*** All present are expected to conduct themselves in accordance with our City's Core Values ***

OFFICIAL NOTICE AND AGENDA

Notice is hereby given that the Solar Array Task Force of the City of Wausau, Wisconsin will hold a regular or special meeting on the date, time and location shown below.

Meeting of the:	**SOLAR ARRAY TASK FORCE**
Date/Time:	**Thursday, July 20, 2023 at 5:00 p.m.**
Location:	**City Hall (407 Grant Street, Wausau WI 54403) - City Council Chambers**
Members:	Chad Henke, John Robinson, Jay Coldwell, Paul Svetlik, Susan Woods

AGENDA ITEMS

1. Approval of Minutes from June 21 meeting.
2. Discussion and possible action on the communication plan and timeline.
3. Discussion and possible action considering solar array locations and size for a solar array near 1801 Burek Ave.
4. Discussion on capital costs and meeting the task force goals of return on investment and potential funding sources.
5. Discussion on the draft Frequently Asked Questions (FAQ's).
   a. Public Comment on the draft FAQ's.
6. Discussion and possible action establishing agenda items for the next meeting.

Signed by Chad Henke, Chairperson

This Notice was posted at City Hall, on the City of Wausau website, and sent to the Daily Herald newsroom on 07/18/23 @ 12:45 PM. Questions regarding this agenda may be directed to the City Clerk.

In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990 (ADA), the City of Wausau will not discriminate against qualified individuals with disabilities on the basis of disability in its services, programs or activities. If you need assistance or reasonable accommodations in participating in this meeting or event due to a disability as defined under the ADA, please call the ADA Coordinator at (715) 261-6622 or ADAServices@ci.wausau.wi.us to discuss your accessibility needs. We ask your request be provided a minimum of 72 hours before the scheduled event or meeting. If a request is made less than 72 hours before the event the City of Wausau will make a good faith effort to accommodate your request.

SOLAR ARRAY TASK FORCE

Date and Time: Wednesday, June 21, 2023, at 5:00 pm, Council Chambers
Members Present: Chad Henke (c), John Robinson, Paul Svetlik, Jay Coldwell
Others Present: Eric Lindman, Tonia Westphal

In accordance with Chapter 19, Wisc. Statutes, notice of this meeting was posted and sent to the Daily Herald in the proper manner. With a quorum present, the meeting was called to order by Chad Henke at 5:00pm.

Roll Call
4 voting members were present.

Approval of Minutes from May 10 Meeting
Motion by Coldwell. Second by Svetlik. Motion passes 4-0.

Educational Presentation by Clark Dietz – Overview of Solar Power

Tonia Westphal of Clark Dietz presented on solar power. *View the presentation in the packet or on the City's YouTube channel at www.youtube.com/watch?v=d6Z7O_ulEaM.*
She discussed:

- Solar panel production, glare, durability
- How to connect solar power energy to the user or the grid
- Opportunity changes with the 2022 Inflation Reduction Act and Wisconsin statute limitations
- Construction, infrastructure, and noise

The committee members asked Westphal follow up questions to her presentation.

To move the process forward to Geotech, Clark Dietz would need to know the:

1. Type of ownership model
2. Identify where will it go and how will it impact the trees.
3. The new plant needs to be studied for actual usage.

Discussion and possible action on solar power and the City of Wausau vision

Lindman explained they discussed the concerns and goals of the previous meeting and are also thinking of the goals of the city. From the utility side, they want to look at the benefits for all rate payers, current and future. Want to make sure that we have built in redundancies. It has been discussed, to have citywide education (e.g., website, surveys). Coldwell is interested in the public education and surveys to get input to share back with the community. Svetlik noted that the public information meetings that were held in 2022 were well attended. Robinson added that they needed to be tied into a report or solicitation of input to be valuable. Could follow the DOT model and present schematics and have people there to collect feedback at the right time of the process. Coldwell noted that the lifetime of the task force is 1 year, so have a midpoint and ¾ way through the process to gather some public feedback.

Henke asked if the committee had an ownership type, they liked. Westphal noted to design how large of a facility you need based on your power needs. If you generate more power than would use, would negotiate with Wisconsin Public Service to generate a rate. If tie in, enter into an agreement where they would sell back to the utility. Life of system and ROI is something the task force would have to look at. Robinson stated he wanted to look at the entire site to do due diligence. Start by looking at aerials, costs and benefits. Svetlik asked if the task force could look at rooftop solar panels. Westphal asked what a budget would look like for this project. Coldwell stated having a big picture goal in mind on return on investment or % less than current electric bill, etc. The task force was in favor of 10-year ROI for a budget.

Discussion and possible action addressing goals and questions for the Solar Array Task Force from the May 10 meeting.

Want to develop a schedule for public engagement. Lindman stated the property was originally platted with streets. Right now, it is zoned residential for 10-12 lots. Anything else would need to be rezoned. Svetlik mentioned a

survey for public input on a potential walking path. Discussion on engaging NTC to create an apprenticeship program. Coldwell stated it made sense to think about how could incorporate storage in the project but implementing it would most likely be in phase 2. He also stated that the net carbon impact over the life of the project would be great in the public information phase. Svetlik questioned the 30 years life expectancy of the panels. Westphal stated you could keep using the existing frame but would expect to replace the panels.

Discussion and possible action establishing agenda items for the next meeting.

- Robinson and Lindman will have a draft plan for public engagement for the next meeting.
- Lindman can provide baseline information on the current plant power, and projections with GAC system implemented (currently costs $40,000 per month)
- Site plan evaluation (aerials, map with test sites that are not feasible)
- Update from Clark Dietz (information on the Inflation Reduction Act, estimate of project to achieve ROI)

The next meeting will be Thursday, July 20 at 5:00pm.

Adjourn

Motion by Robinson, second by Coldwell to adjourn the meeting. Motion carried unanimously. Meeting adjourned at 6:27pm.

