCD TEP member: **Luke Olson**
- ☒ BWSR TEP member: **Kane Radel**
- ☒ LGU TEP member (if different than LGU Contact): **Todd Hammer**
- ☒ DNR TEP member: **Lucas Youngsma**
- ☐ DNR Regional Office (if different than DNR TEP member)
- ☐ WD or WMO (if applicable):
- ☐ Applicant and Landowner (if different)
- ☐ Members of the public who requested notice:

- ☒ Corps of Engineers Project Manager
- ☐ BWSR Wetland Bank Coordinator (wetland bank plan decisions only)

5. MAILING INFORMATION

➢ For a list of BWSR TEP representatives: www.bwsr.state.mn.us/aboutbwsr/workareas/WCA_areas.pdf

➢ For a list of DNR TEP representatives: www.bwsr.state.mn.us/wetlands/wca/DNR_TEP_contacts.pdf

➢ Department of Natural Resources Regional Offices:

NW Region:	NE Region:	Central Region:	Southern Region:
Reg. Env. Assess. Ecol. Div. Ecol. Resources 2115 Birchmont Beach Rd. NE Bemidji, MN 56601	Reg. Env. Assess. Ecol. Div. Ecol. Resources 1201 E. Hwy. 2 Grand Rapids, MN 55744	Reg. Env. Assess. Ecol. Div. Ecol. Resources 1200 Warner Road St. Paul, MN 55106	Reg. Env. Assess. Ecol. Div. Ecol. Resources 261 Hwy. 15 South New Ulm, MN 56073

For a map of DNR Administrative Regions, see: http://files.dnr.state.mn.us/aboutdnr/dnr_regions.pdf

➢ For a list of Corps of Project Managers: www.mvp.usace.army.mil/regulatory/default.asp?pageid=687 or send to:

US Army Corps of Engineers
St. Paul District, ATTN: OP-R
180 Fifth St. East, Suite 700
St. Paul, MN 55101-1678

➢ For Wetland Bank Plan applications, also send a copy of the application to:

Minnesota Board of Water and Soil Resources
Wetland Bank Coordinator
520 Lafayette Road North
St. Paul, MN 55155

6. ATTACHMENTS

In addition to the site locator map, list any other attachments:

- ☐
- ☐
- ☐
- ☐
- ☐

Minnesota Department of Natural Resources

Division of Ecological and Water Resources

Southern Region • 261 Highway 15 South • New Ulm, MN 56073

Phone: 507-359-6073 Email: kevin.mixon@state.mn.us

December 11, 2014

Brandon Stankiewicz
NextEra Energy Resources, LLC
700 Universe Boulevard FED/JB
Juno Beach, FL 33408

Subject: Marshall Solar Energy Project
Preliminary Review
Lyon County, Minnesota

Dear Brandon:

The Minnesota Department of Natural Resources (DNR) appreciates the opportunity to review and comment on the Marshall Solar Energy Project located in Lyon County, MN. We also appreciate your early coordination with our agency and the productive meeting that our staff attended on December 10, 2014 in St. Paul, Minnesota. The DNR has reviewed the project and would like to provide the following recommendations.

The project area consists of agricultural land that does not contain any high value wildlife habitat. As such, the DNR does not recommend any pre-construciton wildlife surveys for the project. However, the DNR is interested in reviewing the post-construction wildlife monitoring that your company has used on other projects. Further discussion on post-construction monitoring can occur as the project moves forward.

An opportunity is available to manage vegetation at the project site as restored short-grass prairie or meadows. The DNR encourages solar developers to plant native seed that contains grasses and flowering forbs that are beneficial to wildlife, including pollinators. Please contact Megan Benage, DNR Regional Ecologist, at (507) 359-6079 if you would like to discuss the establishment or management of restored prairie at your solar site.

Establishing restored prairie on prior farmed land can provide the following conservation benefits: improve water quality by reducing soil erosion and soil water retention, improve soil composition and structure with the extensive root systems of prairie plants, result in reduced applications of fertilizer and herbicides, and provide critical habitat for pollinators and other wildlife. These are just a few ways the newly restored prairie can help offset natural resource impacts that may result from a solar project.

Please contact Lisa Joyal, Endangered Species Review Coordinator, at (651) 259-5109 in regards to your review and conclusions concerning potential impacts to rare features tracked in the Natural Heritage Inventory System (NHIS). The DNR can provide a concurrence response if we agree with your assessment of potential impacts to rare features.

The DNR suggests that in areas with high deer populations the fencing be eight-feet high to ensure that deer do not attempt to jump the fence. Barbed wire should not be used on six-foot high fencing because deer will attempt to jump shorter fences and can get entangled in the barbed wire. The result is injuries to the deer, fence repairs, and poor public relations for the operator of the solar project.

Please contact me directly at (507) 359-6073 if you have any questions or concerns about this letter.

Sincerely,

Kevin Mixon
Regional Environmental Assessment Ecologist
Southern Region

ec: Megan Benage, Regional Ecologist
Jamie Schrenzel, Principal Planner
Lisa Joyal, Endangered Species Review Coordinator
Wendy Krueger, Area Wildlife Manager
Jim Sehl, EWR Assistant Manager
Skip Wright, EWR North District Manager
Suzanne Steinhauer, EERA/DOC
ERDB#20150148

Rolfes, Christina

From: Joyal, Lisa (DNR) <Lisa.Joyal@state.mn.us>
Sent: Friday, January 16, 2015 11:14 AM
To: Rolfes, Christina
Cc: BRANDON.STANKIEWICZ@nexteraenergy.com; JENNIFER.FIELD@nexteraenergy.com; DeRuyter, Michael; Schrenzel, Jamie (DNR); Mixon, Kevin (DNR)
Subject: Marshall Solar Energy Facility - NHIS Concurrence
Attachments: MarshallSolar_NHIS.PDF

I have reviewed the attached assessment of the potential for the above project to impact rare features, and concur with your assessment that impacts to known occurrences of rare features are not anticipated.

The correspondence number for this response is ERDB #20150148.