Solar Array Task Force

Communication Plan & Timelines

Background

Develop background information on:

- Overview of Solar Power
- Environmental Factors including noise and appearance.
- How effective are systems?
- What is the life cycle of the system?
- What funding is available
- How much energy can be generated by area (acre)

Current Utility Needs

- What is the current energy need for the utility (KWH)
- How much of the need could be met with solar energy?
- At what cost? Impact on rate payer.
- What savings could be realized by the utility
- What size would the system need to be?

Hold public informational meeting Fall 2023

Developing conceptual options

- Solar Array
  - Size
  - Configuration
  - Location
  - Design
- Potential locations
  - Setbacks/Berming
- Do Nothing
  - Disposition of property

Gather public input on range of options (December 2023)

Evaluate options

Evaluation Options

- Long Term Effectiveness
- Short Term Effectiveness
  - Impact on Neighborhood
- Implementability
  - Ability to construct and operate the system
  - Reliability of the technology
  - Ability to monitor the effectiveness of the system
  - Availability of Services and materials
- Costs
  - Short Term
  - Long Term
  - Present value
  - Funding
- Community acceptance

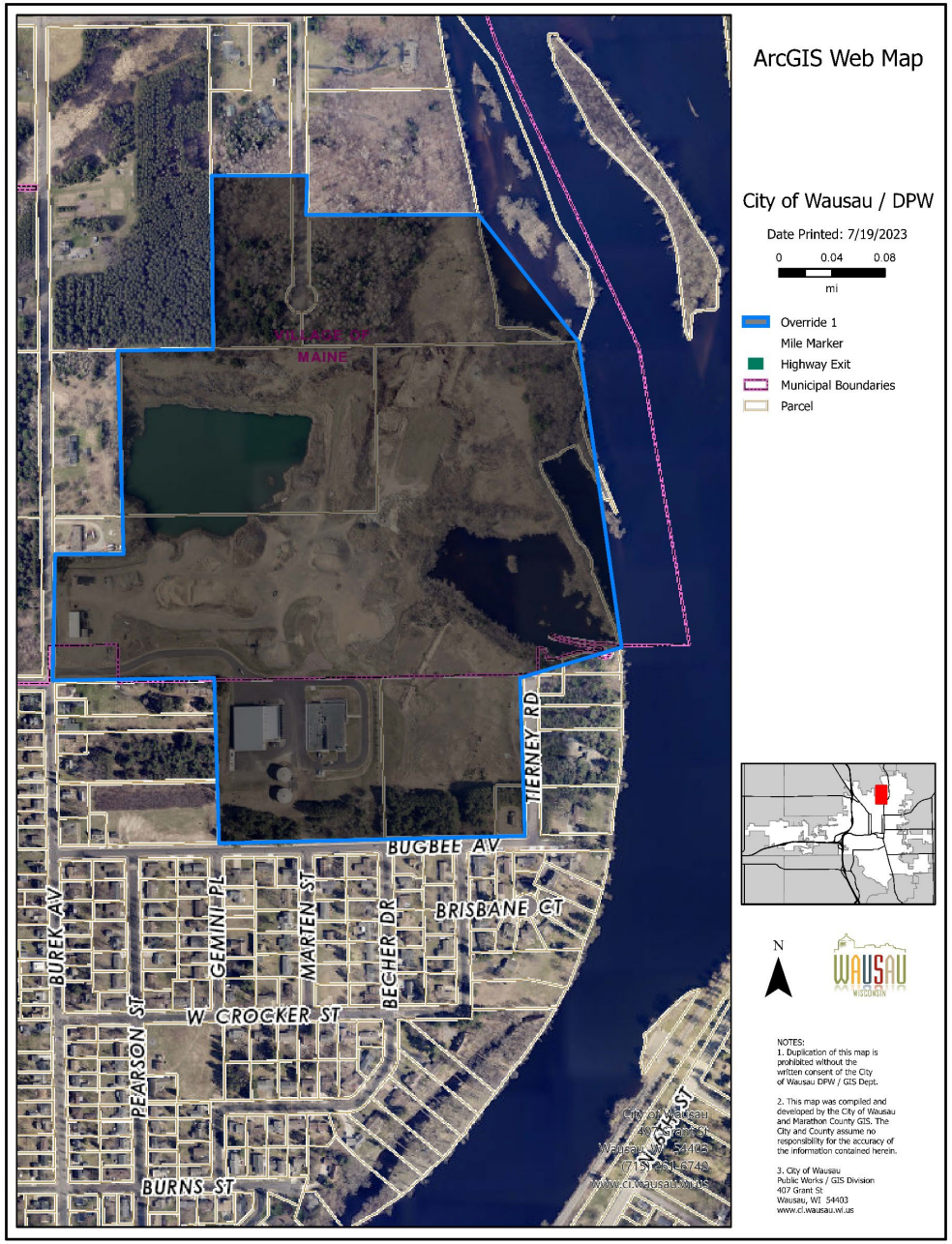
Public meeting and comment period (Early 2024)

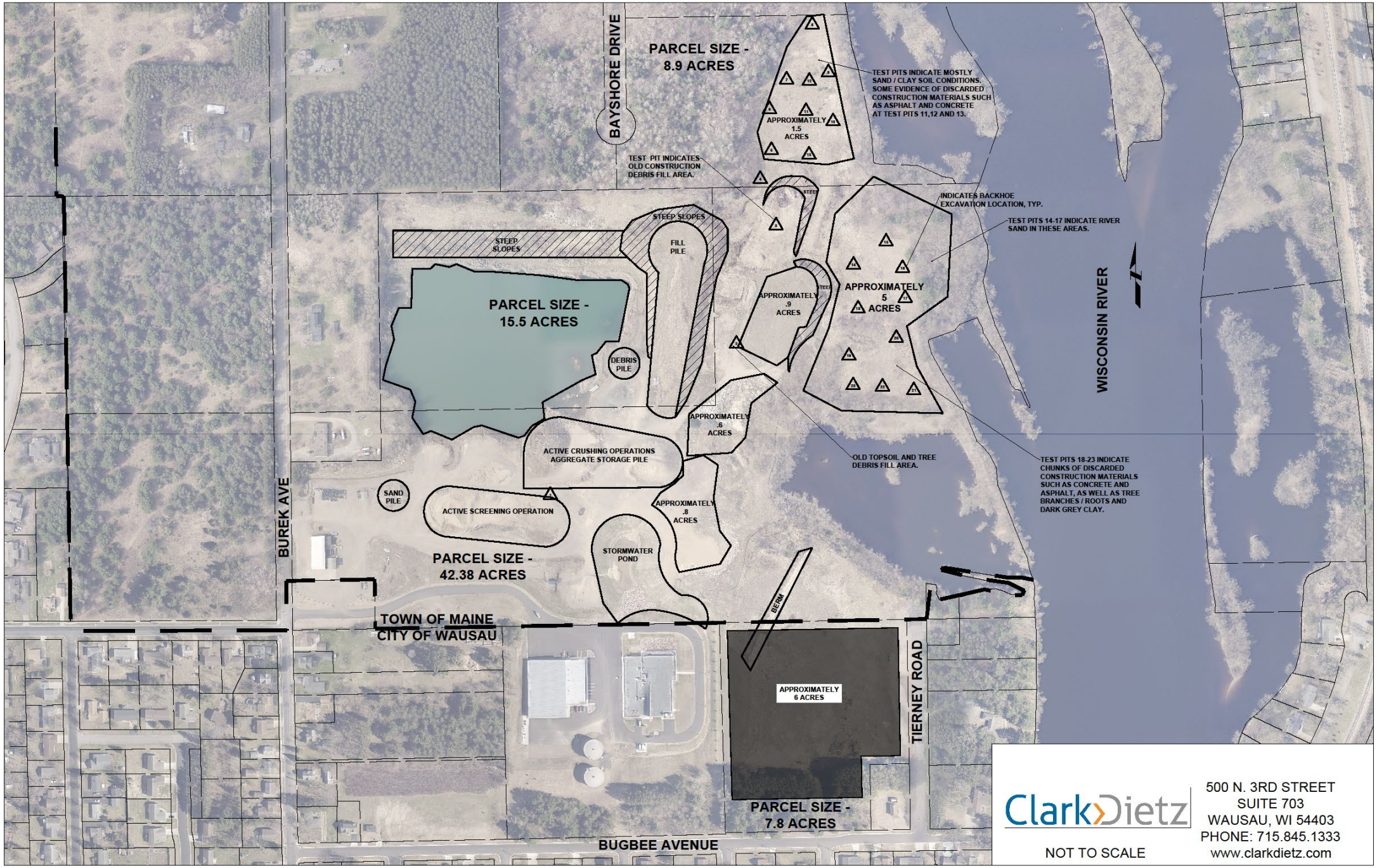
Develop Recommendations for Utility and City Council