Thank you,

Lisa Joyal

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Lisa Joyal
Endangered Species Review Coordinator
NHIS Data Distribution Coordinator
Division of Ecological and Water Resources
Minnesota Department of Natural Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155

phone: 651-259-5109
lisa.joyal@state.mn.us
www.mndnr.gov/eco

From: Rolfes, Christina
Sent: Tuesday, December 16, 2014 4:07 PM
To: Joyal, Lisa (DNR); Mixon, Kevin (DNR)
Cc: BRANDON.STANKIEWICZ@nexteraenergy.com; JENNIFER.FIELD@nexteraenergy.com; DeRuyter, Michael
Subject: Marshall Solar Energy Facility - NHIS Concurrence

Lisa,
NextEra Energy Resources is proposing to construct a 62.25 MW solar facility in Lyon County, Minnesota. Last week, NextEra, Kevin Mixon, and DOC staff met to discuss the project. It was recommended that I contact you to verify that our NHIS information and interpretation is accurate. I've attached a figure that shows the nearest NHIS hits to the project area. Here is our interpretation:

Three state-designated habitats or known occurrences of threatened, endangered, or special concern species occur within five miles of the study area. An animal assemblage (colonial waterbird nesting area) occurs approximately two miles north of the study area, a vertebrate animal occurrence (northern grasshopper mouse – special concern) approximately 4 miles north of the study area in Stanley Township, and an additional vertebrate animal occurrence
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

(burrowing owl - endangered) approximately two miles southeast of the study area in Clifton Township. Given that the project area is almost entirely agricultural, it is unlikely that habitat for federal and state-listed species exists.

The NHIS data is from July 2014.

Please let us know if you concur with our interpretation. Thank you!

Christina Rolfes
Environmental Scientist

HDR
701 Xenia Avenue South | Suite 600
Minneapolis, MN 55416

hdrinc.com/follow-us

Rolfes, Christina

From: Kelly Gragg-Johnson <kelly.graggjohnson@mnhs.org>
Sent: Tuesday, December 02, 2014 2:01 PM
To: Justin, Michael
Cc: sarah.beimers@mnhs.org; Rolfes, Christina
Subject: Re: NextEra proposed Marshall solar facility

Categories: Important

Hi Mike and Christina-
Thanks for the email. We don't believe a meeting is necessary at this time. This seems like a pretty straight forward project. We will review the results of the Phase IA lit search and any recommendations that come out of that, once it becomes available, and the results of any Phase I survey, if deemed warranted. If there are any big concerns as a result of the surveys and further consultation is needed, we would be happy to meet at that time. Meanwhile, we look forward to reviewing the results of the Phase IA and any pending Phase I surveys as they become available.
Best,
Kelly

Kelly Gragg-Johnson, Review & Compliance Specialist
Government Programs & Compliance | State Historic Preservation Office
Minnesota Historical Society | 345 Kellogg Blvd W | St. Paul, MN 55102
tel: 651.259.3455 | fax: 651.282.2374 | e: kelly.graggjohnson@mnhs.org

December 30, 2014

[redacted]

RE: Marshall Solar Energy Project – Open House

Dear [redacted]

Marshall Solar, LLC ("Marshall Solar"), a wholly owned subsidiary of NextEra Energy Resources, LLC is in the early planning stages for the development of the Marshall Solar Energy Project, an approximately 62 megawatt ("AC") solar photovoltaic facility located in Lyon County, Minnesota. The Project's output will be delivered to Northern States Power, an Xcel Energy subsidiary, to further Xcel Energy's commitment to the state of Minnesota to produce 1.5% of its energy from solar power.

Key facts about the project include:

- The Marshall Solar Project will be one of the first utility-scale solar facilities in Minnesota
- The Project will be located on privately owned agricultural land, approximately 5-miles east of Marshall, Minnesota in Stanley Township.
- The Project will interconnect to the electrical transmission system at the adjacent Lyon County Substation via a short, overhead electrical transmission line.
- The Project is expected to reach commercial operation by December 2016.
- Marshall Solar is in the process of completing various studies and expects to submit a Site Permit Application to the Minnesota Public Utilities Commission in early 2015.

Enclosed with this letter is a map depicting the proposed Project location. We invite you to join us at an open-house meeting in the town of Marshall, Minnesota. The open house will provide an opportunity for the project team to introduce ourselves, provide an overview of the proposed project, answer questions, and collect input from members of the community to better inform our permitting efforts. The open house will be an informal event and provide an opportunity for one-on-one conversations with our subject matter experts. There will be no formal presentation and you are welcome to attend anytime during the hours listed below. Refreshments will also be available.

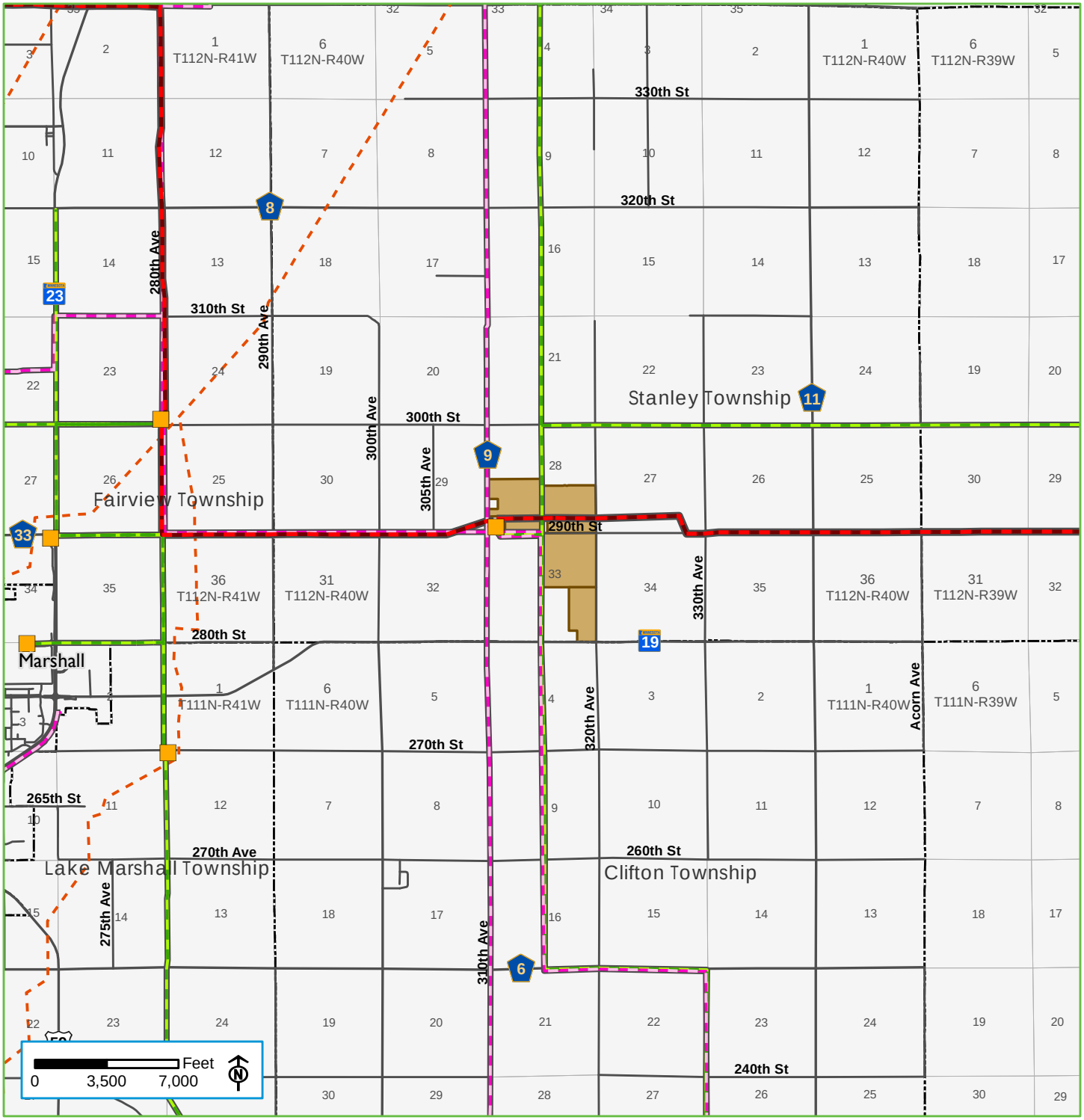
The open house will be held at the Marshall-Lyon County Library, which is located at 201 C Street in Marshall, MN from **4-6pm on Wednesday January 14, 2015**. For additional information, please send us an email at marshallsolarproject@gmail.com or call [redacted].

Respectfully,

Brandon Stankiewicz
Director, Development

Marshall Solar Facility
Lyon County, Minnesota

Figure 1
Project Overview and Infrastructure



Legend

- Study Area
- City / Township Boundary
- Section Line

Existing Transmission

- 69kV AC
- 115kV AC
- 345kV AC
- Substation
- Pipeline

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Marshall Solar Energy Project

Marshall Solar, LLC, a wholly owned subsidiary of NextEra Energy Resources, LLC is developing a 62.25 megawatt solar photovoltaic facility in Lyon County. This project will be one of the first utility-scale solar facilities in Minnesota. Energy from the project will be delivered to Northern States Power, a subsidiary of Xcel Energy, to further Xcel's commitment to the state of Minnesota to produce 1.5% of its energy from solar power.

Please join us at our open house meeting.

The open house will provide a project overview and an opportunity to collect input from members of the community to better inform our permitting efforts. There will be no formal presentation and you are welcome to attend anytime during the hours listed below. Refreshments will also be available.

Date & Time

Wednesday, January 14, 2015
4:00 - 6:00 pm

Location

Marshall-Lyon County Library
201 C Street | Marshall, MN

Questions? Email marshallsolarproject@gmail.com

Fact Sheet

Marshall Solar Energy Project

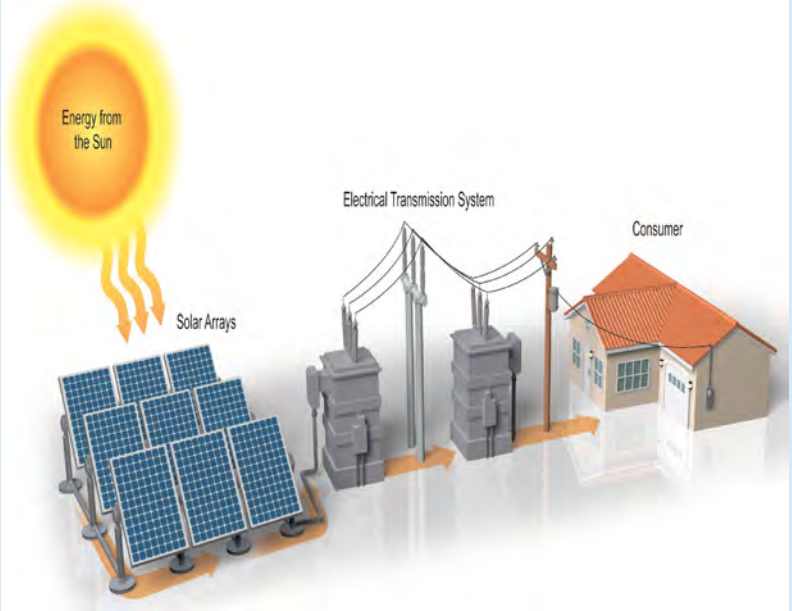
Photovoltaic solar is a proven technology planned for use at the proposed Marshall Solar Energy Project. As seen above, the technology is in use at the Paradise Solar Energy Center in New Jersey, which is owned and operated by NextEra Energy Resources.