Solar Array Task Force
Property Information
Possible Solar Options

July 20, 2023

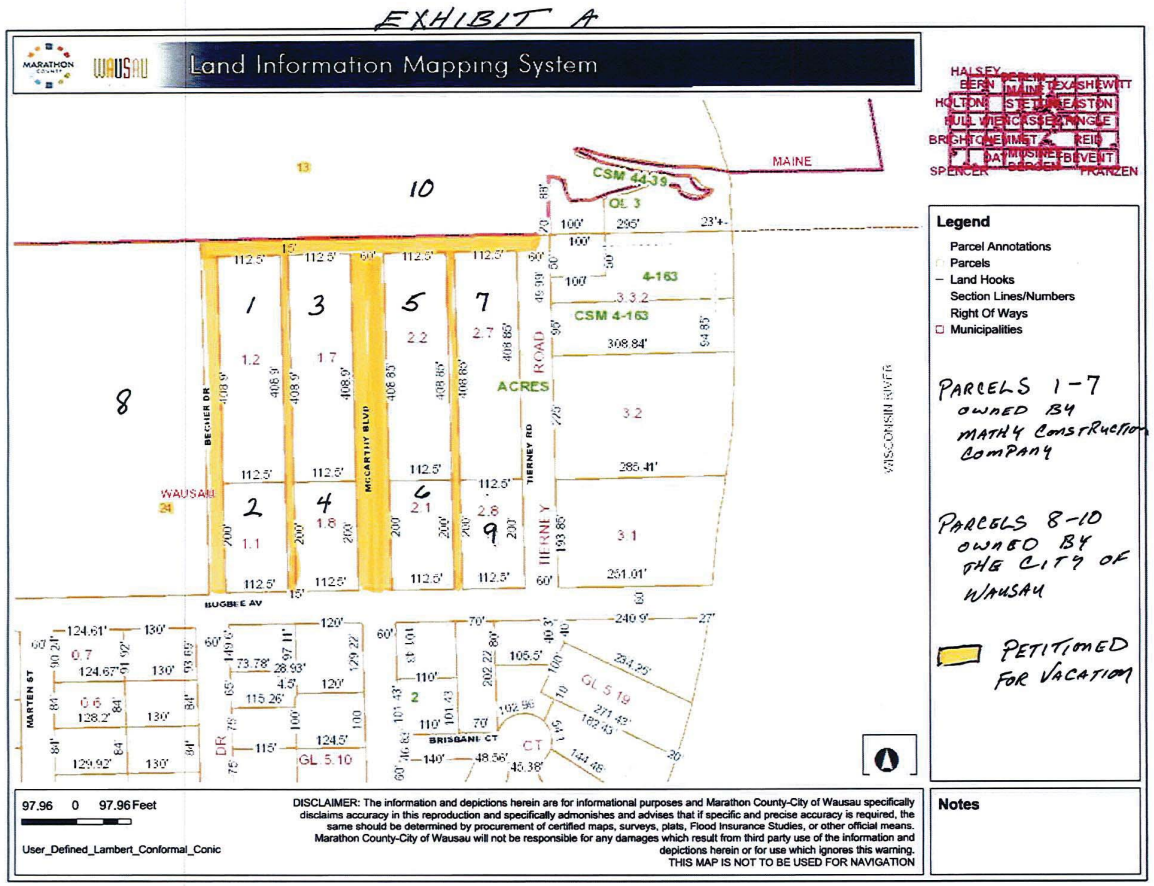
Property Owned by City

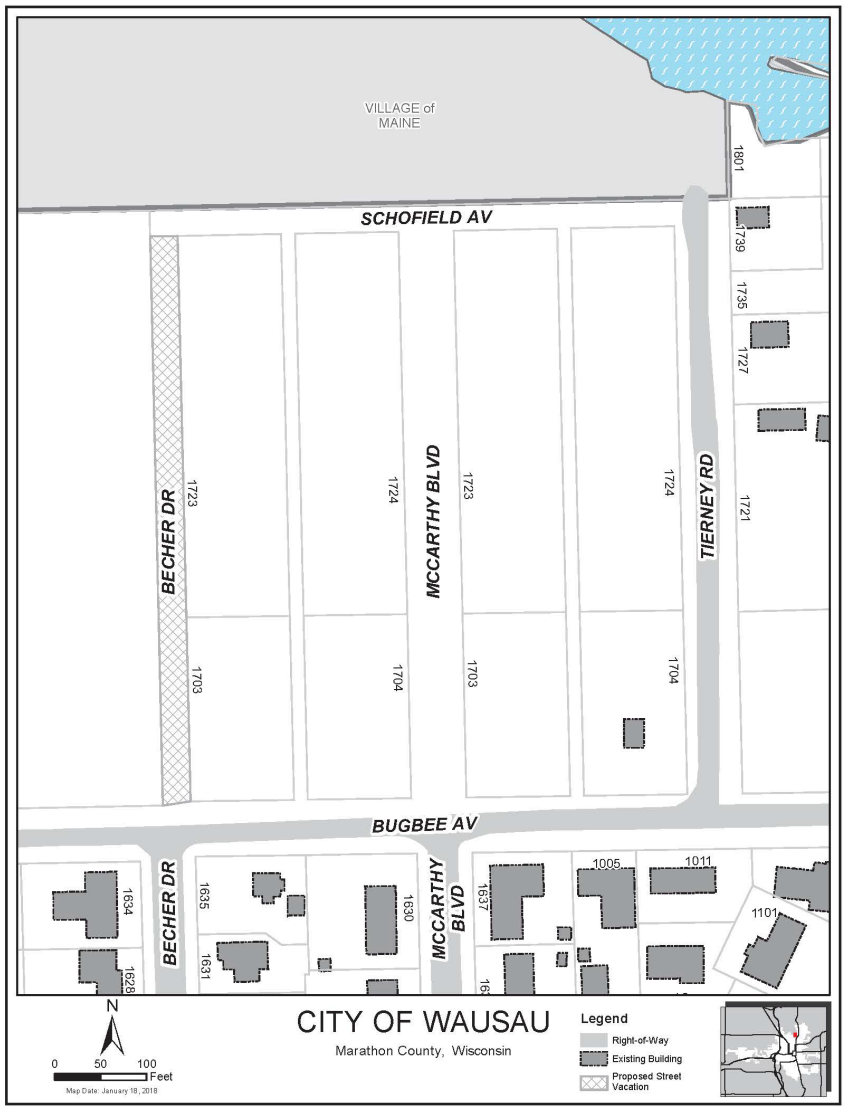




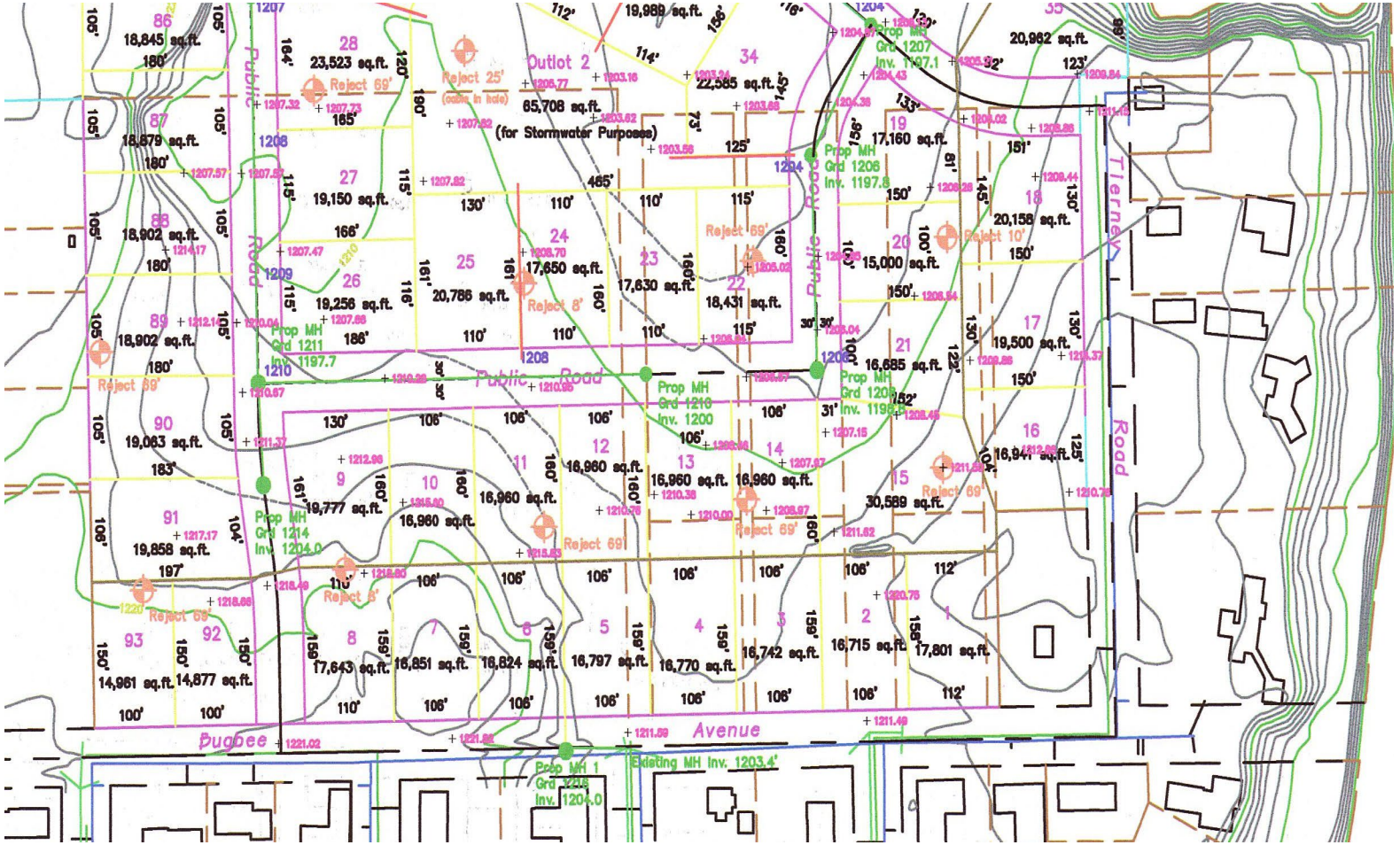
ClarkDietz
500 N. 3RD STREET
SUITE 703
WAUSAU, WI 54403
PHONE: 715.845.1333
www.clarkdietz.com