About NextEra Energy Resources

- A leading clean energy provider operating wind, natural gas, solar and nuclear power plants
- A portfolio of power generating facilities across the United States and in Canada
- The largest wind generator in North America
- A subsidiary of NextEra Energy, Inc., with headquarters in Juno Beach, Florida
- Approximately 95 percent of our electricity comes from clean or renewable sources
- Visit us at www.NextEraEnergyResources.com

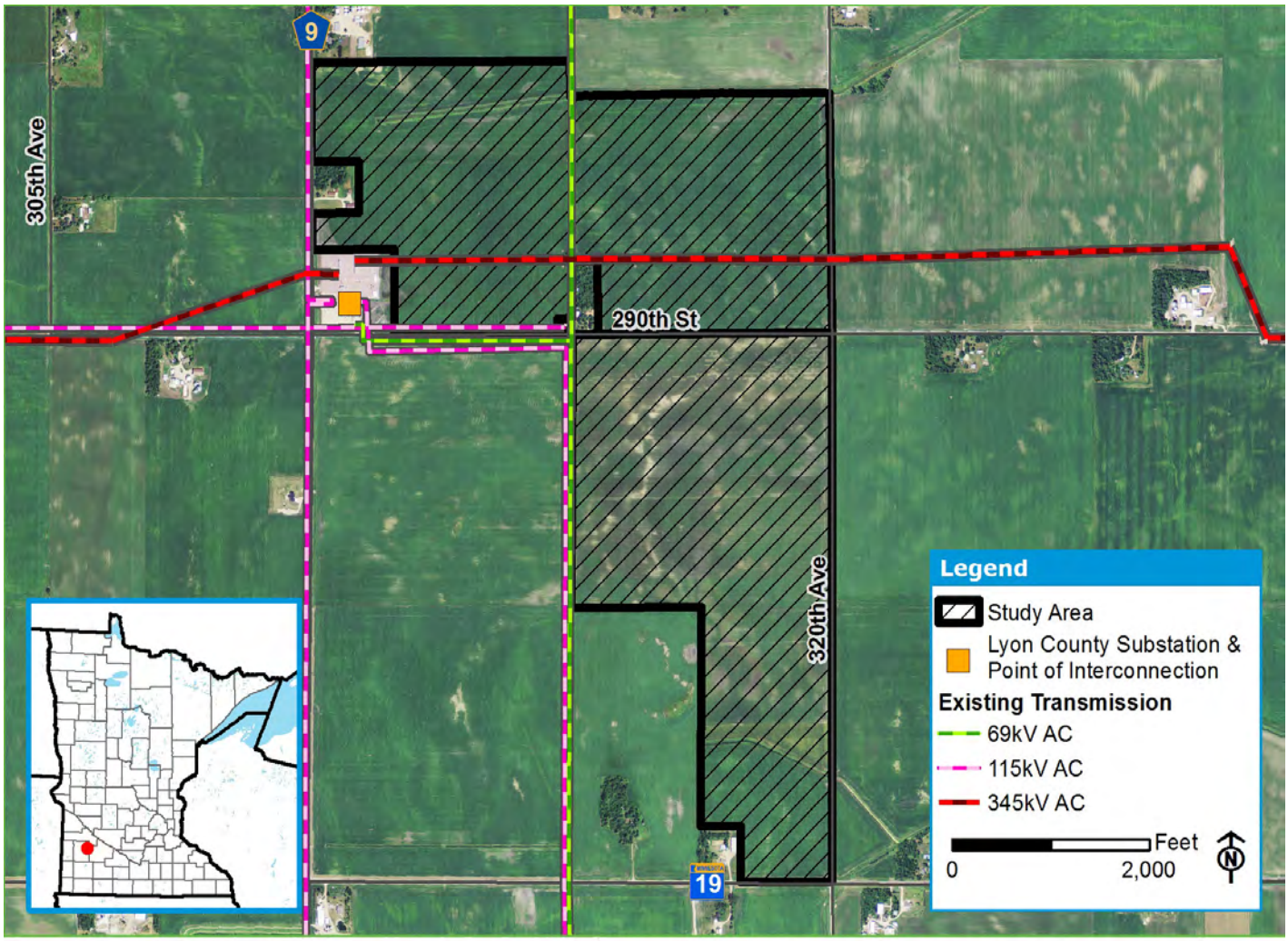
How the Marshall Solar Energy Project Will Work

As sunlight hits the solar panels, the solar radiation is converted into direct current (DC) electricity. The direct current flows into power inverters, where it is converted into alternating current (AC), which can be used by local electric utilities. Finally, the electricity travels through transformers, and the voltage is boosted for delivery onto the transmission grid for local electric utilities to distribute the electricity to homes and businesses.



Overview

- Located in Lyon County, 6 miles northeast of Marshall, Minnesota
- A proposed 62.25-megawatt photovoltaic solar energy generating facility, using monocrystalline solar panels
- Capable of generating enough electricity to power approximately 15,000 homes
- Will be built, owned and operated by Marshall Solar, LLC, a subsidiary of NextEra Energy Resources, LLC
- The project will be developed on approximately 460 acres of privately owned land
- Will avoid approximately 87,000 tons of carbon dioxide emissions that would have been produced if the electricity had been generated using fossil fuels
- Proposed interconnection with the existing Lyon County Substation



The proposed location for the Marshall Solar Energy Project near Marshall, Minnesota

Benefits

» Safe, clean and reliable power for Minnesota
» Local employment opportunities
  -- peak construction, close to 250 workers; average workforce of approximately 150 construction workers
  -- once operational, 2-3 full-time employees
» Economic stimulus
  -- facility payroll
  -- increased purchases of local goods and services during construction and long-term operation
  -- increased sales tax revenue
  -- additional demand for local housing

Permitting

The Minnesota Public Utilities Commission will take primary jurisdiction over this project via the site permit process. Marshall Solar, LLC (a subsidiary of NextEra Energy Resources) will file the permit application in February 2015.

As of December 2014

Welcome!

The purpose of this meeting is to:

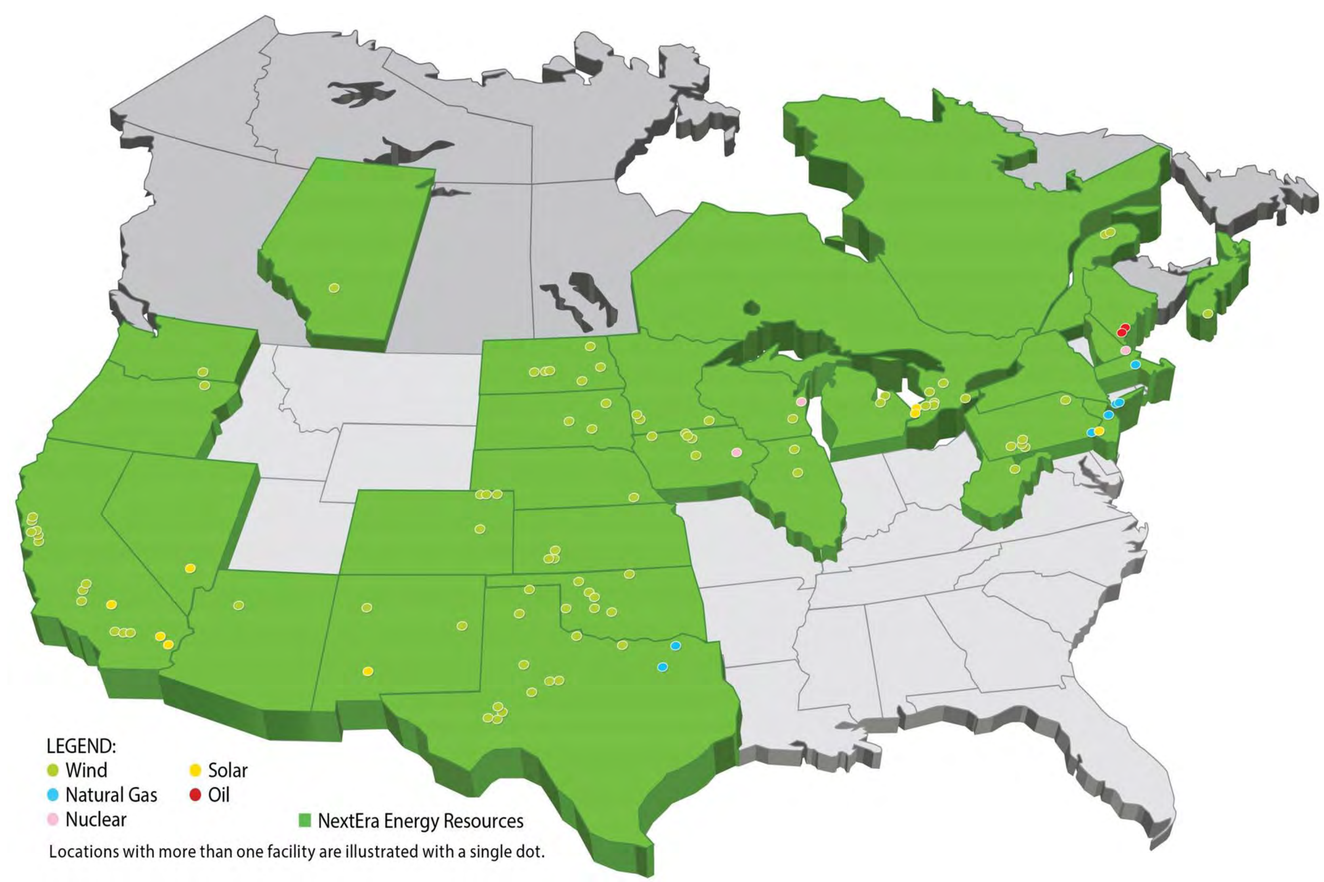
- Provide information about the project
- Answer your questions
- Gather your input!

Who is NextEra Energy?

- One of the largest electric power companies in the the U.S. comprised of two main subsidiaries (Florida Power and Light & NextEra Energy Resources)

- U.S. leader in renewable energy generation with over 11,000 MW of wind energy.

- Largest solar operator in the U.S. with 477 MW of solar energy operational and an additional 800 MW in development through 2016.



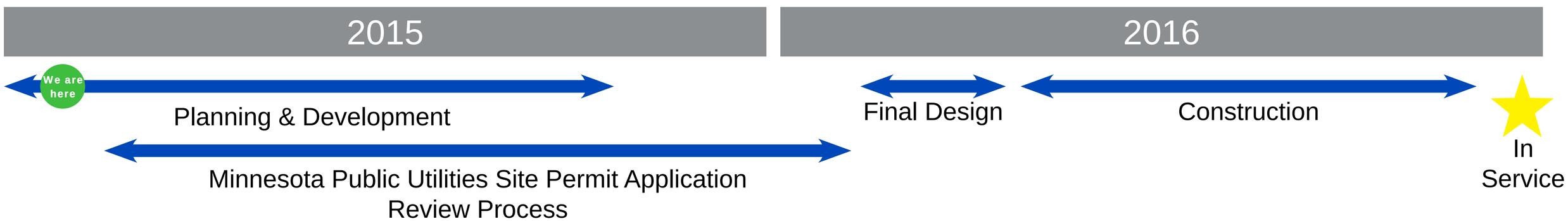
Project Overview

- 62.25 MW (ac) photovoltaic facility
- 500-acre property will be purchased and owned by NextEra. Current land almost entirely in agricultural usage
- Project site is adjacent to Xcel Energy's Lyon County Substation
- Project will further Xcel Energy's commitment to the state of Minnesota to produce 1.5% of its energy from solar power

Benefits

- Safe, clean, and reliable power for Minnesota
- Generate enough electricity to power approximately 15,000 homes
- Up to 250 workers during peak construction
- 2-3 full-time employees during operation
- Economic stimulus during construction from facility payroll, purchase of local goods and services, and sales tax revenue
- Increase in property taxes paid to the county and township