Previous Street/Alley Vacations uses of Property





Previous Plat Prepared Use of the Property- 2009



Design 1 City of Wausau - Drinking Water Treatment Facility, 700 Bugbee Ave, Wausau, WI 54401

Report

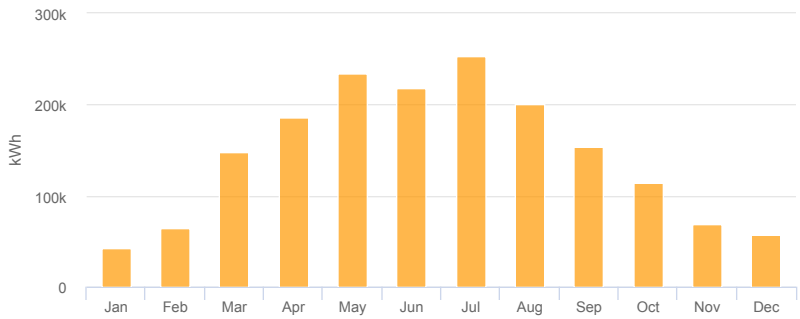
Project Name	City of Wausau - Drinking Water Treatment Facility
Project Address	700 Bugbee Ave, Wausau, WI 54401
Prepared By	Dan Fairbank danf@sunvest.com

System Metrics

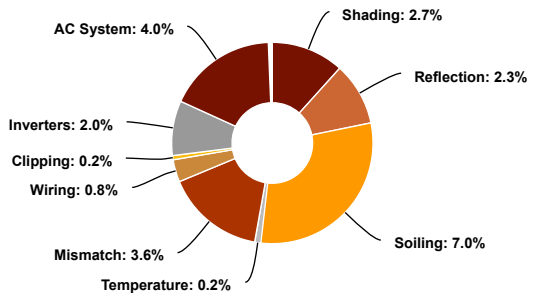
Design	Design 1
Module DC Nameplate	1.25 MW
Inverter AC Nameplate	1.02 MW Load Ratio: 1.23
Annual Production	1.739 GWh
Performance Ratio	79.4%
kWh/kWp	1,387.7
Weather Dataset	TMY, 10km Grid (44.95,-89.65), NREL (prospector)
Simulator Version	d77b2da138-a66f2f7d0d-27025c7766-f1720428f8

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,333.7	
	POA Irradiance	1,747.8	31.1%
	Shaded Irradiance	1,701.3	-2.7%
	Irradiance after Reflection	1,662.2	-2.3%
	Irradiance after Soiling	1,546.1	-7.0%
	Total Collector Irradiance	**1,546.1**	**0.0%**
Energy (kWh)	Nameplate	1,938,616.8	
	Output at Irradiance Levels	1,941,413.0	0.1%
	Output at Cell Temperature Derate	1,936,947.9	-0.2%
	Output After Mismatch	1,866,743.5	-3.6%
	Optimal DC Output	1,851,452.8	-0.8%
	Constrained DC Output	1,848,603.8	-0.2%
	Inverter Output	1,811,571.5	-2.0%
	Energy to Grid	**1,739,108.6**	**-4.0%**
Temperature Metrics			
	Avg. Operating Ambient Temp		8.3 °C
	Avg. Operating Cell Temp		15.5 °C
Simulation Metrics			
	Operating Hours		4704
	Solved Hours		4704

Condition Set

Description	Condition Set 1											
Weather Dataset	TMY, 10km Grid (44.95,-89.65), NREL (prospector)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	Rack Type	a	b	Temperature Delta								
	Fixed Tilt	-3.56	-0.075	3°C								
	Flush Mount	-2.81	-0.0455	0°C								
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	41	30	10	3	3	3	3	5	5	3	3	16
Irradiation Variance	5%											
Cell Temperature Spread	4° C											
Module Binning Range	-2.5% to 2.5%											
AC System Derate	4.00%											
Trackers	Maximum Angle	Backtracking										
	60°	Enabled										
Module Characterizations	Module	Uploaded By	Characterization									
	CS7N-650MS (CSI Solar Co., Ltd.)	HelioScope	CS7N-650MS_CSI_EXT_V7_10_20210315.PAN, PAN									
Component Characterizations	Device	Uploaded By	Characterization									
	XGI 1000-60/60 (Solectria)	HelioScope	Spec Sheet									

Components

Component	Name	Count
Inverters	XGI 1000-60/60 (Solectria)	17 (1.02 MW)
Strings	10 AWG (Copper)	102 (23,994.9 ft)
Module	CSI Solar Co., Ltd., CS7N-650MS (650W)	1,928 (1.25 MW)