Project Timeline



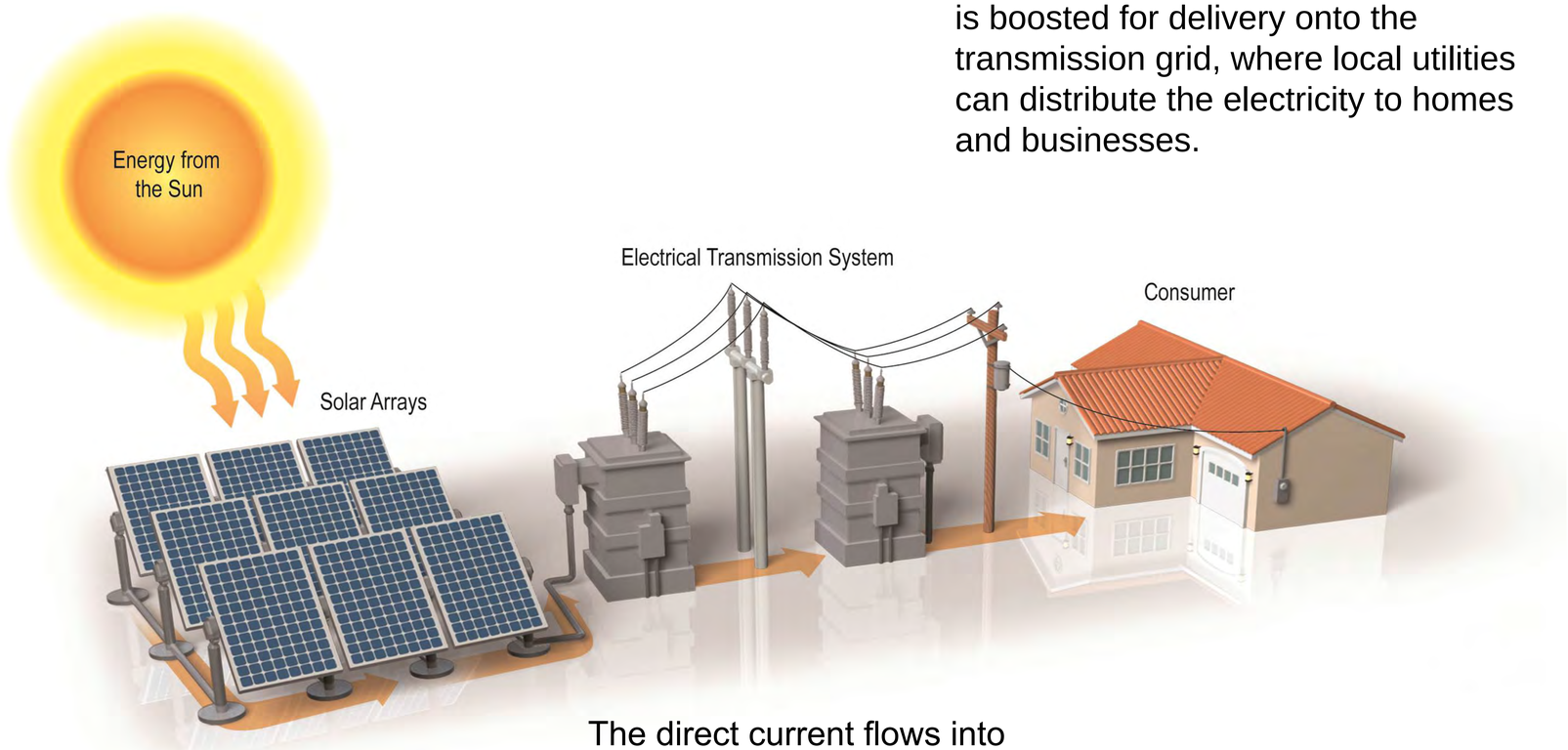
How Photovoltaic Solar Energy Works

Solar panels turn light from the sun to generate electricity through a conversion process called photovoltaic effect.

Solar Panel

Power Inveter

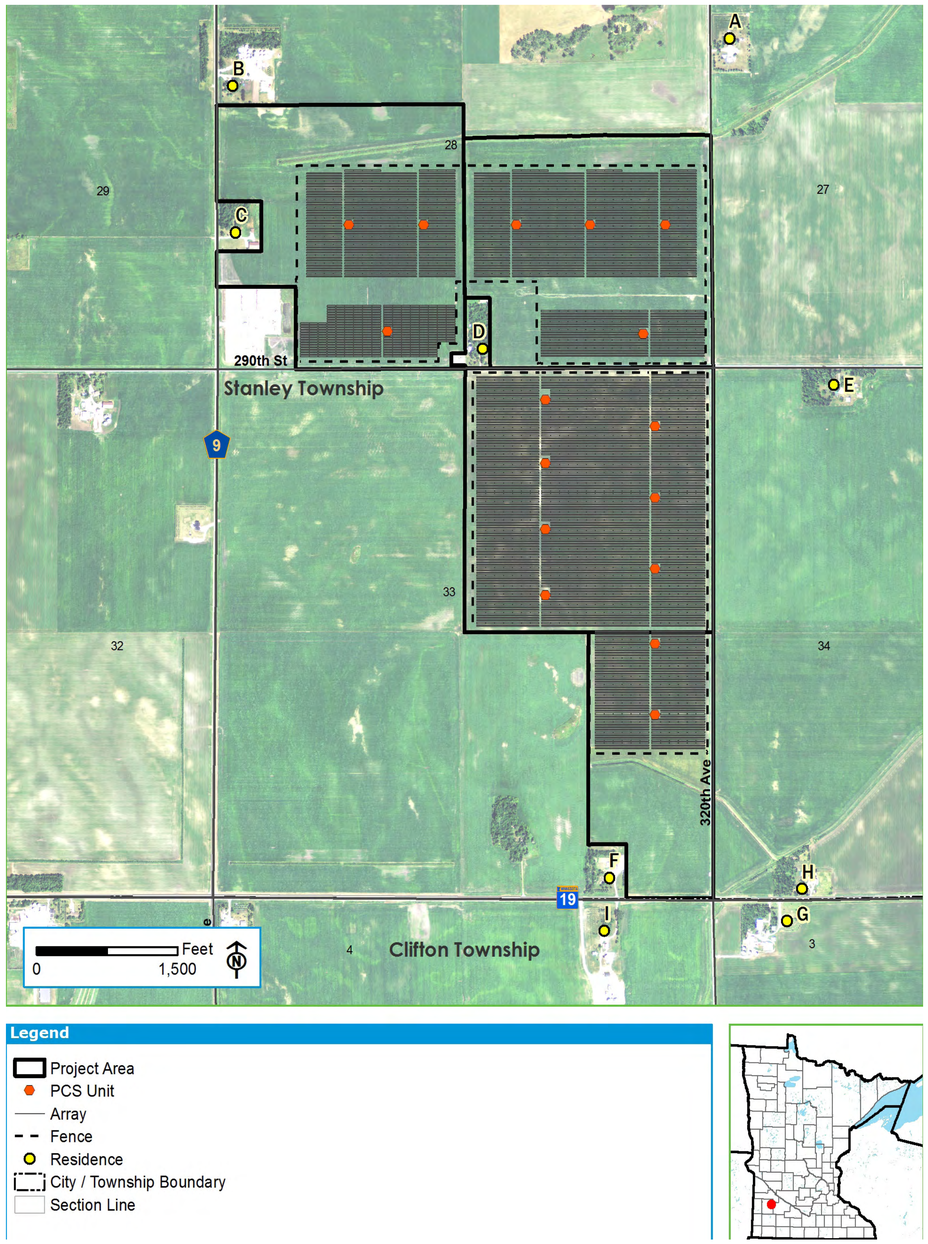
As sunlight hits the solar panels, the solar radiation is converted into direct current (DC) electricity.