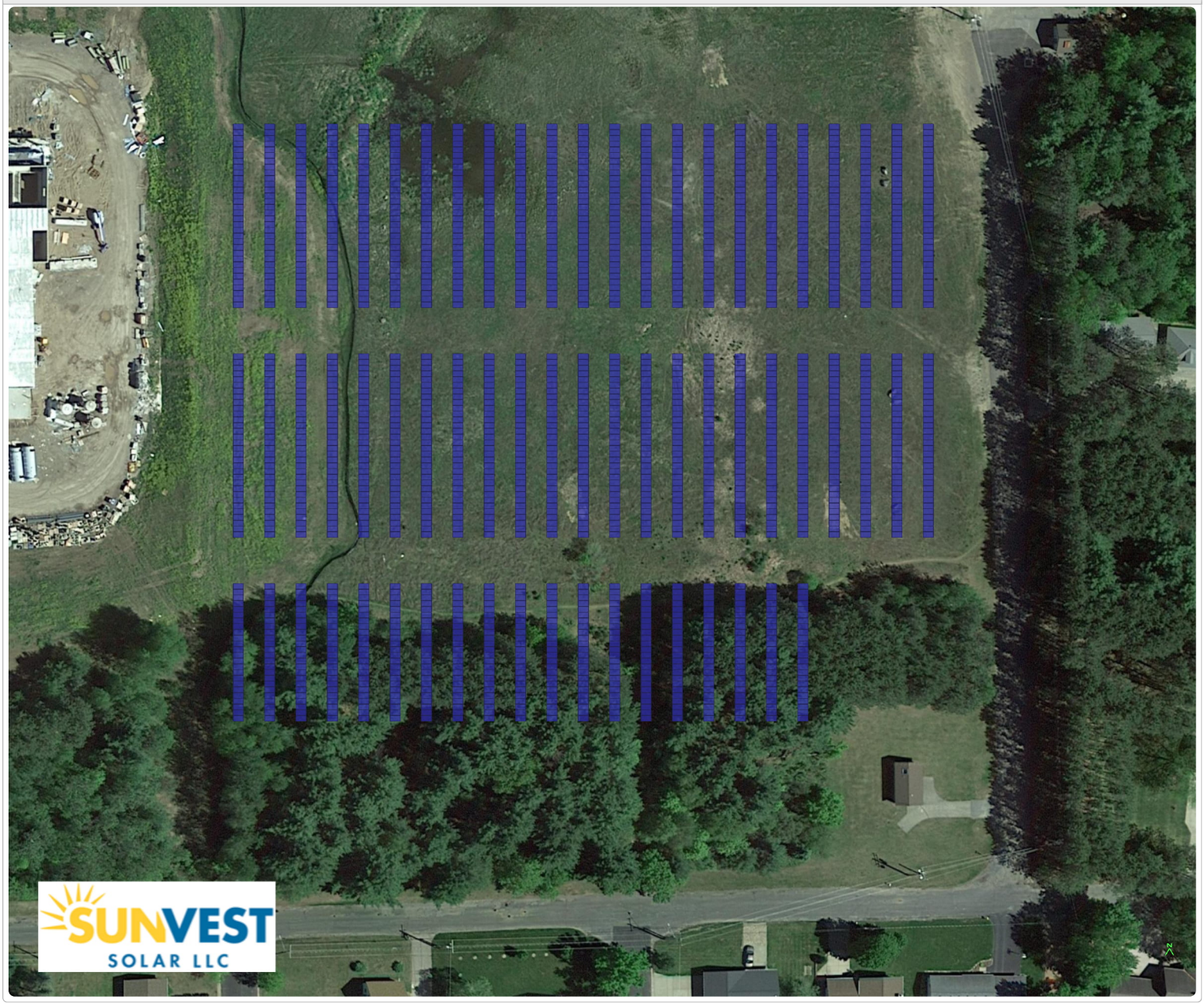
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	16-19	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Single-axis Trackers (N/S)	Portrait (Vertical)	25°	180°	16.0 ft	1x8	241	1,928	1.25 MW

Detailed Layout



SAT City of Wausau - Drinking Water Treatment Facility, 700 Bugbee Ave, Wausau, WI 54401

Report

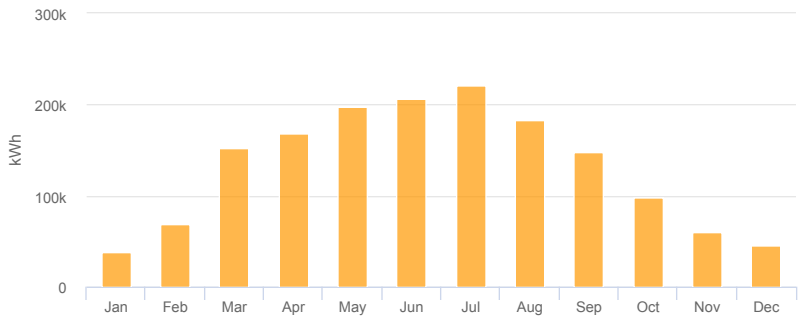
Project Name	City of Wausau - Drinking Water Treatment Facility
Project Address	700 Bugbee Ave, Wausau, WI 54401
Prepared By	Dan Fairbank danf@sunvest.com

System Metrics

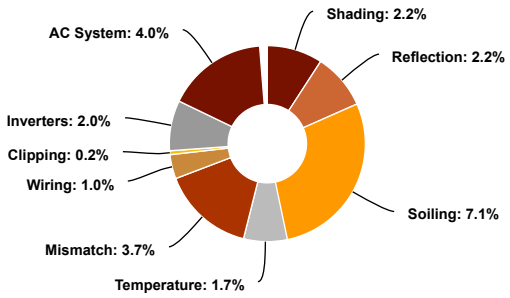
Design	SAT
Module DC Nameplate	1.03 MW
Inverter AC Nameplate	840.0 kW Load Ratio: 1.23
Annual Production	1.586 GWh
Performance Ratio	78.5%
kWh/kWp	1,532.6
Weather Dataset	TMY, 0.04° Grid (44.97,-89.62), NREL (psm3)
Simulator Version	d77b2da138-a66f2f7d0d-27025c7766-f1720428f8

Project Location

Monthly Production



Sources of System Loss



Annual Production

	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,436.3	
	POA Irradiance	1,953.5	36.0%
	Shaded Irradiance	1,910.3	-2.2%
	Irradiance after Reflection	1,867.8	-2.2%
	Irradiance after Soiling	1,734.6	-7.1%
	Total Collector Irradiance	**1,734.6**	**0.0%**
Energy (kWh)	Nameplate	1,795,997.7	
	Output at Irradiance Levels	1,801,427.0	0.3%
	Output at Cell Temperature Derate	1,770,114.2	-1.7%
	Output After Mismatch	1,704,817.0	-3.7%
	Optimal DC Output	1,688,450.5	-1.0%
	Constrained DC Output	1,685,824.8	-0.2%
	Inverter Output	1,652,052.4	-2.0%
	Energy to Grid	**1,585,970.2**	**-4.0%**
Temperature Metrics			
	Avg. Operating Ambient Temp		10.1 °C
	Avg. Operating Cell Temp		20.0 °C
Simulation Metrics			
	Operating Hours		4307
	Solved Hours		4307

Condition Set

Description	Condition Set 2											
Weather Dataset	TMY, 0.04° Grid (44.97,-89.62), NREL (psm3)											
Solar Angle Location	Meteo Lat/Lng											
Transposition Model	Perez Model											
Temperature Model	Sandia Model											
Temperature Model Parameters	Rack Type	a	b	Temperature Delta								
	Fixed Tilt	-3.56	-0.075	3°C								
	Flush Mount	-2.81	-0.0455	0°C								
	East-West	-3.56	-0.075	3°C								
	Carport	-3.56	-0.075	3°C								
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D
	41	30	10	3	3	3	3	5	5	3	3	16
Irradiation Variance	5%											
Cell Temperature Spread	4° C											
Module Binning Range	-2.5% to 2.5%											
AC System Derate	4.00%											
Trackers	Maximum Angle			Backtracking								
	60°			Enabled								
Module Characterizations	Module	Uploaded By	Characterization									
	CS7N-650MS (CSI Solar Co., Ltd.)	HelioScope	CS7N-650MS_CSI_EXT_V7_10_20210315.PAN, PAN									
Component Characterizations	Device	Uploaded By	Characterization									
	XGI 1000-60/60 (Solectria)	HelioScope	Spec Sheet									

Components

Component	Name	Count
Inverters	XGI 1000-60/60 (Solectria)	14 (840.0 kW)
Strings	10 AWG (Copper)	84 (25,172.7 ft)
Module	CSI Solar Co., Ltd., CS7N-650MS (650W)	1,592 (1.03 MW)