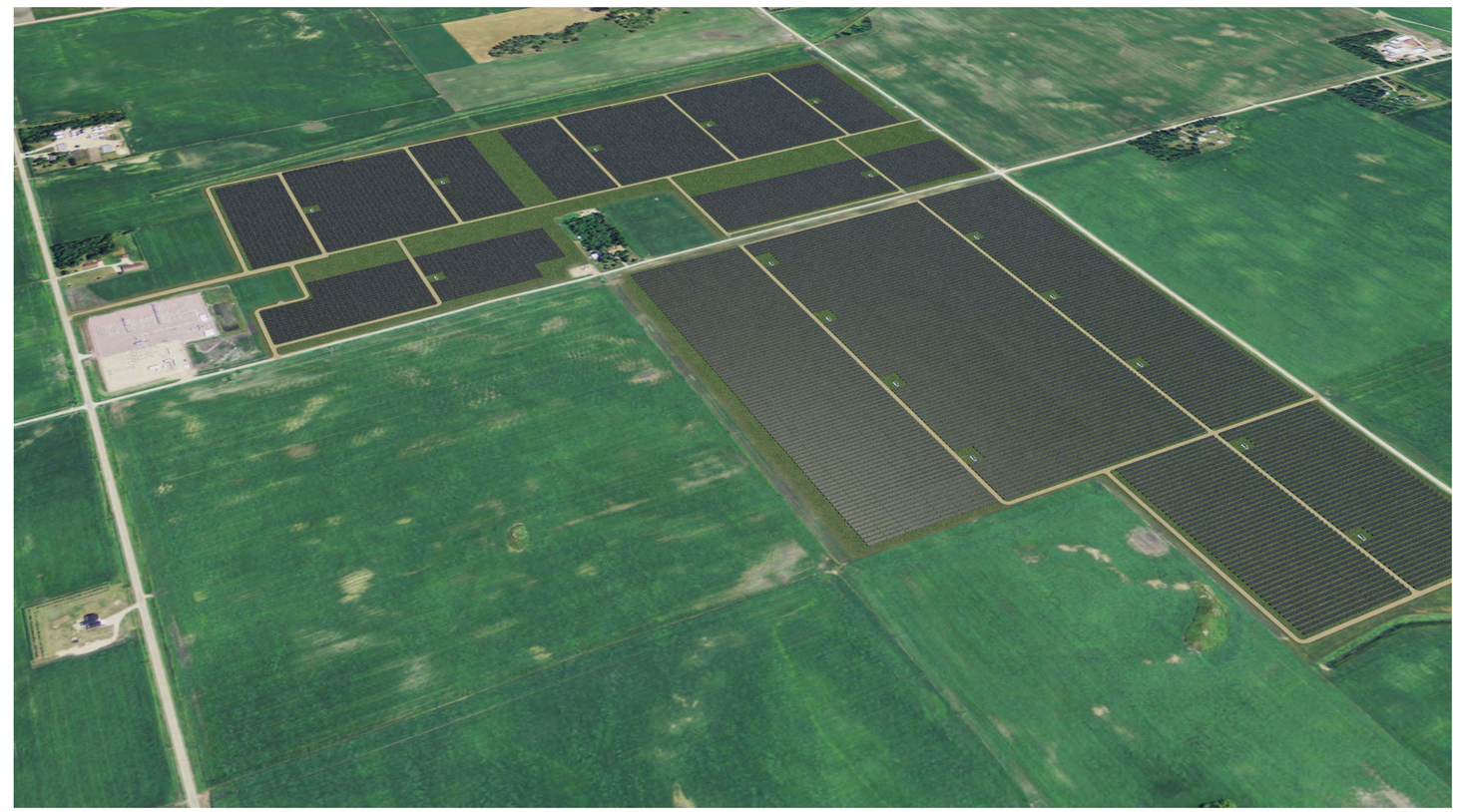
The direct current flows into power inverters, where it is converted into alternating current (AC), which can be used by local electrical utilities.

Finally, the electricity travels through power transformers and the voltage is boosted for delivery onto the transmission grid, where local utilities can distribute the electricity to homes and businesses.

Project Area



Current Aerial Photograph of
Project Location with Site Layout



Visual Simulation of Project Location
During Operation

Photo Simulation #1

Looking East along 290th Street near County Highway 9

Current Conditions

Future Conditions

Photo Simulation #2

Looking West along 320th Avenue between 290th Street and State Highway 19

Current Conditions

Future Conditions

Photo Simulation #3

Looking North along 320th Avenue from State Highway 19

Current Conditions

Future Conditions

Construction Process

1. Site Preparation
2. Posts
3. Tilt Brackets
4. Mounting Structures
5. Module Installation
6. DC Wiring
7. Power Electronics
8. AC Trenching
9. PV Switchgear
10. Substation

Community Involvement

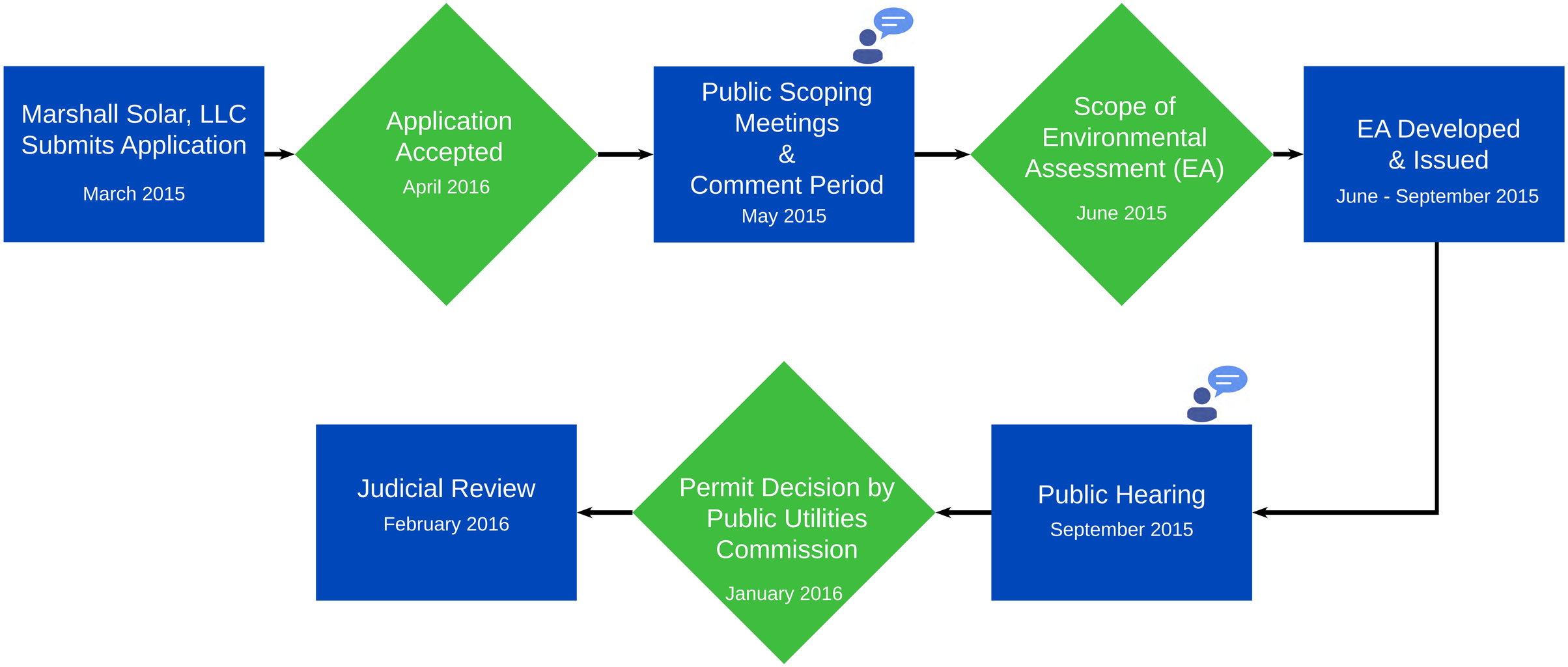
NextEra Energy builds long-term value for its shareholders and delivers affordable, clean and reliable power for our customers. Our investments in clean energy development, economic development and corporate citizenship create opportunities within the communities in which we live and work. Benefits for these stakeholders include:

- Job creation driven by local procurement that drives economic development and reinvestment in local communities;
- Better equipping our next generation through philanthropic investments and support for education; and
- Community development through wellness program support, volunteerism, and fundraising.

NextEra paid more than $492 million in 2013 property taxes to support local law enforcement, fire fighting, and other emergency services, and local schools!

Regulatory Process

The Marshall Solar Project will require a Site Permit under the Alternative Process from the Minnesota Public Utilities Commission/ Department of Commerce.

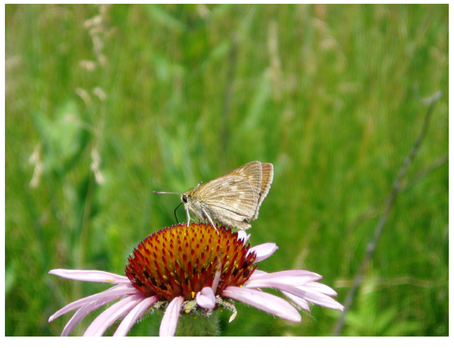


Public Participation Opportunity

Environmental Information

Properly sited solar facilities will have minimal environmental impacts if facilities avoid:

Wetlands	U.S. Army Corps of Engineers concurred with Marshall Solar, LLC that wetlands are not present onsite.
Threatened & Endangered Species	The Minnesota Department of Natural Resources (DNR) does not believe the project will impact special status wildlife. Marshall Solar, LLC will monitor and report any adverse impacts to wildlife after construction.
Critical Habitat	The DNR indicated that the project does not contain any high value wildlife habitat. Marshall Solar, LLC will use a native seed mix post-construction for ground cover and to minimize invasive weeds.
Natural Resource Areas	There are no Natural Resource Areas within or near the project area.
Cultural Resources	The State Historic Preservation Office (SHPO) does not have any cultural resources concerns.



COMMENT FORM

Marshall Solar Energy Project

Thank you for providing feedback on the Marshall Solar Energy Project. Please use the comment form below to submit a comment.

Name: _____

Organization (if any): _____

Mailing Address: _____

_____

City: _____

State: _____ Zip: _____

Phone Number: _____

Email: _____

Please mail this form or email comments to marshallsolarproject@gmail.com by January 30, 2015

Comment: _____

Please fold, fasten, and mail - No envelope necessary

PLACE
POSTAGE
HERE

Marshall Solar Energy Project
HDR Engineering, Inc
701 Xenia Ave S
Suite 600
Minneapolis, MN 55416