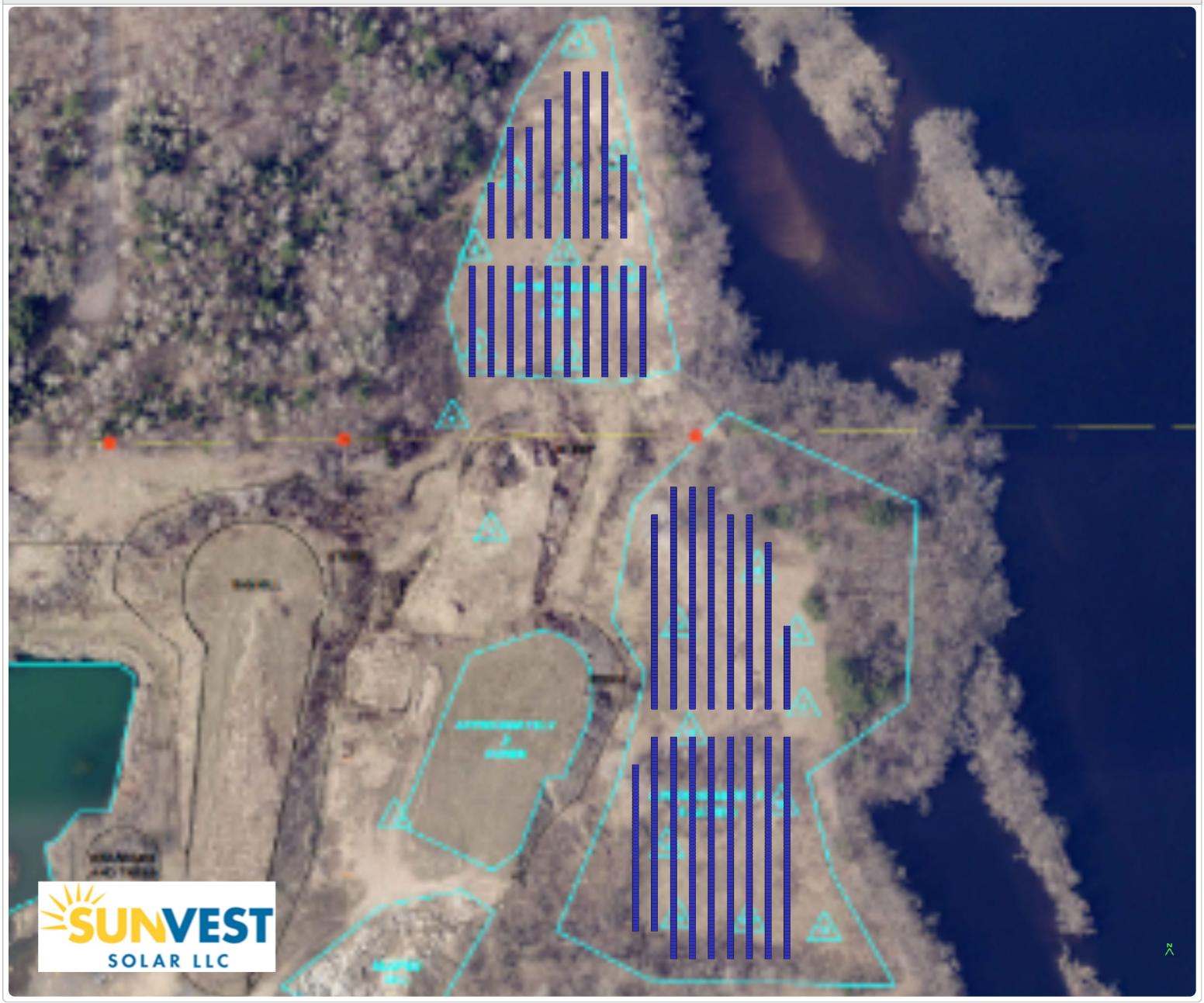
Wiring Zones

Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	16-19	Along Racking

Field Segments

Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Single-axis Trackers (N/S)	Portrait (Vertical)	25°	180°	16.0 ft	1x8	76	608	395.2 kW
Field Segment 2	Single-axis Trackers (N/S)	Portrait (Vertical)	25°	180°	16.0 ft	1x8	123	984	639.6 kW
Field Segment 3	Fixed Tilt	Portrait (Vertical)	25°	180°	20.1 ft	2x8			0

Detailed Layout



ClarkDietz

Engineering Quality of Life®

Frequently Asked Questions with Answers and Sources

- What happens to the value of my property?
  - A study conducted across Illinois determined that the value of properties within one mile increased by an average of 2 percent after the installation of a solar farm.
  - An examination of 5 counties in Indiana indicated that upon completion of a solar farm, properties within 2 miles were an average of 2 percent more valuable compared to their value prior to installation.2
  - An appraisal study spanning from North Carolina to Tennessee shows that properties adjoining solar farms match the value of similar properties that do not adjoin solar farms within 1 percent.
    - Source:
      - Solar Property Value FactSheet 2019-PRINT_1.pdf (seia.org)
- How noisy is a solar farm?
  - Solar projects are effectively silent. Tracking motors and inverters may produce an ambient hum that is not typically audible from outside the enclosure.
    - Source:
      - Solar Property Value FactSheet 2019-PRINT_1.pdf (seia.org)
- How much electricity does the new plant use?
  - In the month of May 2023, the new plant used 163.976 MWH with an average of 4.969 MWH per day.
  - In the month of April 2023, the new plant used 140.25 MWH with an average of 4.836 MWH per day.
    - Source: The plant's electricity bill
- Will there be increased traffic?
  - Solar projects do not attract high volumes of additional traffic as they do not require frequent maintenance after installation.
    - Source:
      - Solar Property Value FactSheet 2019-PRINT_1.pdf (seia.org)
- How tall are solar panels?
  - Maximum of 15 feet
    - Source:
      - WI-Solar-Ordinance-2020.pdf (growsolar.org)

Frequently Asked Questions with Answers and Sources Continued

- Solar panel maintenance of snow, dirt, or dust?
    - The dark silicone cells of solar panels are designed to absorb heat from sunlight. Once any portion of a panel is exposed to the sun, a small amount of heat spreads throughout the panel and melts the snow. You see this same effect with a blacktop driveway, once a hole in the snow becomes exposed to the sun, it quickly grows. Other weather like rain clears off any dirt or dust that the solar array accumulates.
    - Tracking solar panels have even less snow that accumulates since it moves and the snow that it accumulates slides off due to gravity.
        - Sources:
            - Here's Why You Don't Have To Worry About Snow On Solar Panels This Winter | Simpleray Solar
            - How Do Tracker Mounted Solar Panels Perform in Snow? - Solaflect
- Do solar panels cause glare?
    - No Solar panels are built to absorb the sun's light and energy it would cause as much glare as a blacktop driveway.
        - Sources:
            - Here's Why You Don't Have To Worry About Snow On Solar Panels This Winter | Simpleray Solar
            - How Do Tracker Mounted Solar Panels Perform in Snow? - Solaflect
- Where are solar panels made?
    - 74% of the world's solar panels production is in China.
        - Source:
            - Solar Power by Country 2023 (worldpopulationreview.com)
- How weather resistant are solar panels?
    - Solar panels are extremely weather resistant, being able to withstand winds up to 160mph and hail no problem.
        - Source:
            - How weather resistant are solar panels - SolarPowerGenie.com
- What is the lifespan of a solar panel?
    - Around 30 years is when they should be replaced.
        - Source:
            - How Long do Solar Panels Last? Solar Panel Lifespan 101 | EnergySage

Frequently Asked Questions with Answers and Sources Continued

- Why is it better to have the array close to a major consumer?
  - If the array is not directly hooked up to the major consumer it must be sold to the utility company at a significantly lower rate.
    - Source:
      - PSC Customer-Owned Electrical Generation (wi.gov)
- What is the ROI of a solar power plant?
  - Between 5 – 15 years.
    - Source:
      - What Is the Solar Farm Return on Investment? (angi.com)
- Will construction take a long time?
  - It takes a relatively short time for an array to be built since the panels are pre-built in the factory. The only lengthy part is landscaping and installing the racking for the panels.
    - Source:
      - How Long do Commercial Solar Projects Take? | EnergyLink (goenergylink.com)
- What types of materials are solar panels made of?
  - The one in the solar plant would be monocrystalline since it provides the highest efficiency.
    - Source:
      - Monocrystalline solar panels vs. polycrystalline solar panels: Find out which ones are right for you - CNET
- Can solar panels be recycled?
  - Yes, solar panels can be recycled through the installer or a 3rd party.
    - Source:
      - Utility-Scale Solar Panel Decommissioning – We Recycle Solar
- Are there tax incentives for solar energy?
  - Yes, the Inflation Reduction Act states that for a utility solar power plant 30% of the tax-exempt debt will be given as a tax credit.
    - Source:
      - FACT SHEET: Inflation Reduction Act Advances Environmental Justice | The White House
- How much power can solar produce in WI?
  - 15.5 – 46.5 kWh of energy each month per panel.
    - Source:
      - Average Solar Production In Wisconsin USA - Shrink That Footprint